THE CANADIAN THRESHERMAN AND FARMER

CANADA'S FARM MACHINERY MAGAZINE

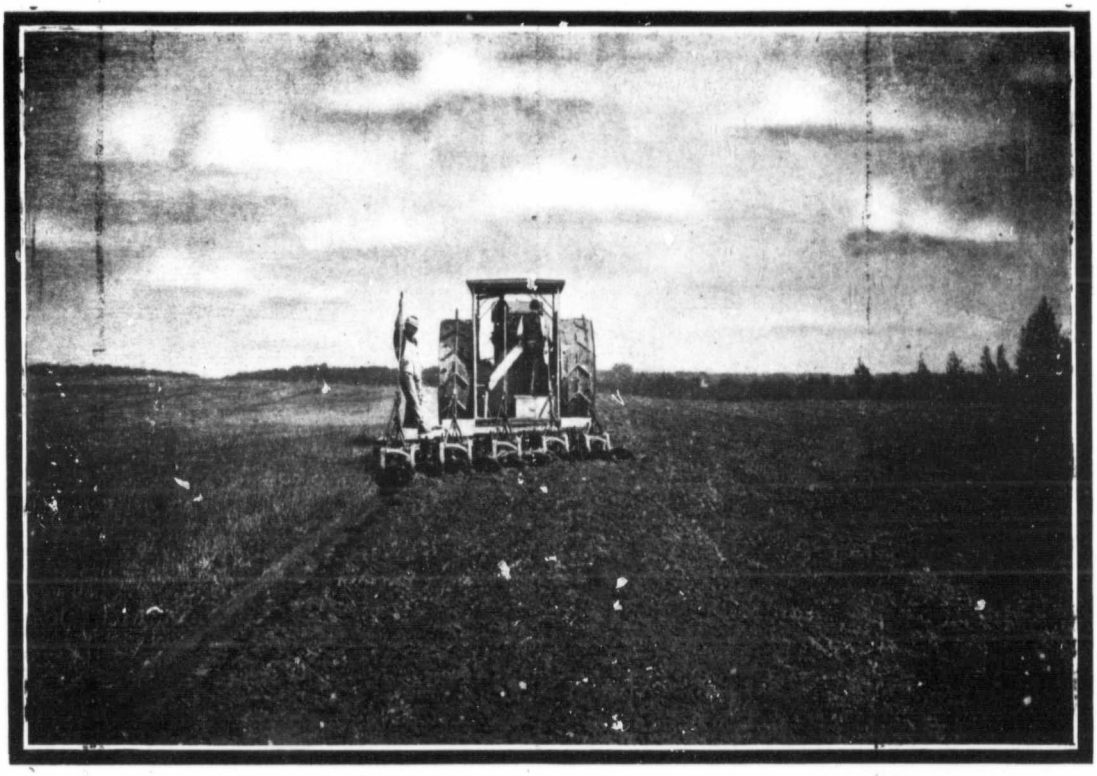
WINNIPEG CANADA

MAY - 1910

E.H. Heath Company Limited Publishers

JOHN DEERE ENGINE GANGS

4, 6, 8, 10, 12 AND 14 BOTTOMS



BIG PLOWS for a BIG COUNTRY

Why turn a Single Furrow when you can turn from 4 to 14 furrows at the same time

Canada is a country of big farms, big possibilities and big profits—if you are a big farmer.

A general couldn't fight much of a battle with one soldier, and a farmer can't raise much wheat with a one-furrow plow.

Get the Right Gang

Bottoms in pairs give great strength and make the plows run steady. The beams can be braced and each plow steadies the other. You notice these features on a two-bottom horse gang—you can't beat that construction.

Don't Clog

Curved frames give great clearance, and the JOHN DEERE Engine Gang will go through straw, trash, weeds and scrub where other gangs clog and cause trouble.

Screw Clevis

In addition to the regular clevis adjustment, each beam is fitted with a screw clevis when attached to the frame. A man can stand on the platform and adjust any one plow with a wrench while the engine and gang are working. This saves time and is a most important feature.

Works with Coulters

Rolling Coulters can be used on the JOHN DEERE Engine Gang just the same as on a sulky plow

Level Platform

The platform is roomy, free from obstructions and so arranged that the levers are all in reach.

Standard Sizes

4 or 6 Plows on One Frame 6 or 8 Plows on One Frame
10 or 12 Plows on One Frame

Extension can be furnished for the 12 bottom frame allowing two more plows to be used; making 14.

ILLUSTRATED BOOKLET FREE

Write us to-day for Free Booklet showing JOHN DEERE Gangs being used with all kinds of steam, oil and gasoline tractors. Don't fail to get this book and learn all about engine plowing. A post card will bring the book. Mention this paper when you write.

John Deere Plow Company, Limited

Winnipeg Regina Calgary Saskatoon Edmonton

LIGHT DRAFT
JOHN DEERE GANG PLOW

HOW TO SELECT A PLOW---THE RULE OF FOUR

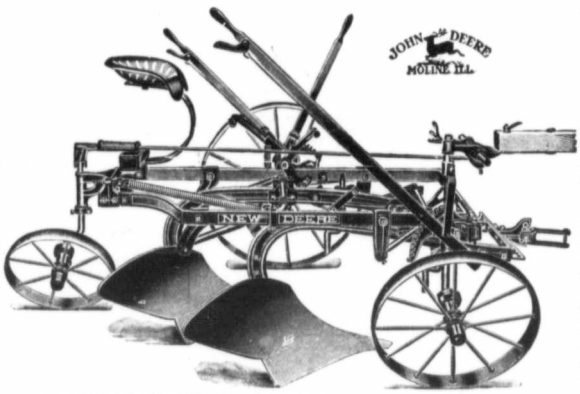
Plow quality does not improve with age.

An inferior plow does poorer work, is harder to pull, and costs more for repairs every year it is in use.

Because certain things about a plow cannot be changed for the better **after** you buy it, care and study **before** buying, is important.

Judging the real worth of a plow is not difficult if four things are kept in mind:

First—Quality of work.
Second—Ease of management.
Third—Lightness of draft.
Fourth—Strength and durability.



THE LIGHT DRAFT NEW DEERE—WHY IT PULLS EASY

WHY THESE FOUR QUALITIES ARE THE TEST

First—Nothing takes the place of good work. Unless a plow does perfect work you cannot afford to own it, no matter what the price.

Second—Have regard for your own comfort—that pays. Get a plow that is easy to ride, and that can be operated with little effort on your part.

Third—Never work horses harder than necessary. Horseflesh and horse-feed cost money. An extra one-eighth horse power added to the draft will cost you the price of a plow—very soon.

Fourth—Repairs are expensive. A good plow lasts longer than a poor one.

Consider five things when judging the draft of a plow:

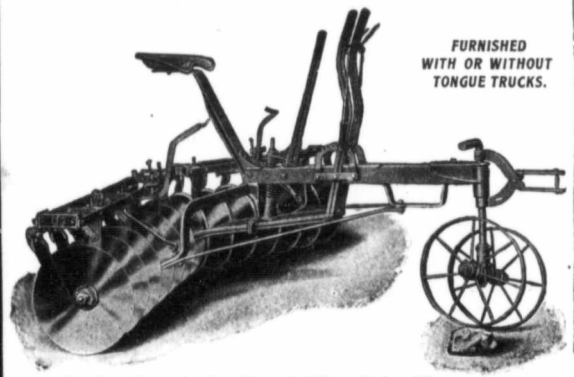
First—The shape of the bottom. **Second**—Material out of which it is made. **Third**—Equal weight on all the wheels.
Fourth—Proper adjustments. **Fifth**—Staunchness of the plow.

Write for Literature, Prices and Terms.

JOHN DEERE PLOW COMPANY LIMITED

CALGARY REGINA **WINNIPEG** EDMONTON SASKATOON

Deere Model B Disc Harrow

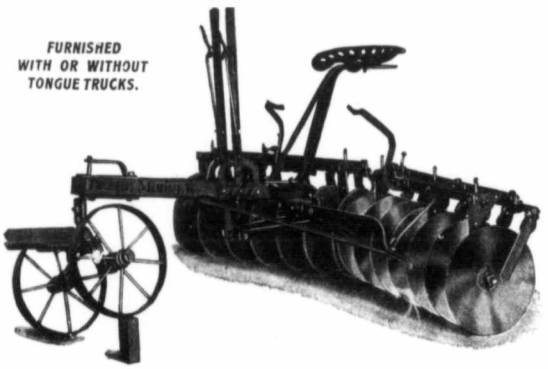


It is the Only Real Flexible Harrow.

PROGRESSIVE Farmers know how much more satisfactory our **Model "B" Disc Harrow** does **its work** of **pulverizing** the soil **evenly**—without skipping rough places in the "middle"—because our **Third Lever** with **Spring Pressure Yoke** and **coutrolled** draw bars, enables you to **govern** your disc, They can't push up in centre, as with ordinary machines. You pull the lever and it locks automatically with discs **working** through dead furrows or over ridges always cultivating **thoroughly.** Special features besides superior malleable iron parts and **extra durable construction,** are: Easy, Double-Spring Seat—High Frame out of dust—Adjustable Disc Scrapers—Lighter Draft, etc.

Write for Catalogue.

Deere Model K Disc Harrow



A STRONG substantial two-lever harrow, slightly lighter than Model "B," but having many of its points of superiority. **The Frame** is made from a single piece of heavy steel. The frame bars, crosstrees and braces are all steel, very securely reveted and bolted together.

The Scrapers are of the improved oscillating style, and can be easily removed or replaced. **Hard Maple** oil-soaked **bearings** are used on this harrow. **Disc Blades** are made of the every best quality steel, thoroughly polished and sharpened. Double **Angling Levers** on this barrow ensure a convenient machine for lapping lands and for hillside work.

Write for Catalogue.

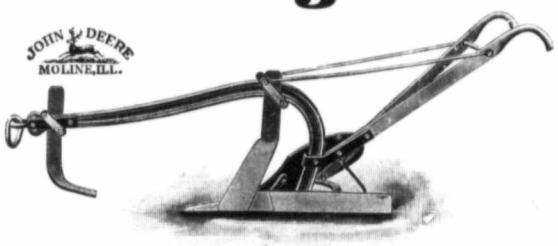
Both of the above styles of Disc Harrows are excellent Tools to pull behind a John Deere Engine Gang.

JOHN DEERE PLOW COMPANY LIMITED

CALGARY REGINA **WINNIPEG** EDMONTON SASKATOON

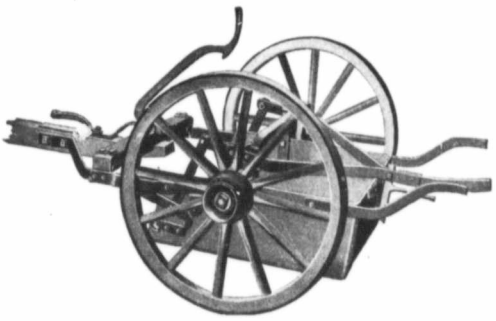
Road Building Machinery

We carry in stock a full line of Road Machines, Elevating Graders, Municipal and Railroad Scrapers, Plows and Wagons.

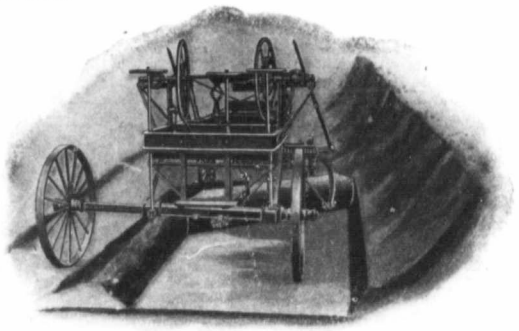


Deere Monitor Grading Plow.

SPECIAL PRICE LIST AND LITERATURE ON APPLICATION



Western Wheel Scraper

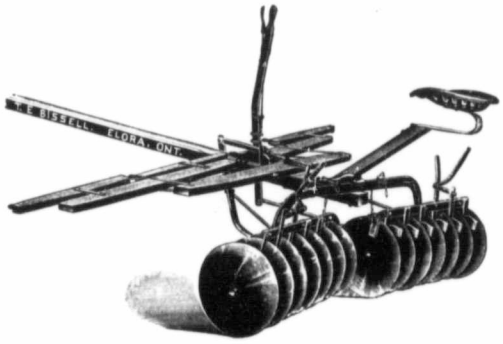


The American Western Reversible Road Machine.

JOHN DEERE PLOW COMPANY LIMITED

CALGARY REGINA WINNIPEG EDMONTON SASKATOON

Genuine Bissell Disc Harrow



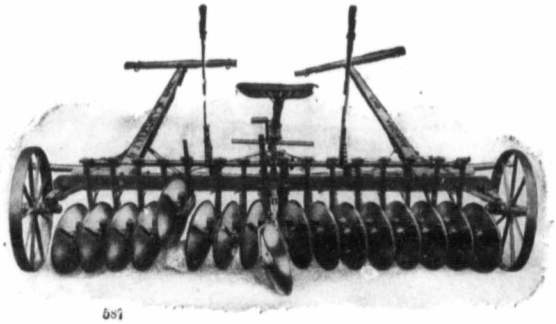
THE Disc that farmers want. **Some good features are**—CORRECT BALANCE—Stays down at its work, does not buckle, bind and hump up in the center.

Shape of Disc—Cuts, turns and stirs the soil, where others only scrape the ground.

Light of Draft—Forty hard Anti-friction Balls used in every "Bissell" Harrow relieve the horses.

Ease on Horses' Necks—The HITCH is well back, the seat projects at the rear of frame; no weight on necks

Cyclone Wheel Disc Harrow



EASY to move from one field to the other. No danger of dulling discs on hard road. Can be backed or turned anywhere. Each disc is independent and equipped with a pressure spring, the same as a grain drill.

More or less pressure can be applied at the will of the operator. For discing stubble fields, summer fallowing, or plowed land it has no equal.

Can also be used as a weeder or cultivator, being so constructed that the discs can be set at any depth desired; the space between discs being thoroughly worked and much lighter draft than a cultivator.

Write for Catalogue.

JOHN DEERE PLOW COMPANY LIMITED

CALGARY REGINA WINNIPEG EDMONTON SASKATOON

NEW DEAL WAGON

New-Deal Wagon

Is made of air-seasoned lumber.

Is equipped with double collar skein.

Skeins are dust-proof, therefore will hold grease longer and run easier than others.

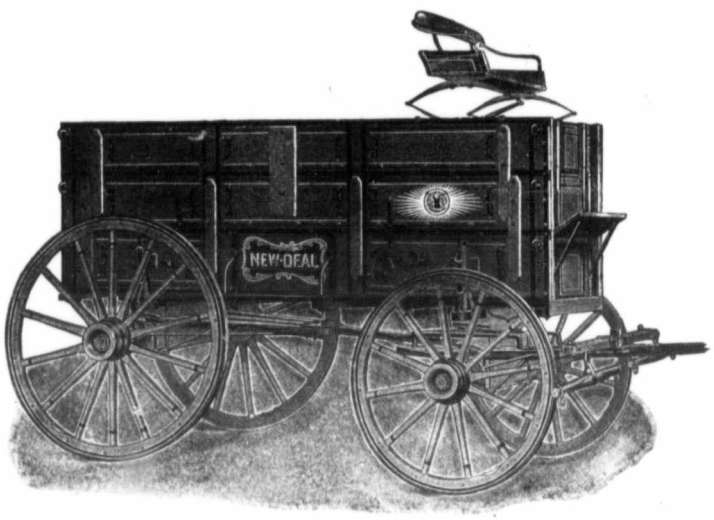
Skeins are heavier; bell is longer and larger, taking more axle.

Has riveted grain cleats (not nailed or screwed).

Bottom of box is reinforced both front and rear.

Has clipped gear, both front and rear.

Box is made flax tight



New-Deal Wagon

Spring seat with 3-leaf springs (not single leaf).

Steel bolster stake plates on side of box.

Neckyoke 48 in. long (not 42 in.)

Has trussed tongue, cannot break or warp.

Has channel iron reach really indestructible.

Is extra well painted, striped and finished

Possesses a great many distinctive features of merit.

JOHN DEERE PLOW CO. LTD.

WINNIPEG REGINA CALGARY EDMONTON SASKATOON

THE FLEURY PULVERIZER

Pulverizes and Packs the Soil

How a Pulverizer Helps

A good seed bed is composed of a fine mellow soil well packed to insure capillary connection with the subsoil.

Such a seed bed will produce better crops than a lumpy one of the same chemical composition.

This is why a good pulverizer should be a part of your equipment. Other things being equal it insures better crops.

It is often necessary to plow land when it will break up into large chunks or clods. In such a case, a pulverizer is indispensable for fining the soil.

The fact is, almost any soil is benefited by being pulverized and packed after plowing, regardless of its condition.

Light, loose soils are kept from drifting by being treated in this way.

The Fleury does the Business

In the first place it is sufficiently heavy for its work, there is no necessity for weighting.

The sections are so constructed that they pulverize all lumps and pack the soil so it is in good seed bed condition. At the same time, it helps to produce a surface mulch which holds moisture.

It does the work of both a pulverizer and a land roller.

Also, this pulverizer is sufficiently flexible to accommodate itself to rolling land.

Besides this, it is very durable. It has bushings that take the wear instead of the wheels.

The ends of the wheel hubs are chilled which reduces the end wear on the wheels.

These are a few of the excellent features of the Fleury Pulverizers. Ask us for further information.

Fleury Pulverizers are made in the following sizes:

16-section, 1-pole
22-section, 1-pole
22-section, 2-pole
24-section, 2-pole
22-section, 2-pole, pulley hitch, with doubletrees
24-section, 2-pole, pulley hitch, with doubletrees

JOHN DEERE PLOW CO. LTD.

WINNIPEG REGINA CALGARY EDMONTON SASKATOON

The First in the Field, 1910

This represents one of the brand new S-M, 30 h.p. Engines with 24-inch wheels and 12-inch wheel extensions, operating a Cockshutt 14-inch, 10-bottom gang. This outfit is at work on an old field, which had not been plowed for a period of 25 years. Observe the nice, clean and well turned furrow and at the same time the deep and effective manner in which the plow has been set to operate. The S-M combination Plowing and Threshing Engines are no longer in the experimental stage. Their plowing strength and effectiveness is as much an assured fact as is their ability to do threshing as it should be done. Write our Winnipeg Office regarding any of the following powers, which we are placing on the market this year:

22-25-27-30-32 Horse Powers

together with full particulars as to equipment for Plowing or Threshing purposes or the two combined. The customer that possesses a S-M Combination Engine this season will have the very best Engine that can be produced for money. Nothing is lacking. They possess proper balance, are built and finished of superior material and in a superior manner and have an abundance of reserve over their rated power.

N. B. At the same time, do not forget that we are the manufacturers of the celebrated "Great West" Separator

YOURS FOR VALUE

Sawyer-Massey Co. Limited.

HAMILTON, Ont. WINNIPEG, Man.

A MAGAZINE FOR THE FARM AND HOME

THE CANADIAN THRESHERMAN AND FARMER

Vol. XV. WINNIPEG, CANADA, MAY, 1910. No. 5.

"The Cost of High Living"

By Pearl Richmond Hamilton

AT present we hear much regarding the high cost of living. The farmer, the tradesman, the laborer, the merchant, the manufacturer, the professional man, the politician, etc., etc., all seem to gravitate around this topic until we find ourselves in the position where governments are turning it over to commissions composed of learned men to investigate for the purpose of ascertaining the true status of this germ of discontent that has crept into our civilization and to try and discover some toxic principle that will tend to counteract its ravages.

Every little while progress is appalled with the fact that her skirts have been soiled by some desecration perpetuated by that horde which we call "men and women." We think we are travelling over a smooth road that has no stones, bogs or mires when of a sudden we find ourselves jolted and jarred into a state where we see things as they are and we find what we fully intended for an unsullied page to be blotted and smeared with mistakes.

But what is this "High Cost of Living" that we hear so much about? Is it merely a scare or a political issue, or is it a real fact? Reduced to a basis of dollars and cents, it means simply that the average man of to-day is paying for the mere maintenance of life out of proportion to what he is able to earn. It means that the price of food, clothing and shelter has gone up at a higher rate than wages. It means, looked at from the eyes of the socialist, that the poor are getting poorer and that the rich are getting richer. It means that an unnatural state of affairs has crept into our industrial life that is putting things awry and that civilization is making a desperate struggle to adjust itself to the new conditions.

Forty years ago, yea twenty-five years ago, the term "High Cost of Living" was unknown and I doubt if the term can be found in anything but the most recent text books on political economy. The average man of twenty-five years ago tried to be and was to a very great extent sufficient unto himself and looked at from the standpoint of the farmer, he was almost absolutely so. He provided his food, clothing and shelter largely from the materials at hand and looked very little to the outside world to help him out. It mattered little or nothing to him whether a strike occurred in one of our great industrial plants and whether it lasted for a day, a month or a year, but it is different to-day. When a strike occurs that takes in any one of our large industrial enterprises, (and when it takes in one it takes in practically all of them, so unionized is our system of labor) the farmer feels it.

We will say that a strike occurs in a steel mill. The next time the farmer goes to town to buy a spool of barb wire, he is informed that the price has gone up 10 per cent. and upon asking the reason he is told that a strike has occurred in the steel mills which has advanced the price of wire. He goes to town to buy a suit of clothes and upon finding that he has to pay $1.00 more for the same suit than what he paid when he bought his last one, he of of course asks the reason why, and is informed that the weavers have been on a strike and that the cost of production has increased accordingly.

The laborer in the town feels it more than does the farmer. Someone gets it into his head that he wants to play the "bull and bear" game a little bit strong and the first thing we know there is a beautiful corner in the price of wheat. The first thing the laborer knows he is paying 6c. a

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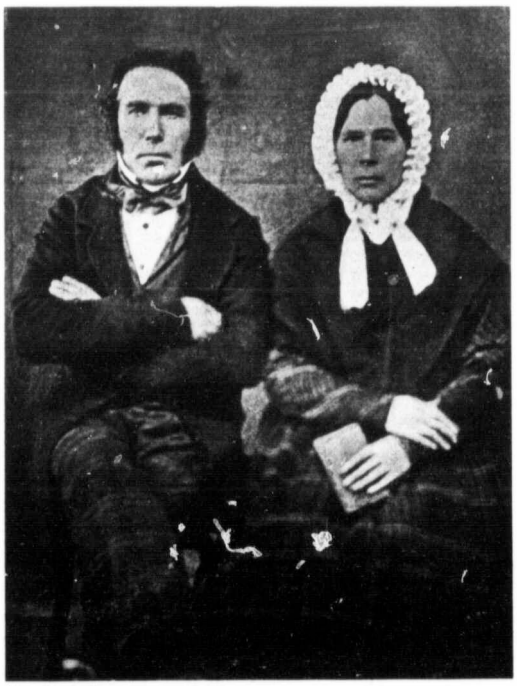


The above illustration is published for the reason that we consider it apt in a discussion of the "High Cost of Living." It represents an Ontario couple who in the early days came to the wilds of that eastern province and wrested a farm from the wilderness. The "High Cost of Living" was a thing unknown to this couple. They were sufficient unto themselves.

A glance at the illustration will show that the dress of the woman and the trousers of the man are made from the same web. Sheep were raised on the farm, the wool was carded and spun and woven by the house-wife's own hands and she in turn made up the articles of clothing.

Mr. and Mrs. J. A. Anderson of whom the above is an illustration were a sturdy old Scotch couple. They lived in their own way and their immediate surroundings were sufficient unto themselves. Sterling in character, true to principle, they with their kind paved the way for a heritage in Canada that the present generation could never have otherwise enjoyed.

Mr. and Mrs. Anderson built up a valuable farm out of practically nothing, raised a family of ten children and when the call of his country demanded, Mr. Anderson rendered valuable service in the Mackenzie Rebellion of 1837.

The simplicity and whole-heartedness of the life of these early pioneers should serve as a valuable object lesson to the average man of to-day, who is continually on the war-path against the "High Cost of Living."

Halley's Comet, and What It Could Mean

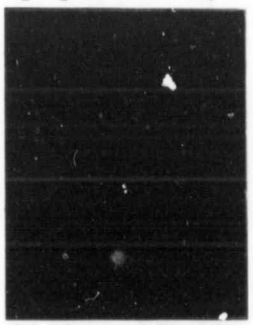
ON May 18th, so astronomers tell us, the earth will pass through the tail of the much talked of Halley's Comet. Astronomical science has arrived at such a degree of perfection that the astronomer to-day through intricate calculation is enabled to ascertain the position of this particular member of this planetarial world to a nicety.

As to just what a comet is scientists are not agreed, but in so far as Halley's Comet is concerned they have come to the conclusion, backed up by its past history, that it appears every seventy-five years, as will be seen from the following table:

Year.	Interval in years.	Year	Interval in years.
B.C. 11.8	....	A.D. 989.7	77.5
A.D. 66.0	77.8	1066.2	76.5
141.1	75.1	1145.3	79.1
218.2	77.1	1222.9	77.6
295.2	77.0	1301.8	78.9
373.8	78.6	1378.8	77.0
451.5	77.7	1456.4	77.6
530.8	79.3	1531.6	75.2
607.3	76.5	1607.8	76.2
684.8	77.5	1682.7	74.9
760.4	75.6	1759.2	76.5
837.2	76.8	1835.8	76.7
912.2	75.0	1910.3	74.5

In the April number of the Review of Reviews there appears a very interesting description of this comet and for want of better information we give it here.

Those who remember the great comet of 1882 will recall that many said that it was the cause of the war that England was then carrying on in Egypt; and our own great Civil War was ushered in by Donati's splendid comet of 1858, and by the comets of 1860 and 1861. Such coincidences can be numbered many fold; and it is but natural that there should have grown up in the popular mind down through the centuries the conviction that a comet brought in its train disasters of all kinds—war, murder and sudden death. Undoubtedly this old superstition has been the cause of our present interest in comets, and the year 1910, with its return of Halley's comet, is by some looked upon with fear and dread, for does not this comet of Halley's come so close to the earth that we are to sweep right through its tail? What will happen if the astronomers have made a slight mistake in their calculations and the comet should come into collision with the earth? With the earth traveling in space at the great speed of 18½ miles per second, and the comet in the opposite direction with a velocity even greater, such a head-on collision would be appalling; the earth might possibly be blown to pieces. Altogether we have records of about 1,000 comets, half of which were discovered before the invention of the telescope three hundred years ago. At the present time five or six comets are discovered yearly; but most of these are faint and can be seen only with the aid of a telescope and are consequently known only to the astronomer. If each comet brought a war along with it, it would, indeed, require the continued sitting of The Hague Conference! The absudity of this notion was recognized 150 years ago. One author of that period says: "If war is caused by the bile of a sovereign becoming heated by the approach of a comet, a court doctor should be employed, who should counteract the action of the comet by the application of sundry doses of rhubarb." There have, indeed, been remarkable comets seen in years when a great war was being waged, or a comet may have



Halley's Comet as seen in February 1910.

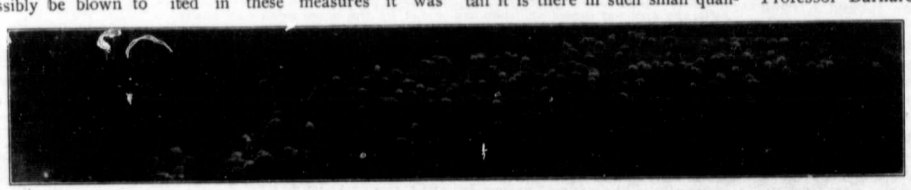
appeared a year or two previous. There have also been splendid comets in the sky when there was no attendant war, and likewise there have been great wars without their attendant comet. We do not recall any serious outbreak of hostilities following the train of Coggia's fine comet of the year 1874, and certainly no one can point to a remarkable comet of the time of the recent Russian-Japanese war; and that surely was a great war. It would, indeed, be remarkable if wars and comets did not at times appear together, but to imagine that a heavenly body of such weight as a comet could be able to disturb the affairs of men is perfectly absurd. This has even less foundation than the superstition that the moon has an influence on weather, for all the statistics of modern science show that the weather is absolutely independent of the moon.

At the last appearance of the comet in 1835-36, its position in the sky was measured by many astronomers. From its motions as exhibited in these measures it was possible to calculate the comet's journey off to hundreds of million of miles from the sun. As the comet travelled through space it went close to some of the bodies of the solar system. These planets pull the comet exactly in the same way as does the sun, but with less force, since they weigh much less than the sun. The planets might accelerate or retard the motion of the comet depending on their relative positions. These "perturbations" of the comet's motion is necessary for the astronomer to calculate, and if the comet happened to pass close to a great planet the perturbations might be very great. By referring to the table, it will be seen that the time occupied by the comet in returning changes considerably, the difference between the least and greatest is as much as five years. At the 1835 appearance the calculations were very simple but for the 1910 appearance was exceedingly difficult, due to the close approach of Jupiter. In spite of these difficulties two Englishmen, Cowell and Crommelin, calculated the time of perihelion passage within three days of the actual time and this, too, when the comet took nearly seventy-five years to make its return. By pointing the telescopic camera to the position in the sky calculated by them, Wolf discovered the comet seven months before it would be closest to the sun, when still at a distance of three hundred millions of miles from the earth. In these seven months the comet has been gradually brightening, but very slowly; but before many days from this writing it will be a wonderful spectacle in the skies.

What will happen when we pass through the tail on May 18? Will the cyanogen be enough to poison us? Or if we escape will vegetation be blighted or disease brought? We shall be directly in line at 9 p.m., Eastern standard time. The Japanese people will be directed towards the sun and comet and will form the central part of the bombardment of the particles of cyanogen gas. However, the modern theory of the tail of comets tells us that though their size is enormous their weight is excessively small, and as a result the number of particles per cubic mile in the comets tail is almost vanishable small. The comet of 1882 was so situated that we could see through ten million miles of its tail, yet stars shone through it with undimmed lustre. Hence, though there may be cyanogen gas in the tail it is there in such small quantities that could we have a cubic mile of the tail concentrated into a glass breaker in the laboratory, it would probably take the greatest refinement of chemical research to detect the cyanogen. In addition the earth is covered over with a shell of atmosphere thousands of times denser than the comet's tail, and the particles could not possibly penetrate to the earth's surface.

The tail of the comet always points away from the sun and is more or less curved, depending on the relative speed of the particles that are shot off to form the tail, and of the comet in its orbit. A splendid theory explaining the apparent negation of gravitation in comet's tails pointing away from the sun has lately been developed by the Swedish scientist Arrhenius. According to him the particles of the tail are exceedingly small, and they are driven from the sun by the pressure of sunlight. In addition a new tail is continually being formed, the old material is left behind in space and the comet is slowly wasting away. The rarity of the tail may be imagined when we realize that Halley's comet has lasted as we know for two thousand years and still it is not consumed.

Although the comet will pass directly across the face of the sun on May 18, it is questionable if even an astronomer will be able to see the transit, and although we shall be enveloped in the tail for some hours and shall be bombarded by cometary material, we probably shall be totally unaware of it, for the cometary particles are so small that probably not even a meteor shower will take place. Indeed, so little of an unusual nature will occur that nothing would be known of it were it not for the calculations of the astronomer. The earth has more than once passed through the tail of a comet; it happened last in 1861, but no one was sure that anything unusual was observed. However, May 18 will be a memorable day to the astronomer and all the refinements of modern science will be employed. Meanwhile the comet, as it gets closer and closer to the sun, is getting brighter and the tail is increasing in length. On February 3 Professor Barnard estimated the length of tail at 5,000,000 miles, while on February 27 this had increased to 14,000,000 and this almost two months before the comet is closest to the sun and most active. The modern camera with the sensitive plate, in the skillful hands of a great man like Professor Barnard will bring to us photographs of matchless beauty showing the many and varied changes taking place in the tail, while the



spectroscope will help to solve many perplexing questions of interest to the astronomer. From the length of the tail before passing through the sun it seems almost certain that Halley's comet will be such a magnificent spectacle that a quarter century hence we will tell our grandchildren about the great comet of 1910.

In the Saturday Evening Post of April 16th, there appears an article on "The Peril of the Comet" and while this may be somewhat overdrawn, nevertheless, it is interesting, viewed from the standpoint of possibilities. It says:

"Clearly a comet's tail must be some rare and delicate fabric. By means of a wonderful instrument called the spectroscope, an instrument which analyzes a distant star as readily as if it were a stone picked up in the road, it has been discovered that the comet's tail is composed of gases called hydrocarbons—combinations of hydrogen and carbon—and that it bears a decided chemical resemblance to the blue flame of a kitchen gas-stove. Street-gas is poisonous. If a comet's tail were dense enough it is, therefore, conceivable that every human being on this planet might be asphyxiated by breathing the toxic vapor as the earth plowed through it. There is also the possibility suggested by Flammarion, that the gases of a very dense tail—denser than any ever known—might so combine with the nitrogen, which constitutes nearly 80 per cent. of the air re breath, that the atmosphere would be converted into the "laughing gas" employed by dentists. The world would die in a delirium of joy. At first a delightful serenity would settle upon mankind. Then there would follow a contagious gayety, febrile exaltation, a paroxysm of delight and finally madness. Flammarion even conceived the world merrily dancing a joyous, hysterical sarabband in which it perishes laughing.

The tail of a comet is fraught with still other remotely possible dangers. Our atmosphere contains a certain amount of hydrogen, a marvelously light gas to which airships owe their buoyancy. Besides its lightness, the gas is characterized by an extreme inflammability. The law of the diffusion of gases teaches us that part of this hydrogen in the air is mechanically mixed with other gases and that part of it probably floats in the upper air, far beyond the reach of any balloon. A comet may be regarded as a huge lighted celestial match which may be brought dangerously near that upper layer of highly inflammable hydrogen. If the gas should ever be touched off by this cometary match flame a planet would be ignited. The whole atmosphere would become a seething ocean of flame, in which forests and cities would burn like straw, in which oceans would boil away in vast clouds of steam, and in which all animal life would be snuffed out of existence before it ever realized that the world was on fire. In a word, the globe would become a planetary funeral pyre. Since water results from burning hydrogen in oxygen, this same fierce and terrible flame would be speedily extinguished by a mighty deluge which would engulf the earth.

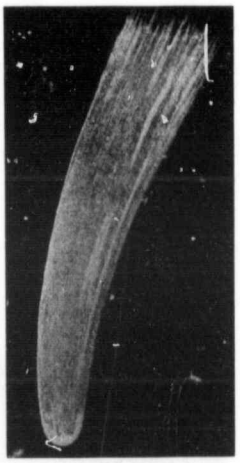
The spectroscope analysis of Halley's comet has revealed the presence of cyanogen gas in the tail. Cyanogen is a compound of nitrogen and carbon, one of the most poisonous combinations with which the chemist is familiar. Prussic acid, potassium cyanid and many other cyanids, all of them almost instantaneously fatal if taken into the human system, are compounds of cyanogen. If that gas were present in large enough quantities one flick of a comet's tail would end all human and animal existence.

Fortunately, these possible effects of breathing a lungful of comet's-tail, all of them studied by the imaginative Flammarion, are so far-stretched that no scientist of repute considers them at all seriously.

On the other hand, a collision of the earth with a comet would undoubtedly prove disastrous, how disastrous would depend largely on the size of the comet's head and on its speed. That a violent heat would be developed we have every reason to believe from our knowledge of meteors. The mere movement of a meteor through the thin upper layers of our atmosphere produces a dazzling trail and reduces the meteor itself to a molten, metallic mass. Arrest a body in swift motion and you must dissipate its energy in some way. As a rule the energy is converted into heat. A bullet discharged from a rifle is often melted when suddenly stopped by steel armour. A comet travels at a pace compared with which a projectile fired from the most powerful 12-inch gun seems only to crawl. What, then, must be the frightful effect if it should even strike the earth. A comet rushes through space, not at the bullet's rate of hundreds of miles an hour but of a million miles an hour. The bigger it is and the faster it moves the greater will be the heat developed by its stoppage. "At the first contact with the upper regions of the atmosphere," says Professor Simon Newcomb, "the whole heavens would be illuminated with a resplendence beyond that of a thousand suns, the sky radiating a light which would blind every eye that beheld it, and a heat which would melt the hardest rocks." The same conclusion was reached by Mr. Faye.

If there is ever danger of a collision with a comet of formidable size, the human race will be in the horrible predicament of knowing the exact hour and minute of its doom. The newspapers will print a despatch from some great observatory.

At first the discovery produces not even a ripple of excitement. Telescopic comets are discovered too frequently. Three days later the discoverer has worked out an ephemeris which gives the date



Halley's Comet as seen in 1682

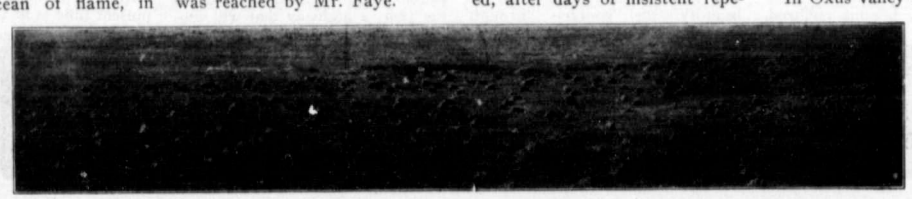
when the body will pass around the sun and which indicates the comet's path. He finds that on a certain day and at a certain hour the earth and the comet must crash together. Again and again he repeats his calculations, hoping that he may have erred. The utmost permissable allowance for accelerations and retardations caused by the outer planets and the solar system fails to change the result. The earth and the comet must meet. With some hesitation he sends a telegram to a central observatory which acts as a distributor of astronomical news. At first his prediction is discredited and even laughed at. Another computation is made at the observatory. Again mathematics infallibly indicates the exact time and plane of the encounter, and the last lingering hope is dispelled. Telegrams are sent to astronomical societies, to the leading scientific periodicals and to the more conservative newspapers.

At first the prediction of the earth's doom is received with popular incredulity, engendered by years of newspaper misrepresentation. The world's end has been too frequently and too frightfully foretold on flamboyant double-page Sunday editions. When the truth is at last accepted, after days of insistent repetition of the original announcement, a wave of terror runs through the world. There is no escape. International committees of astronomers meet daily to mark the motion of the comet. Bulletins are published announcing the steadily dwindling distance between the world and the huge projectile in the sky. The great tail, arching the heavens as the comet approaches, seems like a mighty fiery sword held in an unseen Titanic hand and relentlessly sweeping down.

As the comet draws nearer and nearer night changes into an awful nocturnal day. Even at noon the comet outshines the sun. There is no twilight. The sun sets, but the comet glows in the sky, another more brilliant luminary, marvelously, yet fearfully, arrayed in a fiery plume that overspreads the sky. The moon is completely lost and the stars are drowned out in this dazzling glare. Warned by the astronomers, mankind takes refuge in subterranean retreats to await its fate. Long before the actual collision, long before the earth is reduced to a maelstrom of lava, gas, steam and planetary debris, mankind is annihilated with merciful swiftness by heat and suffocation. A candle flame blown out by a gust of wind is no more quickly extinguished.

When the comet encounters the upper layers of the atmosphere there is a blinding flash, due to the friction between the air and the comet. A few seconds later the crash comes. From the earth molten rock and flame, pent up for geologic ages, burst forth geyser-like. The globe is converted into a gigantic volcano, in the eruption of which oceans are spilled and continents are torn asunder to vanish like wax in a furnace. When it is all over, the earth swims through space, a blackened planetary cinder, desolate and dead.

The manufacture of paper coated with aluminum as a substitute for tin-foil has begun to assume indusrial importance, Within a year the Wickel process has been successfully applied in France to the metallizing, with aluminum, of paper of all thicknesses, from that of cigarette paper up to that of the sheets from which postal cards are made. Aluminum paper has the advantage over tinfoil that it contains no lead. It is suitable for enveloping all kinds of confectionery, for making paper boxes, and even for wall hangings. When used as wallpaper it possesses the admirable quality of being cleanable with a wet cloth or sponge.



In Oxus valley horseshoes made of the antlers of the mountain deer, fastened with horn pins, are employed. Horses in the Soudan wear socks of camel's skin.

Good Roads and the Farmer

By E. F. W.

"I OUGHT to go to town but the roads are so bad I dare not try it," is an expression that we often hear from the farmer during certain seasons of the year, and it is said with such an air of submission that one cannot help but draw the conclusion that in many cases the farmers have accepted the "bad road" as one of the necessary evils—a thing that cannot be avoided and consequently must be endured.

How often have we wanted to go somewhere, yet were prevented by impassable roads. How often have we been obliged to put two teams on a load that was in reality only half a load because of the fact that the wagon cut in to the axles and made the draft almost prohibitive? How often have we ruined a valuable horse through spavin, sweeny or some other blemish because that particular horse was obliged to pull abnormally on what should have been an easy load?

The above are simply mentioned in passing for Western Canada is a new country and a new country is more than likely to leave its road building until the very last, suffering much inconvenience and loss of money in the meantime.

The public roads are in evolution from the primary paths made by animals and men. Of the identity of the first beings who made paths in the wilderness, we are uncertain. Whatever their character and origin, we may be reasonably certain that they had roads of some sort. It cannot be positively asserted that the primitive Indian had roads, but that such was the case seems not unlikely. Several circumstances indicate that they had some system of communication. The remains of their works are often found on streams that are not navigtable and groups of them are concentrated about natural stragetic points, such as mountain passes; thus making natural the inference that such avenues of overland travel existed. The buffalo herds made broad, straight paths from point to point which can yet be traced. The animals instinctively chose the best routes and in many cases it has been found impossible to improve upon them. The Indians used these thoroughfares for many of their trails and later the white man, finding them good, appropriated them to his own use.

The first white settlers to start with had very little transport. Therefore, a path to accommodate the pack horse was sufficient for their needs. As population grew and the country became civilized, more commodities had to be moved and the wagon superceded the pack train. This necessitated widening the former paths and when it was found that the soft earth would not sustain the wagon traffic, attention was given to the road bed.

The first step in this direction was the construction of the corduroy road, made by the use of sticks and logs. This was a step forward, although it is possible that some of you have ridden over such roads and know by experience tha they do not compare very favorably with some of our roads to-day.

The advent of the stage coach and freight wagon brought another era in road building. This caused much friction between the pack horse owners and the stage coach and wagon men—a thing which always has and probably always will happen when a radical change is made in methods of transportation. We see the principle illustrated to-day in much the same in the advent of automobiles. The adoption of the stage coach ushered in the adoption of the macadamized road, or as it was known at that time a road made of layers of broken stone. It is true, however, that but few such roads were built at the time. Most of the old roads were merely widened and graded, but remained of dirt.

A good road rightly kept is the railway of the world. Like well-paved streets, they make living along them most desirable. They economize time and transportation of products, reduce wear and tear on horses, harness and vehicles and enhance the value of real estate. They raise the value of farm lands and farm products, and tend to beautify the country through which they pass. They facilitate the country's growth in education, religion and sociability, for as one writer once said, "The road and the schoolmaster are the two most important agencies in advancing civilization."

The good road has decided economic value in any country. It holds the balance of power for good. They have a money value to farmers as well as political and social value and leaving out inconvenience, comfort, social value and refined influences, which good roads always enhance and looking at them only from the "almighty dollar" side, they are found to pay handsome dividends each year.

The question of road construction in a new country like Western Canada is one that is not very likely to receive its due attention. The new settler is far too much occupied with other matters to pay his respects to the public highways. There is little regard for road sites, old trails being followed wherever available and little or no attempt is made to establish a permanent road. As the country grows older and the crop becomes more and more a factor in its growth, the marketing of this same crop becomes a problem on the hands of the farmer, and he begins to realize that the good road is something more than a thing of beauty.

The Kind of Road That Makes Farming a Pleasure.

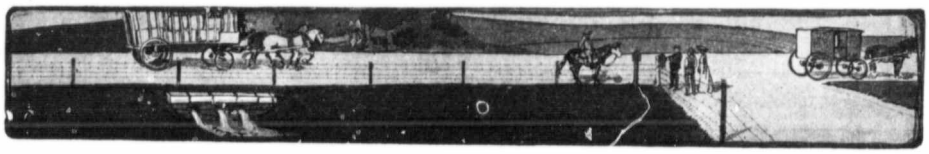
This is the condition of a large part of Western Canada to-day. The trail across the prairie has been left behind, the section lines are being fenced and civilization and settlement are demanding a passable highway twelve months in the year, a highway that will support a load and at the same time will not over-tax the farmer's team. The average farmer says there is no hurry about this matter; that good roads will come in due time, but what about the enormous amount of annoyance and expense caused during the waiting period.

When Appius Claudius, the famous Roman road builder, started out to build the now famous Appiun way, he did not wait for laggard builders, automobile clubs and farmers to pass resolutions on the subject, but simply put men to work and constructed a road 330 miles in length by 16 feet wide, from Rome south to Capua to Brindisi and although over 2,200 years have passed since then, the Appiun way is still the best country road in all of Europe. If figures are to be arrived at as regards the amount of money that road has earned Rome, it would doubtless be found that it has paid for itself hundreds of times, not only in cheapness of transportation provided to those who live along it, but through the increase in the value of real estate.

Although the question of road improving is of direct interest to the residents of our towns and cities, it is most always one of importance to the farmers. By far the greater mileage of our roads are located in the farming districts and the chief use of these roads is by the farmers in getting their products to market and for social intercourse with their neighbors. In recent years the automobile has served a good end in that it brings our highways into use by tourists travelling for pleasure and thus demanding a good road. This use will doubtless be greatly increased in the future, but the bulk of the travel on country roads for a considerable time to come will continue to be that of the farm wagon or buggy. So while every farmer should join hands with the automobile owners in promoting the good road cause, it is likely to remain a farmers' question for sometime and if it is to be settled rightly, it must be settled in accordance with the wishes of the farmers.

Perhaps this statement should be qualified to some extent by saying "enlightened farmers" for there is no use in denying that for a long time the attitude of the farmers towards the good road proposition was not as favorable as it should have been, and there are still a great many who fail to realize the great importance of promoting their prosperity, comfort and social welfare. Western Canada at the present time is in a most unfortunate condition as regards good roads; it is a prairie country; consequently the average road is not confined to any partic-

ular place. If the old trail becomes too much cut up and worn it is an easy matter to go a few feet on either side and establish a new one on the prairie. The result is that the years are passing by and few permanent roads are being established, excepting in the older settled portions.



In a recent address before the American Bankers' Association at Chicago, Mr. James J. Hill attracted the attention of the entire country by his warning that unless the agricultural population and its

This kind of road makes farming expensive

product increased in the United States, that they would soon find themselves facing the grave question of a deficient food supply. He pointed out the undeniable fact that the farmer is the main reliance; every other activity depends upon that. If the farm is neglected, if the food is not produced, somebody and everybody must go hungry.

There is no other one thing that will tend to conserve the life on the farm and to promote our agricultural industry as much as good roads. There is no other one thing that makes life so enjoyable and helps to build up the wealth and prosperity of a country. Western Canada did not begin to develop until the various railway lines began to cross and criss-cross the country. The soil lay for years just as productive as it is to-day, but nobody came to till it. What is true of the country in so far as railways are concerned, is true of every community in so far as good roads are concerned, for the country highway binds town and country together, tending ever to promote business enterprise and an easy avenue of meeting between buyer and seller.

The one great obstacle to the building of good roads in Western Canada is the fact that so much of the land is as yet unoccupied. It is quit enough to ask every farmer to build a road the length of his own farm, but if this were to be done in Western Canada there would be hundreds of miles of road that would not be built; but there is one thing we can do and that is to follow the example of Appius Cladius in at least a reasonable measure and build our roads for the future. Imagine yourself riding over the prairie, rough and stony and full of buffalo wallows and when you came within a mile of the farmer's house you hit upon a nice piece of road that had been carefully graded and well kept. Would it not improve your estimation of that particular farmer? Would it not make a pleasant finish to your journey? and if we were to start out with this end in view, as the country becomes settled up, it will not be long before the links in this good road chain become connected and we will have a system of good roads that will be a credit to the country.

The keeping up of a road once it is graded is a very easy matter. The soil of Western Canada is particularly adapted to furnishing a hard, smooth surface. There are certain seasons of the year, however, when the gumbo becomes very sticky and the wheels cut the road up into deep ruts. As soon as it begins to get a little dry, if the farmer were to take his disc harrow and run over the road and then, say once a week, if he were to use a split log drag, which is a very inexpensive and at the same time efficient tool, it would only be a matter of a year or so until he could get a piece of road into such shape that when the water falls upon it that it would not lie there, but would run off, leaving the surface of the road smooth and hard. once built it will keep it so and not only that, but it will improve its condition the longer it is used.

The question of good roads, as has often been stated before, is simply a matter of dollars and cents to the farmer. He is too apt to look upon it as something that the municipality should provide for, while at the same time he is the one that uses the road. Going to the country post office or store, we can hear the farmers discussing politics, the price of wheat, Halley's comet and a hundred and one other things, but it is a rare thing to listen to a discussion on good roads. Road building is a thing that the farmer seems to regard as beneath him and not of sufficient importance to warrant his attention, while every time he hauls a load of wheat to town he is perhaps losing a nice bit of profit through imperfect roads. His horses do not last as long, his harness wears out prematurely and his wagons last only about half as long as they should, to say nothing about the extra amount of time it takes to go to and from his principal market place.

I have scarcely ever seen the matter of good roads made a political issue, and I have often wondered why some political party did not take it up and promise great things in road construction as a political handle with which to secure votes. It would be a most laudable thing on the part of any political party leader during his term of office to equip his particular province with hundreds of miles of well graded, well paved, passable roads.

A veritable "Lovers' Lane

DeWard King, the inventor of the split log drag, has done more towards the building of a system of good roads than any other man who lived before his time or who is living at the present time. He evolved something that any farmer can make and once made will last practically a life time. It will not build a road, but when

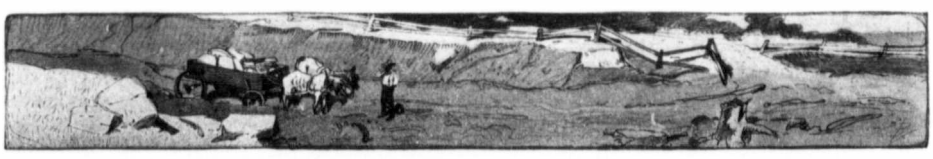
Only a short time ago the writer had occasion to go about seven miles outside the City of Winnipeg and while the road upon which we travelled was supposed to be a public thoroughfare, it was almost impossible for a single horse to pull two of us in an open buggy. I wondered at that time what the farmer would do who wished to come to town with a load over this same road. If it were a case of necessity, it would mean that he would have to use either two teams or else take half a load.

The automobile, in sections

The kind of road that makes farming profitable

where it is used sufficiently, will probably do more to build up a system of good roads than any other one thing. The automobile does not necessarily have to have a good road to travel over, but it must have a good road if those who ride in the car are to derive any pleasure from the ride itself. The man who owns an automobile in the community is generally a live, up-to-date, wide awake individual and he will use his utmost influence to see that a system of good roads is perfected in his particular community. The various automobile associations wherever they are formed, will also take up the subject of good roads, all of which will tend to stir up a certain amount of latent energy in the minds of the farmers.

It is up to the merchants in every town to boost the cause of good roads. The merchants of Western Canada lose hundreds of dollars every year through a system of roads so poor that the farmers cannot get to town as often as they would like. Many a time a farmer has an idea that he would like to go to town to purchase something, but the bad road confronts him and he accordingly stays at home. This may not seem much when viewed from the standpoint of a single farmer, but when we take the farmers as a whole and the roads as a whole, it amounts to considerable within a year. Boost the cause of good roads wherever you go; never grumble at your road tax, but pay it out to the limit, for this particular item. It is bread cast upon the waters and will return a hundred fold.



Li'le Eph. says — Gee! Ah's sho' glad Ah ain't nebber been in politics.

Good Water For The Farm

By VINCENT J. YAWMANS

IT may be well before we begin the discussion of the farm water supply to note the fact that water anywhere is deceptive stuff. Whether in the farm well or city reservoir, appearance is no guide to potability—that is, drinkability. In fact, "for ways that are dark" water compares not unfavorably with Mr. Bret Harte's famous Heathen. The records of sanitary criminology abound in murderous waters whose personal appearance was everything that could be desired by the most fastidious. Pellucid, clear, sparkling, of delightful taste, quite odorless, these engaging fluids, upon analysis, have proved to be virulent poisons swarming with disease germs.

The sparkle of well and spring water is largely due to its content of carbon dioxid, the gas with which ordinary soda-water is charged. In the case of a natural water this gas is usually derived from the decay of organic matter. Soils soaked with sewage may, therefore, furnish a water clear, sparkling and, nevertheless, highly dangerous. The action of the ordinary household faucet filter well illustrates the deceitfulness of appearances. It produces a clear, sediment-free supply, but is not only quite useless in rendering contaminated water safe to drink, but may actually serve as an artificial hatchery for germs, and further infect the water instead of purifying it.

Even the so-called Pasteur-Chamberland filter, which when clean does remove the bacteria, cannot be depended upon unless it is scrubbed out every day or two, and thoroughly boiled at least once a week. As Professor Conn, a high authority in the bacteriological field, has clearly demonstrated, in default of such constant care (and, as a matter of fact, it rarely or never is so cared for in a family, whatever is done in the laboratory) the water is safer without the use of any filter whatever. In fact, no form of artificial water-filter has been devised that does not require frequent cleaning. The only certain method of rendering polluted water safe to drink is boiling. Even sewage thoroughly boiled would be a safe, if nauseous, beverage—safe, at least, to the extent that it could not transmit infectious disease.

And this is the treatment to be subjected, against which any suspicion of pollution exists. That witty individual, who upon being advised to boil the drink-water, replied that he would rather drink an aquarium than a cemetery, was a better humorist than he was a bacteriologist. The germ aquarium is a poisonous and lethal thing, the germ cemetery relatively safe and harmless.

Water from the spring, the shallow well, the faucet filter and, under certain conditions of surface contamination, from the deep well, also, which looks, tastes and smells good, may be highly poisonous. "Water drawn from deep wells," says Doctor Bayles, "cool, clear and sparkling," has poisoned many people, and, on the other hand, highly colored, dirty-looking water, such, for instance, as that from the juniper swamps of Virginia, may be quite safe.

The foregoing may seem to the reader an undue amount of fuss over an obvious and unimportant point. Such is far from being the case. The wide-spread existence of this trade in appearances even in high places and among intelligent people, was well illustrated a year or two ago, when, during a trip to Panama, Mr. Roosevelt confounded the critics of the Colon water-supply by announcing that he had never tasted a better or more palatable water—the implication being that this was a certificate of wholesomeness. Hence sanitarians feel very strongly on the subject, because the notion that water may be judged by its appearance has killed and is still killing so many persons every year. Here is a sample of what they say, from the volume of Ellen H. Richards and A. G. Woodman, on "Air, Water and Food," which should be of special interest to the farmer:

"Pioneer settlers dug the well as near the kitchen door or the barn-yard as they could find water, with a blind faith in the protecting power of Mother Earth . . . . So persistent is this confidence in Nature that in the light of this day a majority of intelligent people even will quaff at the wayside well or drink freely at a country hotel or go to live in a city without taking thought of the quality of the water . . . . Water is water, and he who pauses with his glass half-way and asks whence comes the supply is scouted as a weak-minded crank."

A few of the possible pollutions of the farm well are illustrated by the accompanying sketches. Nowhere probably is there a well so situated as to be subjected to all these sources of filth, but there are many—thousands of them—subject to infection from one or several. Suppose the man taking a bracing wash in the delightfully cool well-water has some infectious disease of eyes or skin or lungs. It is plain enough that he will, literally have washed his sores in the pitcher of water on the supper table. The washings, of course, are much diluted, and perhaps ninety-nine of the hundred times no harm is done. But, even so, the hundredth or thousandth chance is worth guarding against, even if the family isn't squeamish about drinking from a common wash-basin. Suppose there is infectious or simply dirty material from any source lying about the well or upon the open platform covering it. The chances are at least even that it will be washed in by the diluted steam of kitchen slops, which flows wellward during every rainstorm, or else be scratched in by the hens.

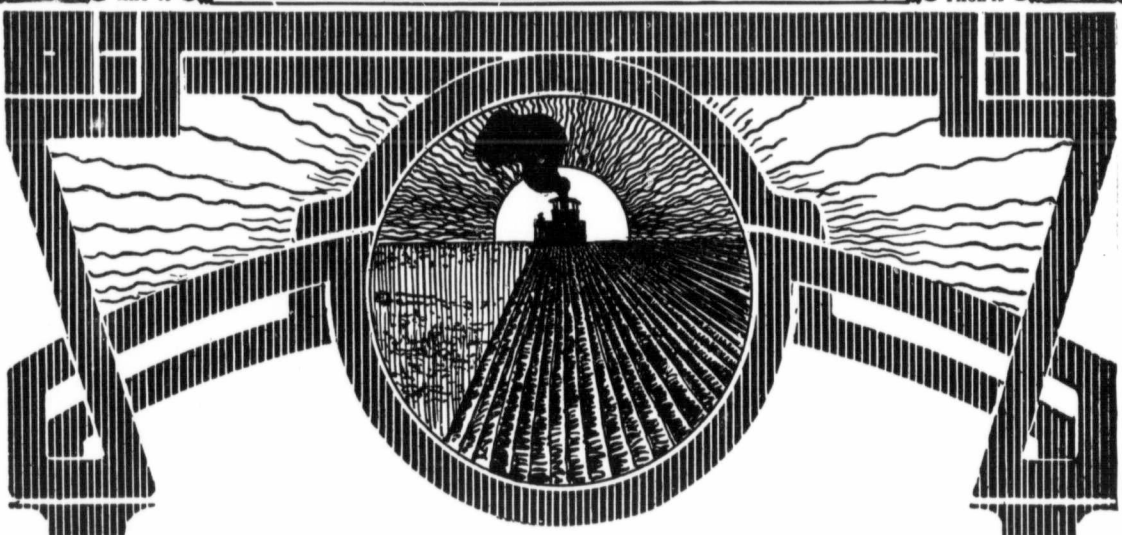
The well when on low ground and in the neighborhood of manure piles, hog-pens, out-door toilets, puddles of kitchen slops, etc., acts as a center for collecting the drainage from these sources, and it makes no discrimination against filthy liquids. The soil, to be sure, at first acts as a filter, especially if it is loam or sand; but in course of time it becomes saturated with filth and then a continuous flow of the latter into the well is maintained. When there are cracks or fault in the ground, connecting cesspool or barn-yard with the well, the flow will be much quicker, and filter action altogether eliminated. Especially in limestone regions there is always a possibility of underground fissures and streams, some of great length.

W. H. S. Bailey records the following remakable case of underground infection: All the people of Lausen, Switzerland, except those occupying a certain row of six houses, obtained their water from a "splendid spring." In a little farm house on the opposite side of the mountain typhoid fever occurred. The brook running past this farm house was used as a local sewer. Very soon an outbreak of the same fever was noted in Lausen. The six families who did not use the spring escaped infection. This put the latter under suspicion. Tests were made for an underground connection between the farm house brook and the spring (by dissolving large quantities of salt and flour in the brook). It was found that while the passage of the water filtered from it such things as flour, the salt came through, and with it bacteria.

The precautions to be taken are self-evident. The well or spring should be on high ground, higher than any of the possible sources of pollution if possible, and at least not lower than any of them. It should be provided with a tight covering or platform, and the upper several feet of its walls cased in cement to prevent the inflow of surface water; it should be far enough away from the nearest filth source to provide an ample intervening space of filtering soil. Twenty-five feet is sometimes given as the minimum distance. One hundred is safer because of the lessened liability of contamination along the surface of the ground, if for no other reason. Prof. William P. Mason has shown by actual tests that a cesspool on fairly level ground will spread contamination through the soil over an area of one hundred feet in diameter.

The usual way of making such a test is to dump into the cesspool or other suspected source of infection a large amount of common salt or a substance called flouresceín. If these substances are subsequently detected in the well water the certainty that it is being regularly polluted is manifest. Unfortunately, aside from this crude test, there is no simple method of certainly determining the wholesomeness of a water-supply. Water analysis requires extreme care and skill, and can only be satisfactorily performed in a special laboratory.

The farmer who is so skeptic about these new-fangled sanitary notions will perhaps ask to be "shown," before he spends money digging a new well or moving outhouses. He can try the flourescein test, but a negative result with it is by no means equivalent to a clean bill of health for the water. He can hunt up the nearest laboratory and have an analysis made. But one satisfactory analysis is no guarantee of continued wholesomeness. It may occur to him—if he is looking for excuses—that, as the water has never caused sickness in his family and has been used by it for, say twenty years, this is a pretty good proof of its purity. This, unfortunately, is also a fallacy. Until the cess-pool which is draining or soaking into the well receives disease germs itself it cannot pass them along with drinking water.



Will You Take Advice From Men In Your Own Business?

Looking over the various agricultural papers, it's pretty hard for any farmer—for you—to judge which is really the best Engine Gang Plow to suit the soil conditions in Western Canada, because every manufacturer claims his machine to be the best. Whose word then **will** you take? Turn to the man in the same business as yourself—a farmer—one who knows which plow is the most practical from actual experience in the field. Listen carefully to what he has to say—take his advice—buy the plow he recommends—he'll certainly guide you right. There are hundreds of such farmers in Western Canada whose names and addresses are included in our handsomely illustrated booklet on the

Write For The Booklet

COCKSHUTT ENGINE GANG

Be sure and send for it to-day. You'll find their letters there—sound, practical evidence from men who have used the Cockshutt Engine Gang under the severest conditions in Western Canada. Some of them probably live only a few miles from your own farm. Many of these farmers have sent us photographs of our Engine Gangs in operation and we have reproduced many of them in the book—absolutely the finest plowing scenes we have ever seen. If you intend buying an Engine Gang don't fail to get this book and read every page of it—then you'll learn the whole truth about which plow is really the best. Not manufacturers' **claims,** but positive proof from men who have been at the plow handles for years. Then you'll know why we have sold more Engine Gang Plows in Western Canada than **all other firms put together many times over.** Some of the reasons briefly stated are as follows:—

See The Cockshutt Dealer

STRENGTH—The amount and quality of the materials used in the construction of the Cockshutt Engine Gang make it the strongest Engine Gang Plow in the world—fit to meet all conditions.

ONE PLOW—ONE LEVER—Time has proved that our individual plow construction is the only complete success. Long before we put an Engine Gang Plow on the market we experimented fully and found that the "one plow—one lever' system was the best. It's all explained in the book.

STRAIGHT BEAMS—We use straight beams—not **arched** like some manufacturers. Arched beams are very liable to become **twisted** or partly straightened under heavy strains and **this** throws the plow bottoms out of alignment.

EXTRA HEAVY SHARES—Our shares—both breaker and stubble—are extra heavy—much heavier than any other make. Our 1910 stubble shares have been made heavier than ever

But get the Book—everything is explained there—and don't forget to read the testimonials. Write us to-day.

COCKSHUTT PLOW COMPANY LIMITED WINNIPEG

BRANDON REGINA SASKATOON CALGARY EDMONTON

130

Let some member of the family or the hired man or a visitor be taken down with typhoid fever. The deadly work of the cesspool immediately begins and those drinking the water may be infected.

The farmer, therefore, bearing in mind the fact that in the case of the water supply that an ounce of prevention is better than a pound of cure, should take no chances. If his well is not more than fifty feet from cesspool, outdoor toilet or other collection of filth, and on higher ground than any of these, he will dig a new well or move the contamination to that distance, and while about it he had best make the distance a hundred feet.

"The Cost of High Living"

Continued form page 7

loaf instead of 5c. and his daily paper tells him that it is due to the fact that the price of wheat has gone up and as wheat is the stuff of which bread is made, bread must accordingly go up. He goes to his butcher to buy a ham and he finds that the price has gone up from two to three cents a pound and if he is a close observer of commercial conditions he will in a great many cases find that ham has had a lively time on the Board of Trade recently. He kicks and protests and says that he won't pay it, but an empty stomach never knows the value of a dollar with the result that he buys because he has to.

Somebody corners corn with the result that the price goes up ten to fifteen cents per bushel. The feeder of hogs hesitates to put 60c. or 75c. corn into something unless he can see a profit and the first thing we know the price of pork goes up and the man who buys it pays for it.

A group of packers get together in a friendly chat around the council table and they agree that they are selling beef too cheap and that it had better be jumped two or three cents a pound. Beef accordingly goes up and the man who buys it pays for it.

And thus I might go on through one industry after another. The manufacturer will tell you that the prices are based wholly and solely upon the cost of production with a reasonable profit added and he will present you volumes of figures and apparent facts to prove his statement of the cost, but when we get right down to brass tacks we find that in the majority of cases there is generally a small body of men somewheres behind closed office doors that controls the situation and whose far reaching tentacles permeate into every nook and corner where trade is to be had, and whose word is generally law.

Canada has not felt the sting of these members of the Octopus family as much as the United States and there is as yet no great cause for alarm, but it is better to lock the barn door before the horse is stolen than to spend a large amount of money in tracing him up after he has gone. Canada is in a position at the present time where she can with a reasonable amount of effort and prudence keep the trust yet within the limits of the law and if she does not take a lesson from what has happened to our cousins on the other side of the line she can have no one to blame but herself.

The manufacturer of to-day will tell you that he does not make as much of a profit on what he manufactures as he did twenty-five years ago and he shouldn't. The volume of business itself to-day is out of all proportion to what was done twenty-five years ago; likewise the amount of the manufacturers turn-over has increased in like proportion. He is selling one thousand pieces of a manufactured article to-day where twenty-five years ago, he didn't sell one. The channels of trade and commerce have become so systematized and the facility with which business can be done is so great that the average manufacturer is able to turn his money over a great deal more quickly. True, that there are more manufacturing concerns in the field and competition is keener, but these same manufacturers have become a great deal more skilled in doing business and are thus able to cope with competition a great deal better than when it was not so keen. This is the manufacturer's side of "the High Cost of Living." Now, how about the consumer's side.

The manufacturer is by no means entirely to blame for the present state of affairs. Twenty-five years ago the equipment of the average man was small. Give him a house and lot, simple clothing and three plain meals a day and he was satisfied. The furnishings of this house were of the simplest and the food which he ate was in a great many cases severely plain, but it was healthful.

The average man of to-day is on an aping race with the rich. A plain house will no longer satisfy him; plain food will no longer tempt his appetite and plain clothes are an abomination to be scoffed at.

Take the case of the farmer. To-day he must have a $350 or $400 piano where twenty-five years ago a Jew's-harp was a thing to be prized. Twenty-five years ago the old Red River cart was a convenient means of travel, while to-day nothing satisfies him short of an automobile. Twenty-five years ago a twenty-five or fifty mile trip was a thing to be talked of for a year, while at the present time his eye is set upon a trip around the world. Twenty-five years ago his farm equipment did not represent an investment of over $500.00, while to-day nothing short of $2,000 or $3,000 is sufficient unto his wants. Twenty-five years ago the country boy or girl who went to college was a noted exception to the rule, while to-day the farmer's boy or girl who does not have some sort of a college or higher education, is looked upon as one who has not made use of his or her opportunities We find our farm homes to-day equipped with telephones, in some cases electric lights and bath room, large red barns with cement floors and expensive mechanical fittings, cement side walks about his farm, and everything else in proportion.

A Picturesque Scene in Holland

The same thing holds true of the average man in town. Twenty-five years ago one suit of clothes a year was considered sufficient unto his needs, while to-day three, four, five and in some cases a dozen suits go to pile up a large tailor's bill We will find on the table of the average man in Canada in January all sorts of tropical fruits and vegetables that are three and four months out of season. Where formerly a round steak was sufficient unto his needs, nothing will satisfy his appetite to-day short of a surloin. We find him occupying a box at the theatre where a few years ago a seat in the gallery was a luxury. We find him mortgaging his home to buy an automobile. We find that his wife has a regular schedule of pink teas for practically every day in the year and we find that he himself is a member of all the best clubs in town. We find him smoking ten and fifteen cent cigars whereas his father was satisfied with a clay pipe. We find his wife and family on an annual trip that runs into hundreds of dollars, whereas in the olden days such a trip could be nothing more than a semi-centennial affair.

All these things are laudable and are significant of an age of progress. They are indicative of an ambitious spirit on the part of the average man, but when reduced to the basis of dollars and cents, they cost money and are responsible in no small degree for the high cost of living. If we were to change the term and call it "The Cost of High Living" we would have discovered the cause of 75 per cent. of our expense troubles at the present time.

Continued on page 82

MAY

The Canadian Thresherman and Farmer

CANADA'S FARM MACHINERY MAGAZINE

PUBLISHED MONTHLY BY
E. H. HEATH COMPANY
LIMITED
WINNIPEG - CANADA

Members Western Canada Press Association

Authorized by the Postmaster General, Ottawa, Canada, for transmission as Second Class Matter.

E. H. HEATH
PRESIDENT AND MANAGER

E. W. HAMILTON
SECRETARY

F. C. BRAY
TREASURER

"Everything begins and ends with the soil"

1910

Be sure to renew your subscription before Western Canada passes through the tail of Halley's Comet on May 18th.

SUBSCRIPTION RATES

Postage prepaid, Canada and Great Britain, $1.00 Per Year.

Postage prepaid United States and Foreign Countries $2.00 Per Year.

Failing to receive paper, you should notify the office at once, when mistakes, if any, will be corrected immediately.

All Subscriptions must be paid for in advance and are positively discontinued at date of expiration unless renewed.

Advertising copy in order to secure good position should be in our hands not later than the 15th of the month preceding date of issue.

Advertising rates furnished on application.

BEGINNING with June The Canadian Thresherman and Farmer will inaugurate not a new department but will enhance the value of one of its old departments, viz., the Problems of the Farmer. We have already arranged with three prominent agriculturslists, one in Manitoba, one in Alberta and one in Saskatchewan; each of these agriculturalists to give us two problems every month of their particular province. These men, whose names will be announced in due time are thoroughly familiar with agricultural conditions existing in their respective provinces and will be able to furnish us and our readers with a large amount of valuable discussion on the problems that are the nearest to the heart of the different farmers.

We would like to suggest to our different farm readers that if they at any time have a particular problem that is bothering them, or over which they are worried, to let us know just what that problem is and we will turn it over to whichever of these men happens to be bestable to handle it and they in turn will give it a free and thorough discussion.

We hope to see an interest taken in this department, as it is costing us considerable money. We do not mind the expense if we can give our readers something that they want and we believe that before the end of six months that our readers will agree with us, that this is one of the nost important department in our magazine.

* * * * * * *

This is the season of the year when the good roads proposition should stir every man in Western Canada who has the spirit of progress within him. Good roads are the most valuable asset that any country can have and the wealth of the people within that country depends entirely upon the country's assets.

Western Canada is an easy country in which to build good roads. In the majority of cases we have good firm soil; the grades are easy, and all that is required is a little tact and labor to produce the finest system of roads anywhere in the world. Do not simply scratch along the top, filling up a few holes there and here, throwlng a stone out of the way there, but what you build, build well, and future prosperity will erect a monument to the fore-sight of that person.

* * * * * * *

As announced by letter, advertisement and otherwise this is the last opportunity which our subscribers will have of taking advantage of our Big Two Thousand prize Wheat Guessing Contest. This contest has been running since the last of Novemger and ends positively May 31st. During that time thousands of people in Western Canada have become readers of The Canadian Thresherman and Farmer, having sent in anywheres from one to ten dollars to become enrolled upon our subscription list. We want 5000 more subscribers in the month of May and we feel confident that we are going to get them.

We have done everything in our power to acquaint the farmers of Western Cnaada with The Canadian Thresherman and Farmer and while the results have been more than satisfacotry, nevertheless, we want 5000 more to get into line and become readers of our magazine. If everyone of our subscribers at the present time would just drop over to his neighbor's and induce him to send us in a dollar for a year's subscription we would not only double our subscription list, but everyone of our subscribers at the present time would get an opportunity of recording an extra guess. Remember, there are two thousand prizes to be distributed and the chances are a hundred to one in your favor that you will get something for your trouble.

* * * * * * *

We cannot agree with those who think the country child should have very different training from the child of the city, nor that the higher schools with the languages left out, should not eventually come to all farming districts by way of the centralized school, or otherwise. With the fast improving roads, automobiles, etc., it is going to be only a question of time when most country children can receive a good common education without leaving the farm over night.

It is only too true, though, that all too long our schools have been planned and courses of study been arranged to lead to the university, where not three in a hundred ever get, and all too little attenion has been paid to fitting boys and particularly girls, for life.

We are not so sure either that city schools should train city children for city life. The country boy and girl get something of the business of country life into them by contact, whether taught in the schools or not, while the city child will get too much city life regardless of how much of the other life they may be taught. All too many city people would be in the country today instead of starving, or living from hand to mouth on wages that must come from another, did they have the faintest idea of how to grow a garden, or a potato patch. City girls, as a rule, though graduates of colleges, know all too little about real home science, particularly when that includes knowledge of fruit and garden procucts and how to get them out of a garden and onto the table. They certainly need Home Science even more than the country girl.

Again it is well for the country boys and girls to have the agricultural college in mind, but so few do, or even will get there, we do not believe the fact that they may, should influence their line of studies in the common schools. As so few, so very few ever get beyond a common school, let that school so far as possible be complete in itself. The country child should go to school as much as the city child, and when he is robbed of his schooling to hold the plow before he is as high as the handles, as some children are, something is wrong with the parents, or with the school board, or both. There is no more excuse for the country child being robbed of its schooling to work in the field than for the city child to leave school to sell papers or run chores.

As a rule the work a child on the farm does outside of school does him good, but not when he is robbed of the child's greatest and most sacred right, a full common school education.

Country high schools, centralized schools, singing schools, with time to attend them, will largely take the place of other social advantages with good, bright illustrated papers and magazines of their own, coming in their rural mail, there would not be nearly so many of them running away to the towns and forever hating the land.

Your Time Has Come

to secure the labor, time and money saving attachment shown below if you want to retain your position as the leading Thresherman in your community. The farmers are demanding a first class carrier and the scarcity of labor makes them a necessity. Many Threshermen have them and are saving money and doing more and better work with a less number of men.

Knowing the needs of the Threshermen and realizing the growing demand for a first class wing carrier, we offer you the Hart-Brown attachment as a machine that is better and stronger, yet lighter, than others, and one that will meet all demands made on it.

Ask for illustrated booklet giving full description.

Hart-Brown
Wing Carrier

Hart-Brown
Wing Carrier

The designer of this carrier has provided an excess of strength, yet the design is such and the metal so distributed that its weight is about 250 pounds less than any other swinging carrier.

Hart-Brown Wing Carriers are not an experiment, as a number of them were placed on different makes of separators last year and the tests made show that this carrier will dispense with the service of from two to four pitchers in stack or barn threshing, and from four to six teams in shock threshing.

The Hart quality is put into every one of these carriers, which is in itself a guarantee that the machine is first class in every respect.

Will Fit any Separator and can be Used With any Feeder Without Alteration of Either

The carrier rests at all times on it's own frame work, which is attached to the main sills of the separator, the strongest and most rigid part of the machine.

Has no overhead derrick or support to the ground to interfere with moving or take up time in setting.

Carriers are fifteen (15) feet---the longest made---and 32 inches wide at top; they are raised and lowered by a screw operated by a reversible handle and are swung about by a small crank, which may be operated from either end of carrier.

The majority of the castings are malleable, the balance being a high grade grey iron, all chain is No. 55 or heavier, the carrier troughs are galvanized iron and sufficiently strong to stand much more strain than is put on them.

All bearings except the counter shafts, are oilless and require no lubrication or attention during the life of the carrier.

SOLD BY ALL THRESHING MACHINE COMPANIES

Manufactured by Hart Grain Weigher Co., Peoria, Illinois, U.S.A.

The Importance of the Farm Machine upon the Farm

By JAS. H. BRIDGE

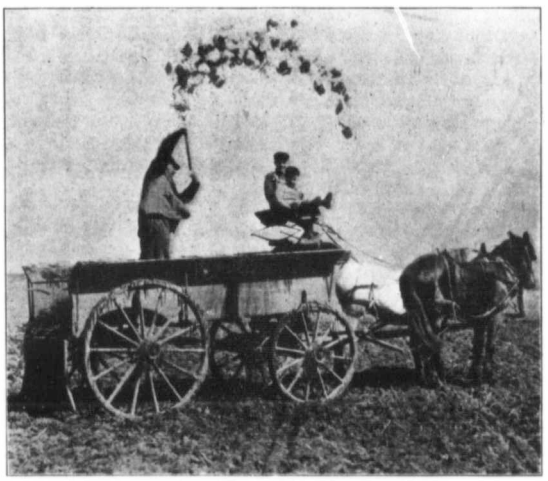
First Prize Essay by 2nd year Student in "Canadian Thresherman and Farmer" Prize Contest at the Manitoba Agricultural College.

GENERALLY speaking, the importance of the farm machine is not fully recognized, either by farmers or those engaged in other lines of business. It is my intention in writing this article to bring to the reader's notice a few of the more important benefits derived from the use of modern farm machinery.

Success in agriculture, as in any other manufacturing concern, depends primarily on obtaining the maximum of results at a minimum of cost and this desirable condition of affairs is being achieved by farm machinery. In no other part of the world has the introduction of farm machinry been so rapid, and nowhere else is it so extensively used as in North America. To this cause is largely attributable the fact that the North American farmer is in the foremost ranks of the agriculturalists of the day.

In reviewing the history of agriculture we are astonisned to find that almost all the important improvements along the line of farm machinery have taken place since the beginning of the last century, and much of it since the middle of that century. As late as the year 1845 the people of the United States did not raise enough wheat to supply their own needs for bread, and by far the larger portion of the population were engaged in agriculture. In 1904 with only about one-third of the population employed on the farms, they not only raised enough for themselves but exported almost $1,000,000,000 worth of farm produce. While this is partly accounted for by the opening up of large areas of virgin prairie, and to the progressive spirit, intelligence, and industry of the American farmer, it is chiefly due to the introduction of new and improved types of farm machinery By the use of machinery the cost of production was greatly reduced, enabling the products of the American farmer to favorably compete in the world's markets with the products of the poorly-paid, ill-nourished laborers of Russia and India, where the old-fashioned methods of centuries ago were still in vogue, as they are to-day to a large extent.

The importance of the farm machine will become ever more apparent in the future than it is at present, because it is only by the use of improved farm machinery that the cost of production can be reduced. To illustrate what has already been accomplished in this direction: Only 80 years ago it required 3 hours labor to produce one bushel of wheat, at a cost of about 20 cents, while to-day it takes less than ten minutes, the value of the labor being under 10 cents. Not only has a gain in time and cost of labor been secured, but the amount of manual labor involved has been reduced to a very small fraction of what was previously necessary. The same is true of all other farm crops. Take, for instance, the hay crop. Formerly it required 11 hours labor to cut and cure one ton of hay, at a cost of 83⅓ cents, but the same amount of work can be done in 1½ hours, at less than one-fifth of the previous cost.



An expensive method of spreading the manure crop

When we consider the number and variety of the labor-saving machines which are now at the disposal of the agriculturalist, the already long list of which is being constantly augmented by the inventive genius of the implement manufacturer, it seems difficult to realize that most of this development and improvement has taken place in the last 50 or 60 years. Comparatively recently farm work was performed mostly by hand, the plow and spike tooth harrow being practically the only implements drawn by animal power. Wheat was sown broadcast by hand and covered with the spike-tooth harrow, while corn was dropped in furrows and covered with a hoe. Reaping was accomplished with the aid of a sickle and the cradle, the sickle being almost identical with that used in the days of early Biblical history. There are many men still living who have cut grain with the sickle and cradle. Such methods would be impossible under present conditions; on the western prairies especially, wheat must be harvested very quickly after it is ready to cut, as it is liable to be badly beaten out by strong winds. Hence, without the modern self-binder, the wheat crop would have to be limited to such an area as could be reaped by hand in a few days.

Expensive but still effective

The introduction of the self-binder gave a great impetus to agriculture in North America. Previous to this time there had been no need of the many different types of machinery such as grain drills, cultivators, etc., which are now so indispensable. The coming of the self-binder, however, marked the beginning of a revolution in farming methods. The grain acreage increased by leaps and bounds, because the chief limiting factor had been overcome. As a consequence a new industry sprang up in the attempt to furnish the machinery which it was found could now be used with economy, and to-day the manufacture of farm machinery forms no inconsiderable portion of the industrial activities of the nations, especially in the United States and Canada, whose farmers are the largest users of farm machinery in the world. The opening up of large fertile areas in the West and the increasing scarcity of farm laborers, coupled with the fact that the produce of the American farmer had to compete in the European markets with that produced in the older lands where labor is plentiful and cheap, have made the continuous introduction of more efficient farm machinery absolutely necessary.

With the advent of modern farm machinery railway development took on new life. It has often been said that the railroads have made the development of the American continent possible. We maintain that it is the settlement of the country which has made the railroads possible. Settlement has always preceded the railroads to at least a limited extent, and they are built and maintain their existence chiefly because they are necessary as carriers of farm produce and of the manufactured goods which the farmer requires. The opening up of these lands and the consequent railway development could not have taken place without the help of the modern farm machine. Hence, we contend that farm machinery is largely responsible for the progress which has been made on this continent during the last half century; and the end is not yet. Farm machinery is destined to play an increasingly important part in the progress and advancement of the people.

In many countries there are large tracts of land which can only be subjugated and profitably cultivated by the use of special tillage machinery. Take for instance, the arid and semi-arid regions of the western States and Provinces. It is computed that one-third of the area of land capable of cultivation in the United States is in the semi-arid region, and it is freely acknowledged that the greater part of our own western provinces has not enough rainfall to mature a full crop of grain each year, except under a very efficient system of moisture conservation. On parts of these arid and semi-arid lands irrigation will be practised, but the major part must necessarily be subdued and rendered profitable by the use of such implements as the engine plows, sub-surface packers, sub-soil plows, cultivators, etc., under the methods which are now known as the dry farming system. Similar

conditions exist in other countries, notably the Argentine Republic and South Africa. The latter country, which was so recently the scene of bloodshed, is now being broken up by specially constructed plows, which stir up the subsoil to a great depth, thus preparing the land to retain the heavy rains which fall periodically, for the use of succeeding crops. In view of our contention that America leads in the manufacture of farm machinery, it is interesting to note that the farmers of South Africa, when about to purchase their farm machinery, came and placed their orders with American firms. Also, John Foster Fraser, in his book on Siberia, mentions the fact that most of the machinery going into that country was of American origin.

A brief review of the history of some of the more important farm implements will probably be interesting.

The plow is the basic tillage implement and is the most important one on the farm, and we should probably not err if we described it as the most important implement on the face of the earth. Its evolution forms one of the most interesting chapters of agricultural history. From the crude affair of over 4000 years ago it has been developed, until, to-day, it would appear to be about as perfect as it is possible to make it. The early plow was only a modification of the hoe of that day and consisted of a crooked stick of such a shape as to penetrate and loosen the soil to a slight extent as it was drawn along. For a while man furnished the necessary power, but soon learned to use the beast of burden which he had been able to train. Such a plow was used by the Egyptians, and pictures of farmers plowing are found among the oldest records of that wonderful people. They improved the plow until it possessed a beam, a shank, and a handle. The next improvement was to provide the wearing parts with iron, and as an indication of the early time at which this was done we find in Holy Writ the following words: "Now, there was no smith found in all the land of Israel, but all the Israelities went down to the Philistines to sharpen every man his share, and his coulter his ax, and his mattock." This was just about 3000 years ago.

The Romans were among the first to develop the plow to any extent, and the Roman model remained the standard for a long time, very little improvement being made during the middle ages. After this, the Dutch, owing to the peculiarities of their soil, were led to make important changes in the Roman type of plow. Some of these Dutch plows were imported into England where they were further improved, until the greater part was of iron. About the beginning of the 19th century improvement began to take place rapidly. In 1803 Robert Ransome, of Ipswich, England, was granted a patent for case-hardening and chilling a share, which proved very effective, and a decided advance on anything which had been done previously. Ransome established a manufacturing plant for the building of his plows, which still bear his name, and is one of the largest farm machinery plants in England.

Although English inventors have done much towards perfecting the plow, it is a noteworthy fact that America can claim the honor of making the plow the highly efficient and almost perfect implement that we now possess. When the introduction of the harvester made it possible to grow larger areas of grain, the need of a more rapid method of plowing became apparent, and indeed, necessary. To meet this need, the gang plow, consisting of two or more plows fitted on one frame, was produced, and by its use one man, using a larger number of horses, could do as much work as two or more men had been able to do with the walking plow. Very soon wheel plows were introduced and they may now be found with 3 or 4 bottoms on the same frame. The two-furrow gang plow is the one most generally used in the West and is a handy size, being just about right for four horses in the average soil. Most of these wheel plows are now fitted with seats, and as the draft is a very little more with the operator riding than it would be were he walking, there is an evident advantage in having him ride because he can handle the plow levers much more successfully, although the present high-lift type needs no manipulating with the hands after the correct depth is obtained. In addition to this the weight of the driver has a steadying effect on the plow frame. In the wheel plow the landside is largely dispensed with, thus reducing the friction from that source, and the existing friction may be lessened by setting the rear furrow wheel about an inch outside of the line of the landside.

With the introduction of steam and gasoline traction engines as farm powers, has come a demand for an efficient, yet simple and durable, engine gang plow, and the manufacturers have not been slow in responding, so that we now have a number of really good engine gangs, varying in size from those with 3 or 4 to others having 20, 14-inch plows in a gang. With some of these as much as 60 acres per day can be plowed, while in California may be seen huge outfits propelled by a 110 horse-power steam traction engine, which plow, sow, and harrow 80 to 100 acres per day and do it much more cheaply than with horses. Later, this same engine may be seen drawing a combined harvester and thresher—this joint operation being made possible by the dryness of the atmosphere—cutting a swath up to 40 feet in width, threshing and cleaning the grain, and delivering it into bags which are dumped in piles on the stubble. After the harvesting is finished the traction engine is used to collect the grain and haul it to market.

OWN UP YOU

YOU'D be money ahead to-day if you had bought a *Case* outfit when I did.

You know we talked it over together and we agreed that the *Case* outfit was the best one to buy. I bought one. I've made a nice, fat profit each year and my machinery is still as good as new.

Each spring you've hesitated and put it off until it was too late and you've cheated yourself out of many dollars that you might just as well have had.

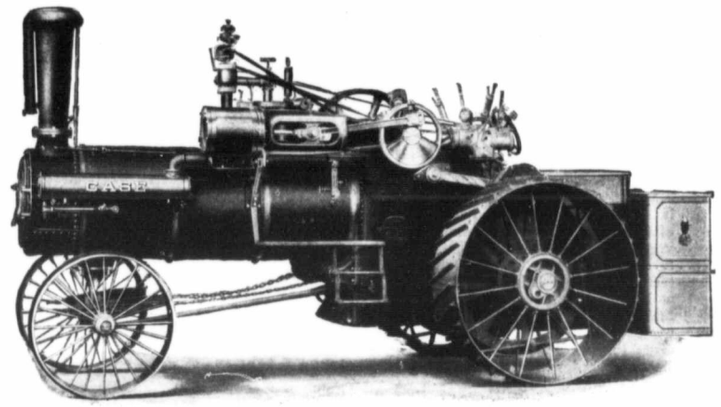
I've just seen the new *Case* catalog and the 1910 machinery is better than ever.

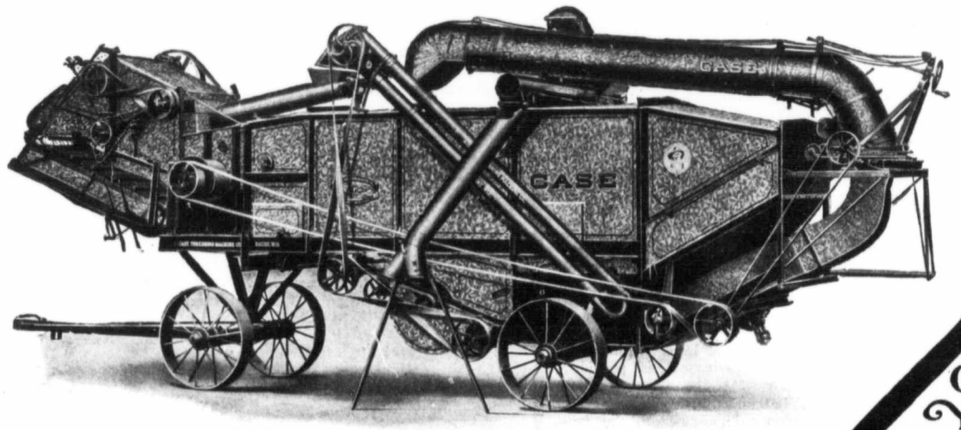
Come friend, don't stand in your own light any longer. Ask *Case* to send you a catalog. You cannot lose—if you buy a *Case*. On the other hand, you can make more money with a *Case* threshing rig than any other business that is open to you.

J.I.CASE THRESHING MACHINE CO. INCORPORATED
RACINE WIS·U·S·A·

TORONTO, WINNIPEG, REGINA, CALGARY

TO IT — KNOW IT'S TRUE.





ORDER YOUR SUPPLIES ·NOW·

OUR "CASH WITH ORDER" SUPPLY CATALOG IS A GREAT MONEY SAVER· IF YOU HAVEN'T ONE— ASK US TO SEND IT TO YOU·

Although it is improbable that such machines will be used in the Canadian West owing to the different climatic conditions yet we believe that the near future will see a great development along the line of mechanically propelled farm machinery. We do not wish to suggest that mechanical power will do away with the horse, because history goes to show the folly of such a statement. For instance: When the automobile began to be used in place of the horse, it was freely predicted that we were approaching the horseless age and that the noble horse, as a draught animal, would soon disappear from the streets. These fears and predictions have not materialized, and there never was a time when horses were in greater demand than they are to-day. Mechanical motive power, instead of displacing the horse, is but serving to lighten his labors by performing many of the heavier tasks which were previously performed by horses, and is thus exerting a humanizing influence.

The internal combustion engine seems destined to become the farm horse for the future to a large degree. It is already being used to a considerable extent on the larger farms, and it will be but a short time until we have engines suitable for the smaller farms. Owing to our lack of knowledge of the principles governing the working and operation of the explosive or internal combustion type of engine, we have regarded them, in the past, as a somewhat unreliable power, but as we learn to understand them properly, we become more amenable to the idea of using them. This type of engine is no longer an experiment, but has proven its adaptability to farm conditions, whether as a stationary, portable or traction power. They are much safer in the hands of the amateur than is the steam engine, and there is practically no danger from explosion, one of the noticeable features of these engines being that they refuse to go unless conditions are just right. Hence we believe that the internal combustion engine is going to be used largely in farm operations.

In speaking of engines one is reminded of a very important piece of farm machinery, viz., the threshing machine. Up to the year 1850 flailing was the common method of threshing grain, although some was threshed by spreading on a floor and causing animals to tread out the grain. The flail was simply a short club attached to a long handle in such a manner that it could swing freely. It was swung by hand and flailing was very laborious work. When the grain had been beaten out of the head or ear, the straw was carefully raked away and the grain separated from the chaff by throwing it into the air and allowing the wind to carry away the chaff. An average day's work with the flail was about 7 bushels of wheat: thus the threshing of a few hundred bushels of grain would occupy the whole winter. Compare that with present day work. Many of our modern machines will thresh over 2000 bushels of wheat in one day, and over 5000 bushels of oats have been threshed in the same length of time. These machines are equipped with many labor-saving devices, such as the wind-stacker (which does away with the handling of the straw), the self-feeder, bagger and weigher, etc. Thus a great saving both in time and labor is effected by the modern threshing machine.

We have not space to discuss the importance of all the various farm machines in their relation to the farm and the farmer, but perhaps it would be interesting and profitable to glance briefly at a few of them. One of the chief effects of farm machinery, and one which appeals most strongly to the man who is doing the work, is the extent to which it reduces hand labor. In days gone by the holding of a plow required the exertions of a strong man, although the pulverizing action of the plow was but small. The walking plow of to-day, practically no exertion on the part if correctly adjusted, requires of the plowman except in guiding it, while the amount of pulverization is large, owing to the peculiar turn or twist which is given to the moldboard. If it is a wheel plow the operator may ride, and the work done is the equal of, and often superior to, that done with the walking plow. Harrowing, that most tiring and wearisome of field operations, has been rendered much easier by the introduction of the harrow cart, in fact, nearly all farm implements are now provided with seats. Many grain drills, in preference to the seat, are provided with a foot-board, which is placed in such a position that the operator is able to watch the grain spouts while riding, and also step on or off quite readily.

The disc harrow has proved a great labor-saver. By its use, the new settler, bringing into subjection the tough sod of the virgin prairie, which is filled with the roots of many years growth of grasses, has been able to accomplish as much in a few days, in the matter of pulverization and disentegration, as his ancestors could have done by many weeks of labor, without the aid of the disc-harrow. Not only this, but the work would have been accomplished much more easily, at least for the man, as the disc-harrow is provided with a seat.

The cultivator, also, is of great economic importance to the farmer, outside of its value as a labor-saver. The broad-shared cultivator has proven a great help in dealing with perennials, which, from their habit of spreading by means of underground rootstocks, were very difficult to eradicate.

The manure spreader, too, is an important farm machine, and one which, we belive, will soon become indispensable to the farmer who has manure to spread. It will enable him to spread the manure any desired thickness with certainty, avoiding the patchiness which is the almost inevitable result of hand-spreading, also rendering the work much easier. If the spreader is used it is possible to cover more

ground with a given amount of manure, and it has been demonstrated that the best way to apply manure is in frequent light dressings rather than heavy applications less frequently.

Consider the difference between the present day system of putting up hay and that in vogue before the advent of modern farm machinery. The mower has now quite superseded the scythe, and how much pleasanter it is to sit on the seat of a mower, listening to the fascinating hum which is so characteristic of that machine, and watching the beautiful grass as it falls over the cutter bar, with no sound to break in upon one's reverie save the click, click, of the ratchet as we turn a corner. How much more pleasant this is than to swing a scythe all day long, with a bended back and bowed head, and the persiration pouring from every pore in the body. In many cases to-day, the hay is never handled with a pitchfork at all unless it be to build the load as the hay is delivered by the hay loader. It is cut with the mower, shaken out with the tedder, drawn into windrows with the horse-rake, loaded with the hay-loader and stowed away in the mow with the fork or sling attached to the hay-carrier. Thus the whole operation is performed with a minimum amount of hand labor.

The cream separator has been a boon to those engaged in the dairy industry, being a great saver of both time and money. It has saved money directly in reducing the loss of butter-fat in skimming. Where the farmer is patronizing a creamery the cost of hauling the milk serum to and from the factory has been saved by separating the milk at home and sending only the cream; which gives the additional advantage of having the sweet skim-milk to feed to calves or pigs.

There are many other machines found on the farm whose importance and value cannot be considered here. Enough has been said however, to indicate to some extent the importance of the farm machine in the farming operations of to-day. It has also done a great deal towards raising the social status of the tiller of the soil. Formerly he was regarded as a serf but is now looked upon as a respected member of the community, and is coming to be the social and intellectual equal of those engaged in other professions. The work which is being done by our agricultural educational institutions is largely responsible for this desirable state of affairs. Modern farm machinery, coupled with scientific agricultural education, is going to attain to greater achievements than we have ever dreamed of. Already we see its wonderful possibilities being displayed. Huge tracts of land which were considered out of the cultivable area on account of lack of moisture, are now being properly cultivated by the intelligent use of suitable machinery. Land which previously required from 10 to 20 acres to feed one steer or cow, under range conditions, is now made to produce large crops of wheat, etc., of a splendid quality. It is often said that he who causes two blades of grass to grow where but one grew before is a human benefactor. Truly, then, the farm machine is worthy of a high place in our esteem, because it is the means whereby not only two, but many blades of grass have been made to grow where but one grew before.

Although so much has been done in the past there is still a vast field open to the inventor and improver of farm machinery. We will mention one case, which is indeed an important one: that of the machine stooker or shocker. This subject is of special interest to those who are growing large areas of grain crops, and is one to which considerable attention is being paid at present. Several stooking machines have been patented but so far, none seems to exactly fit the needs. Farmers are looking for an automatic stooker that will stook the grain without any help from the man operating the binder, or any other person; so that they may be able to cut and stook their grain without any extra hired help. They do not mind putting on an extra horse if it is necessary, but find it often impossible to get men in harvest time. The harvest help problem is a very serious one to Western farmers, and is likely to become more acute for some years yet. An automatic stooker, if successful, would be an inestimable blessing to the grain grower, and would reap a fortune for the inventor.

We would like to emphasize the important part which the farm machine has played in the bettering of the conditions generally. It has raised the standard of living by cheapening the food-stuffs, and at the same time has lessened the cost of production to such an extent that the profits accruing to the farmer are greater now than ever before. It has caused the wonderful development of this Western Hemisphere of which we are privileged to be witnesses. It has made possible the wonderful growth of the manufacturing industries, by releasing a vast number of workers, who would otherwise be necessarily engaged in farm work helping to produce the required foodstffs.

Its greatest benefits, however, have undoubtedly come to those engaged in agricultural pursuits. It has greatly increased the material prosperity of the farmer. It has relieved him of much of the drudgery connected

with farm work, shortened his hours of labor, and stimulated his mental faculties. Brawn is no longer the necessary qualification of a farmer, because farm machinery gives an equilibrium of effort to mind and body, making the laborer a more efficient worker, a broader minded man, and a better citizen.

The weaker sex on the farm has also benefited greatly by the introduction of farm machinery. While hand methods were in vogue woman was required to help with the most strenuous of farm operations. Now she is relieved of most of this work, besides which, many of her former household duties have also been taken away. Spinning, weaving, candle-making and soap making, which were formerly part of woman's duties, are now turned over almost altogether to the factories, the workers for which are supplied from the ranks of those whom the farm machine has liberated from the farm. Butter and cheese making, also, are now largely the work of the creamery and cheese-factory, and this is much the better way, both for the woman on the farm and the dairy industry at large. Here we are again reminded of the benefits derived from the cream separator. Previous to the invention of the cream separator, the setting and skimming of the milk was a task of considerable magnitude on those farms where a number of cows were kept, and, of course, fell to the lot of the farmer's wife. At the present time the work is done much more speedily and efficiently by the use of the cream separator, the power for which is usually supplied from the male side of the house, or, as is sometimes the case, by a gasoline engine or tread power.

Thus, the life of the woman on the farm has been made pleasanter and more desirable by the farm machine, giving her more time and strength for those tender and befitting duties which fall to her by reason of her sex. This, in itself, should tend towards the development of a stronger race, physically and mentally. We honor and revere the memories of those loving mothers who have borne the cares and burdens of by-gone days, many of them doing a man's work in the field, as well as attending to their multifarious household duties, and who, in spite of all this, have sent into the world such noble sons and daughters; we do, indeed, cherish their memories, but we also hail with joy these better days in which our wives, our mothers, and our sisters are freed from many of these duties, largely through the influence of farm machinery.

The more we consider this question the more firmly we become convinced that the farm machine as found upon farms today, has done more than any other single force towards the progress and welfare of the nations of the earth as a whole, and the inhabitants of this Western Hemisphere in particlar.

"Pay Dirt" in the Yellowhead

Half a dozen young men, ex-army officers from France, it is said, are entitled to the credit of first unearthing the vast coal beds near the Yellowhead on the Grand Trunk Pacific. This coal is equal in point of quality to that of the Crow's Nest, of Vancouver Island, of Sidney, Nova Scotia, and the bituminous coal other veins or stratas below and find is at the head waters of the McLeod, Pembina and Embarras Rivers. Not only is the quality of this coal good but there is an abundance of it. Experts estimate that there is eight hundred million tons in sight. The principal vein as tested and analyzed is 28 feet thick, with two or three other veins or stratas below and underlying the main vein. If builders of the Grand Trunk Pacific could have ordered the placing of these coal deposits they would in all probability have placed them just where they are, near the summit of the Rockies on the Eastern slope. From the mines it will be generally down hill to Winnipeg and all the prairies, although, as a matter of fact there are no grades on the National Transcontinental Railway. In the year 1908 one million tons of Pennsylvania coal went into the West. With the completion of the Grand Trunk Pacific the West will have not only an abundance of coal but have a quality of coal that can be stored in the summer before the crop begins to move; also it will supply the much desired return load for the cars that will carry wheat from the Prairie Provinces to Prince Rupert.

The line will be completed and in operation to the Pass by the end of the year. As a spur line of only twenty miles will take them to the mines the West should be getting this coal in a year from now.

This discovery is important to the whole country. It will enable the manufacturers to establish in the West and will help the economical operation of the railways.

Since the turning of the first sod on the construction of the Grand Trunk Pacific Ry., at Fort William, Ont., September 11th, 1905, by the Premier, Sir Wilfred Laurier, the construction work has proceeded steadily to the extent that at the present time, covering a period of four years and a half since the building of the Transcontinental Railway was commenced, of the entire main line from Moncton to Prince Rupert, a distance of 3,550 miles, a total of 2,000 miles has been placed under construction, on which there has been laid 1795 miles of track which in some cases is made up of disconnected sections, therefore not all continuous. That portion of the line, however, from Winnipeg to Edmonton, a distance of 793 miles has been constructed and has been in partial operation by the construction department for

the past 18 months, and within the past 90 days the track has been completed continuously westerly from Edmonton to Wolf Creek, 122 miles, thus completing the track laying on that portion of the line designated as the prairie section, Winnipeg to Wolf Creek, 915 miles. The track was also recently completed to Fort William, thus making a continuous line from Fort William via Winnipeg and Edmonton to Wolf Creek, 1,360 miles, which, however, cannot be completed for practical operation for some months as considerable work is required to be done on the easterly and westerly ends of the line, to put it in a suitable condition for the operation of regular trains. The other portions of the main line on which the rails have been laid are situated east and west of the City of Quebec. During the past year contracts have been let for the construction work from Wolf Creek, Alberta, westerly to Tete Jaune Cache, in the Rocky Mountains, 197 miles, and there are at present engaged in this section of the line 1,000 teams and men. Similar forces are also engaged on the construction of the line from Prince Rupert to the terminus of the Pacific Coast, easterly to Alderemere, B.C., 240 miles.

In addition to the mileage referred to above the Provincial Governments of Saskatchewan and Alberta passed acts in the sessions of their legislatures in 1909 authorizing guarantees for the construction of branch lines by the Grand Trunk Pacific Railway Company in these provinces, to the extent of 680 miles, comprising branch lines from the main line of the Grand Trunk Pacific Railway to Yorkton, Regina, Battleford, Calgary, Lethbridge, Macleod and Coutts, the construction of which is at present under way. At the session of the Saskatchewan Legislature in December, 1909, an act was passed authorizing the guarantee of the construction of additional lines by the G.T.P. in that province to the extent of 475 miles, comprising lines westerly to Moose Jaw, Calgary, etc., southwesterly to the United States boundary line, and from the main line of the Grand Trunk Pacific to Prince Albert, and the construction of these will be undertaken during the present year. From the foregoing it will be observed that out of a total mileage of main line and branches of approximately 7,900 miles, there are completed and under construction at the present time approximately 4,800 or sixty per cent. of the entire mileage authorized by the company's charter.

The little daughter of a clergyman stubbed her toe and said, "Darn!"

"I'll give you ten cents," said her father, "if you'll never say that word again."

A few days afterward she came to him and said:

"Papa, I've got a word worth half a dollar."

An Indication of Progress

Recently we came across the following interesting notice:

"HELP WANTED
AT
CHARLES CITY, IOWA
Carpenters
Masons
Plasterers
Cement Workers
Machinists and
Common Laborers

Can find employment at
Good Wages

Several hundred houses under construction, and a new railroad, call for hundreds of men. The Hart-Parr Company can use hundreds of Machinists and Laborers, and give them employment the year around.

Charles City is Booming"

There is far more to the above than what appears on the surface. Not many years ago, in fact so few that it seems but yesterday the editor of this magazine had occasion to look up the Hart-Parr plant which was then located at Madison, Wisconsin. It took considerable search to find it as it was merely a dingy metal sided building located in a marsh where the concern were turning out a few small stationary engines of the oil-cooled type. But Messrs. Hart and Parr saw bigger things ahead. They realized that gas power on the farm was a coming thing and they got into the game when the idea of a gas tractor was so new as to bring forth considerable skeptical comment from those engaged in the manufacture of steam traction engines.

The Hart-Parr Co. later moved to Charles City, Iowa, where they began the manufacture of gas tractors almost exclusively. It was an up hill task. The farmer had to be educated up to the gas tractor before he could be induced to purchase, but the men behind the Hart-Parr Co. were made of the stuff that always wins and win they did. When the Company went to Charles City it was a mere hamlet in northeastern Iowa. Today it is a thriving city that boasts of several large manufacturing establishments. Through Hart-Parr gas tractors it is known the world over for the Hart-Parr Co. in building up its magnificent establishment (an illustration of which has appeared in a previous issue of this magazine) has at the same time built up Charles City.

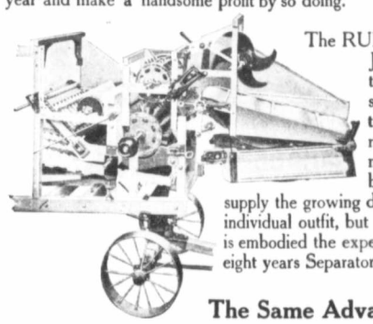
The Hart-Parr Company were pioneers in the gas tractor business. Through advertising, through building successful goods and through keeping everlastingly at it they have succeeded in stirring up such a wave of public sentiment in favor of the gas tractor that we sometimes wonder where it will end. If the gas tractor continues to grow in public favor as it has in the past the man who writes the history and development of farm power in some future generation will look to the Hart-Parr Co. for much of his material.

Just What You Want For Individual or Gas Engine Outfits

"I have used nearly all of the leading machines, but I must say that the Rumely Ideal is by far the nicest, smoothest and best running separator I ever handled."
JONES BROS., Blankington, S. D.

THE RUMELY Ideal Junior Separator is just the thing for farmers who wish to own individual outfits or for use in connection with internal combustion engines.

Owners of kerosene, gasoline or oil engines—here's ***your*** opportunity to utilize ***your*** engine thirty to sixty days more each year and make a handsome profit by so doing.



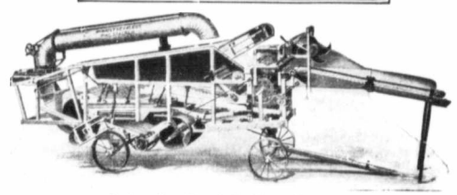
The RUMELY Ideal Junior is not a toy or makeshift. It is not thrown hurriedly together nor cheaply built simply to supply the growing demand for an individual outfit, but in its design is embodied the experience of fifty-eight years Separator building.

The Same Advantages

Of strength, durability and simplicity for which the RUMELY Ideal Separator is so well known are embodied in the RUMELY Ideal Junior Separator. It is constructed exceptionaly low, hence it is just fine for barn threshing, made in one size—24 inch cylinder, 40 inch rear. ***It is small,*** but its capacity is ***proportionately big.*** It is economical in power, time and labor. It needs only a trial to prove itself a grain saver and money maker—a profitable investment.

Send for Catalogue No. 58 and study its points of advantage

"I am running two outfits this year—a—— and a Rumely. Both are the same size and threshing in the same locality and same kind of grain and with the Rumely I can book from $15 to $20 more a day with only $4 more expense, two extra men to pitch bundles."
ROB EVANS, Lake Beriton, Minn.

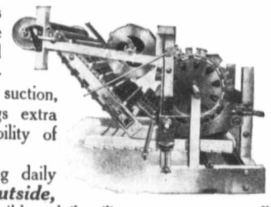


Skeleton View Rumely Ideal Junior Separator

FOR A BETTER SEASON'S RUN

"Mr. V. R. Selles has this day finished my threshing with the Rumely Ideal Separator purchased this year. He has done the best job of threshing we ever had done on the place."
H. F. BRANDT, Parker, S. D.

RUMELY SEPARATORS

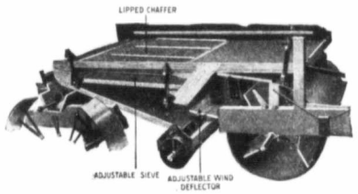


Will make a better season's run for ***you,*** because the feeder is automatic and positive in its action, cylinder large and of excellent suction, side plates rigid, bearings extra long reducing the possibility of overheating.

All bearings needing daily attention are ***on the outside,*** working parts always accessible—daily oiling an easy matter, all adjustments so arranged as to permit of changes while the machine is in operation. All of which saves time, power and labor and that's just so many dollars added to ***your*** profits.

The Inclined Chain Rake

After passing over the chain rake, ***nineteen out of every twenty kernals*** have fallen into the grain pan. Once in the grain pan, it only remains for the grain to be thoroughly cleaned. The lipped chaffer, adjustable sieve, adjustable wind deflector, smooth even throw of the entire shoe takes care of this—and the grain reaches the sack in a ***clean, ready-for-the-market*** condition—meaning for the thresherman a satisfied customer, more customers and more profits.



Send for Catalogue No. 58

Use the Coupon

"The separator is easy to keep up in good running order from the fact that the working parts are all where the separator man can see them—he does not have to go inside of machine to oil or to adjust anything as there is nothing inside to look after."
KROEKER & PAULS, Inman, Kan.

M. RUMELY

REGINA,

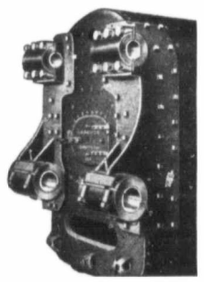
DISTRIBUTING WAREHOUSES:

Home Office and Works 1951

FOR A BETTER SEASON'S RUN

"The engine simply cannot be beaten; it handles so easy and runs so smooth and consumes less fuel and water than any other make of engine I have ever run."
O. A. SCHAEFER, Linton, N. D.

RUMELY ENGINES

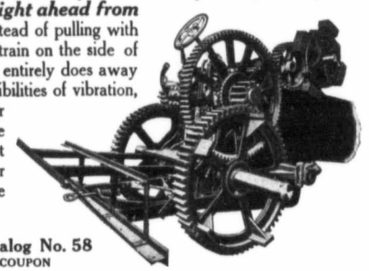


Will run many, many seasons. Each season's run will be profitable, because RUMELY Engines have boiler construction with full water circulation fire box construction, large heating surface area. Gearing made of steel and semi-steel, massive in size and design. Traction wheels built of steel are strong and broad and have large heavy grouters that grip the earth firmly.

Rumely Engines are Rear-Mounted and Double Geared

These features very materially lengthen the life of the engine as they are important factors in reducing friction and saving power and power savers mean **profits for the thresherman**

This construction permits of the power ***pushing the engine straight ahead from the rear*** instead of pulling with a damaging strain on the side of the boiler and entirely does away with the possibilities of vibration, side play, or twisting of the countershaft and sagging or tipping in of the drive wheels.



Send For Catalog No. 58
USE THE COUPON

"The engine is a dandy steamer and a fuel saver, a good puller in the belt and on the traction. We have averaged 2,000 bushels per day this season."
SOL & J. S. ZIMMERMAN,
Abbyville, Kan.

COMPANY.

SASK.

Winnipeg, Man., Calgary, Alta., Saskatoon, Sask.

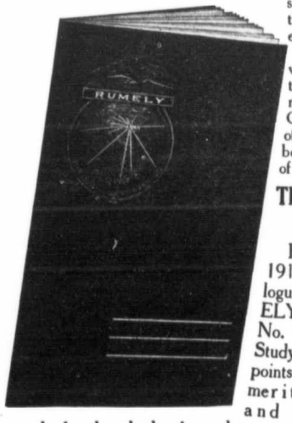
Main Street, LA PORTE, INDIANA

SEND FOR THIS CATALOG IF YOU WANT TO MAKE A BETTER SEASON'S RUN

"I threshed thirty days and in spite of the poor crops I made money. I had no trouble with the engines, no stops for steam or leaky flues."
JAMES McDOUGAL, Nokomis, Sask.

FOR fifty-eight years it has been the policy of the M. RUMELY COMPANY to design and manufacture only such machinery as would bring about a saving of ***time, labor*** and ***money,*** and at all times tend toward bettering the general conditions under which farming is carried on.

There must be a reason why RUMELY goods have always sold so well; why each year the demand is greater than ever before. It pays to have them. They are strong, well made, simple and effective in design, durable and reliable under all conditions. Our customers, the buyers of RUMELY machinery, become our friends and buy of us again.



That is the Secret of Our Success

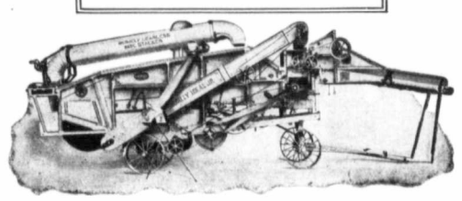
But—send for the 1910 Annual Catalogue, the RUMELY Annual No. 58.—Study the points of merit and note the forethought that is so clearly evidenced in the design of RUMELY machinery. Note the many labor, time and money saving problems that have been solved for the **Thresherman's profit** by **the Rumely principle of design.**

M. RUMELY COMPANY
1951 Main Street
LA PORTE, INDIANA

Gentlemen:—Please send me your Annual Catalog No. 58.

Name .....
Town .....
County ..... State .....
I own ..... Separator
..... years old ..... Engine
..... years old. Am in the market for .....
.....

"I should be pleased to have a new catalogue of your threshing machinery to look over. A Rumely outfit does our threshing, is entirely satisfactory and will get the run again next year."
WALTER R. QUINTON, Heyworth, Ill.



Left Hand View Rumely Ideal Junior Separator

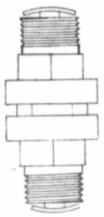
Course in Gas Engineering

This Course will consist of a series of practical talks on the theory and practice of the gas, gasoline and oil engine. They will be simple, illustrated where necessary, and of such a nature that the gas engine owner may easily adapt them to his daily engine work.

LESSON VII.

Ignition Continued.

INDUCTION COIL.—An induction coil consists of a core of pieces of soft iron tightly wound with insulated wire. This winding is called the primary winding. Outside this primary winding, and thoroughly insulated from it, is another winding of wire, called a secondary winding. Remember, the primary and secondary wires

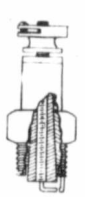


Spark Plug No. 1

are kept completely apart by the insulation. A spring touching the primary winding holds a little platinum "hammer" close to, but not touching, the end of the soft iron core of the soil. This spring and hammer make up what is called the vibrator, trembler or "buzzer." This little attachment to the induction coil plays an important part in its working.

We will now wire up our engine, and then see how the jump-spark system works

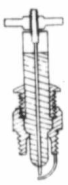
Having connected up all the cells of the battery, join the negative of the first cell to the metal frame of the car, now, from the positive pole of the last cell, stretch a wire to the switch. From the switch bring a wire to connect with the primary winding of the induction coil. What is called a binding post is provided for this purpose. Another wire connects the trembler or vibrator to one of the screw terminals on the commutator. Let us assume for the present that we are dealing with a single cylinder engine. A wire heavily insulated with rubber connects the secondary winding of the induction coil with the spark plug. The spark plug is a piece of wire



Spark Plug No. 2

wrapped around with mica or some such non-conductor. This in turn is surrounded by metal, threaded so as to screw into a hole in the wall of the cylinder.

Assume that the engine is stationary, and that the cam of the commutator is touching the metal part of the rim. Close the switch and a primary current starts from the battery. It rushes through the primary winding of the induction coil, out by the trembler or vibrator, along the connecting wire to the commutator, through the centre of the commutator to the metal of the engine, then to the wire leading to the negative of the battery, and back to the battery. But, as the primary current ran along the primary winding of the induction coil, it turned the soft iron core of the coil into a powerful magnet. This magnet drew the platinum hammer of the trembler or vibrator to it, causing the other part of the trembler or vibrator to become disconnected from the primary winding of the induction coil, thus interrupting the circuit. When the primary circuit was thus broken the magnetism left the core of the induction coil, and



Spark Plug No. 3

cuit. The magnetism left the core, and the secondary current was set going. But when the core ceased to be a magnet, it also let go the hammer of the vibrator or trembler, and so the primary circuit was renewed, and the whole process was gone over again. As a matter of fact, the various events which it has taken so long to describe, follow each other and are repeated so fast that the vibrator or trembler keeps up a buzzing sound (hence its third name "buzzer"). The sparks in the cylinder also follow each other so fast that the spark-

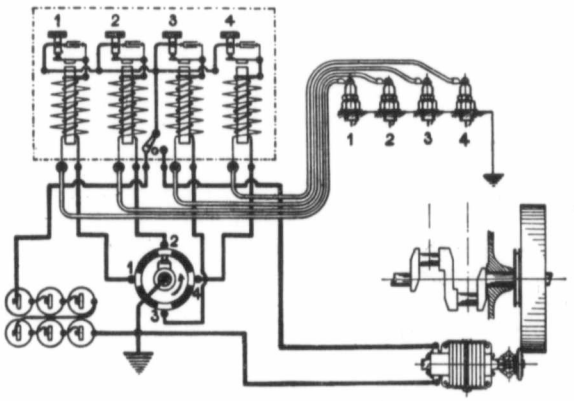


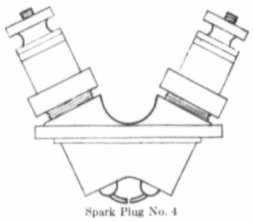
Fig. 6. A method of wiring for a four-cylinder motor

at that instant a powerful secondary current was "induced" in the secondary or outside winding of the induction coil. This secondary current rushed to the spark plug and into the cylinder. Inside the cylinder it jumped the gap between the end of the wire in the spark plug and the nearest piece of metal, causing a spark. Having jumped the gap it kept on its way down the walls of the cylinder and along the metal of the engine frame, until it came to the point at whcih the commutator was attached. It passed through the centre of the commutator to the cam, and then along the primary wire back to the induction coil.

It will be remembered that the primary circuit passing through the primary coil, turned the soft iron core into a powerful magnet. This magnet attracted the hammer of the vibrator or trembler, and this broke the primary circuit. The magnetism left the core, and the secondary current was set going. But when the core ceased to be a magnet, it also let go the hammer of the vibrator or trembler, and so the primary circuit was renewed, and the whole process was gone over again. As a matter of fact, the various events which it has taken so long to describe, follow each other and are repeated so fast that the vibrator or trembler keeps up a buzzing sound (hence its third name "buzzer"). The sparks in the cylinder also follow each other so fast that the sparking seems to be continuous.

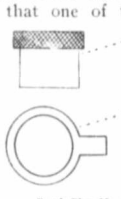
All this goes on as long as the cam of the commutator is touching the metal in the rim. This commutator cam or hand moves with the cam shaft of the engine. When it is not touching the metal of the rim, the whole circuit is broken, and is only renewed when the cam of the commutator and the metal of the rim are again touching. Thus the commutator is adjusted so that the circuit shall remain broken until the beginning of the power stroke, when the spark is needed to fire the charge.

When the engine has more than one cylinder, we still use one battery to get the primary current; but we need an induction coil for each cylinder The wire from the battery, through the switch, to the induction coils, is connected with each of the coils. From each of the coils a heavily insulated wire carried the secondary current each to one of the cylinders. In the same way, each induction coil is connected from its primary winding to one of the metal pieces in the rim of the commutator. Thus, the spark is got in each cylinder in turn, as the cam of the commutator touches the metal in the rim connected with the induction coil which gives the current for the cylinder in which it is desired to fire the charge at the time.



Spark Plug No. 4

Before we can wire up a four-cylinder engine properly, we must find out in what order the cylinders are to fire. Counting from the front of the car, let us number off the cylinders, 1, 2, 3, 4. Now, the crank shaft is so made that the first and fourth cranks are down and up together, while the second and third cranks are together the opposite way. When we get a power stroke in No. 1 cylinder there is an inlet stroke (third in the cycle) in No. 4. Up strokes are being made in Nos. 2 and 3, exhaust in one and compression in the other. It is evident that the power stroke in No. 4 cylinder must come third in the series instead of fourth. Thus, the order of firing in the cylinders must be 1, 2, 4, 3 or 1, 3, 4, 2. To find out which the order is, watch the opening of the exhaust valves. Put a piece of paper between the end of the valve lifter or rod which the cam punches up to lift the valve, and the stem of the valve. Do this with the exhaust valve of each cylinder. Now, turn the engine over slowly. That is to say, turn the crank in front of the engine that is keyed to the crank shaft. When you have made a half turn of the crank, you will notice that one of the bits of



Spark Plug No. 5

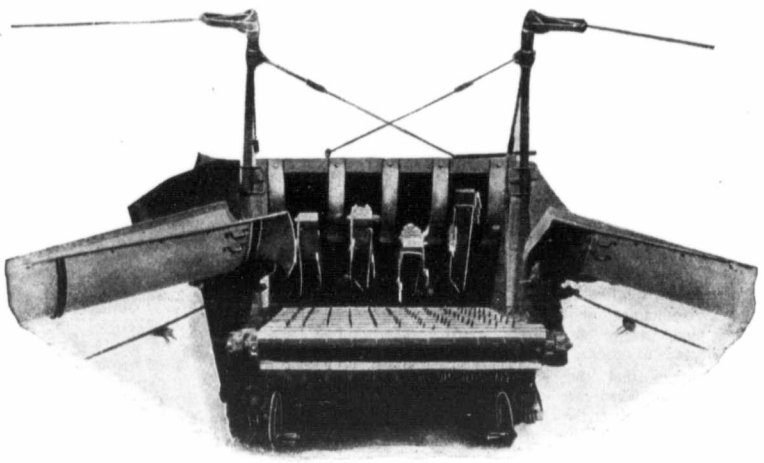
paper has been gripped firmly between the valve lifter and valve stem. This means that the exhaust valve is being opened. As you go on turning, you will notice that the paper at each

Continued on page 37

THRESHERMEN

You are in the business in 1910 to make money, more money than you made in 1909

To do this you should have a **White Wings Feeder**. The **White Wings** is not a new thing or a make-shift, but has been thoroughly tried out and has proven itself to be everything that is claimed for it. Never since we have been in the feeder business (and we are the pioneers) have we placed on the market a machine that so fully filled the long felt want or one that has given such universal and enthusiastic satisfaction. **It will save the wages of three or four pitchers and their board; thus saving from $12.00 to $15.00 every day that you run your outfit.** They are easily handled, are adapted to any kind of threshing, either from the stook or from the stack. The wings are so constructed that they will reach out 12 feet 6 inches in any direction with their two long arms, hauling the bundles in hand over hand, so to speak, from the top of the stack to the bottom, from the ground in front, or to the side, pouring two steady streams of grain into the feeder and feeding the separator to its full capacity, the even, steady flow permitting the separator to do a perfect job of threshing.

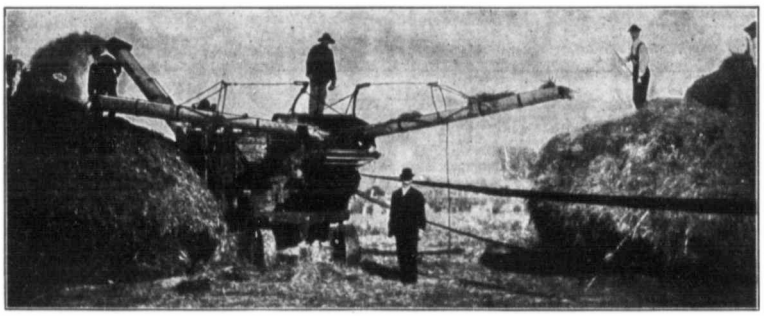


The pitchers are out of the dust and their work is pleasant. Four pitchers can do the work that would take from six to eight to do with the short rigid carrier machine.

With the **White Wings Feeder** there is scarcely ever any litter left about the machine when the grain is threshed, so that a great amount of time is saved in cleaning up.

You will never know what real quick, economical threshing means until you have used a White Wings Feeder.

The **White Wings is a job taker and a money maker,** always leaving a satisfied farmer and a job threshed at a profit to the thresherman. **It is constructed of the best of material; it will increase the life of your separator by one-third and is moreover backed by our general warranty that goes with every feeder we sell.** Remember, there are years of reputation for feeder building back of the White Wings. You take no chances, we run all the risks—because there are none.



Remember the White Wings is no imitation, but is the original wing feeder, the success of which has led others to follow in our steps.

Read what this thresherman says who gave our White Wings a thorough trial.

Twin Falls, Idaho, Nov. 26, 1909.

Parsons Hawkeye Manufacturing Company, Newton, Iowa.

Gentlemen:—I am sending you under separate cover a set of photos of my Russell outfit for 32-inch White Wings Feeder. I have operated all makes of Feeders on the Pacific Coast; I have sold threshing goods from Mexico to British Columbia; experted in the field and owned different rigs of my own and I can truthfully say that the White Wings Feeder is the greatest improvement that has come forth in the threshing center for years.

A threshing rig without a White Wings Feeder is a "back number." Now, brother thresherman, look at the photo of my rig and compare this with your outfit. Can't you see where I am ahead of you? Take your pencil and paper and figure a little.

Take my run for an example; forty days with a cook wagon outfit. We will take the old feeder in 1908. I have ten pitchers at $2.50 per day or $25.00 per day; average day's work 2,700 bushels.

With the White Wings Feeder in 1909 I had six pitchers at $2.50 per day or $15.00 a saving of $10.00 in labor, average day's work 3,100 bushels in 1909, a gain of 400 bushels per day and as we get 4c for oats and 6c for wheat, an average of about 5c on 400 bushels, or $20.00 per day gain, a total gain of $30.00 per day, saying nothing of the four extra men board saved. This gain over other makes of Feeders for forty days is $1,200.00 enough to make a payment on our outfit saved by the feeder alone.

Now, I will show you where this is done. On stack grain, three men on a stack, each man puts his bundles in the feeder; therefore, you are bound to get an even steady feed. This avoids all choking up of your riddles; you know what your machine is doing at all times. In cleaning up, there is no shatterings, the time in cleaning up is cut down to one-third. Six men can put through more grain with the "White Wings" Feeder than ten men can with the old style Feeder for money, chalk or marbles.

If any person wants the names of farmers I threshed or to find out the general opinion of this wonder they can get them from me.

Buy a "White Wings." Your head is wrong if you don't.

Yours truly,

R. W. Steele, Twin Falls, Idaho.

We also handle the Ruth Feeder, the Hawkeye Feeder and the Parsons Feeder. We handle and carry in stock a full and complete line of threshers' supplies. We handle the famous Past-time Washing Machine, the Hawkeye Detachable Wagon Box Manure Spreader, and Maytag Automobile.

Address the

Parsons Hawkeye Mfg. Co.

WINNIPEG, CANADA

GASOLINE TRACTION ENGINES
A DEPARTMENT FOR THE USER

WE want every owner of a gas tractor in Western Canada to give us his experience. The owners of gas tractors to-day are in a sense pioneers. They are working out the data and compiling a record of work done that both manufacturer and farmer alike the world over are watching with intense interest. Don't keep what you know under your hat, but let us have a story of your gas tractor work. We will reward every such story with a copy of "Plain Gas Engine Sense," one of the best handbooks we know of on the gasoline engine. Don't neglect this matter but let us have your experience at once.—(Editor.)

Would Like a Small Gas Tractor.

I note with pleasure that the number of different makes of gasoline traction engines on the market is increasing each year. Those farming on a large scale have now got so many different types of gasoline tractors to select from that they can pick out an engine that will suit them almost as well as if they had had it made to order.

Granted then that the large farmers are well taken care of, I think it is time that the good manufacturers were giving a little attention to us small farmers. If it pays for the man who is using three four horse teams to substitute a traction engine for his horses, then I believe it would pay for the man who is using only one four-horse team nearly as well. It is true of course that the big farmer can dispense with two or three of his teamsters while the farmer who drives his own team in the field would still need to put in his time on the engine, but the cost of labor is not the only item involved. Horse feed would be reduced in the same proportion in both cases and the working hours could be lengthened as well with a small as with a larger engine.

Consequently, I think a gasoline tractor of say 8 nominal horse power that would be able to draw any ordinary farm implement, which is now hauled by four horses, and draw it at the same rate of speed, which could also get up to fences and into corners and turn on the same space as a four-horse team, would meet with a ready sale. An engine of this size could be put out at a price of from $850.00 to $950.00 f. o. b. at factory.

It isn't only the high price of the big engines that scares the small farmer, but as he has only one implement of each kind, if he bought an engine of from 12 to 15 horse power and up in order to make it pay he would have to buy one or two more plows and seeders and drags and harvesters, etc.

It is true that there are now two or three makes of gasoline tractors on the market rated at 8 horse many different types of small power, but I think if there were as engines as there are of the larger sizes and they were as well advertised, the demand for them would surprise the manufacturers.

Yours truly,
A Small Farmer,
Bowell, Alta.

Thinks Gas Ahead of Steam

I have had quite a lot of experience with gasoline engines, having run one for six falls threshing. It was a portable engine, and last fall I bought a 20 horse power International traction gasoline engine.

An International Gas Tractor in the Cotton Fields of the South

I have not done any plowing with my engine yet, but I ran one last summer, and I think a gasoline engine is cheaper than horse flesh. I had a 20 horse power engine and pulled six plows when plowing in stubble, plowing 18 acres per day and using 27 gallons of gasoline a day and two barrels of water. The gasoline cost 21c. a gallon, and I was getting $30.00 a month. When breaking I had four plows and broke 13 acres a day and used 26 gallons of gasoline a day and two barrels of water.

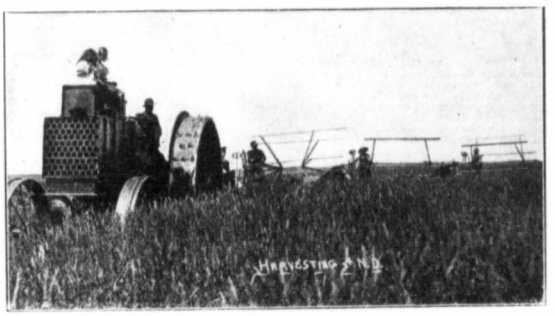
In regards to threshing, I am sure that the gasoline tractor is getting far ahead of steam. I do not have to get up at four o'clock to get up steam. Two of us can belt and oil up and start in five minutes. Then there is another good point. When travelling on the road we are not stopping half the time for water or straw or steam. My separator is only a small one, so it is not worth while to say anything about it in this letter.

Trusting this will be of some good to someone, I remain,

Yours truly,
Thomas W. Pott,
Stuartburn, Man.

Breaks Sod for $1.75 per Acre.

We have a 45 brake h. p. Hart-Parr gasoline traction engine and have used it for breaking sod, plowing stubble, discing, harrowing and threshing.



A Gas Traction Operating Binders by means of a Hansmann Binder Hitch

When breaking sod we use a 6-bottom sixteen-inch Emerson engine gang and break two acres per hour, using six gallons of gasoline, or five gallons of kerosene per hour. Gasoline costs us 25c. per gallon and kerosene 22c. per gallon.

Breaking sod can be done at a cost of $1.75 per acre for fuel and wages to men including blacksmithing and oil. Plowing stubble can be done at a little less expense than breaking sod; double discing and harrowing at less expense than with horses and done much better than with horses.

We broke 957½ acres of sod in 47 days, having pulled packer on 536 acres of the breaking, plowing 409 acres of stubble in 17 days, 541 acres of double discing and harrowing in 8 days and 77,241 bushels of grain threshed in 25¼ days.

We consider the gasoline traction engine to be more economical than steam. A good gasoline engine gives steadier power and is easier handled than a steam engine.

We will use our engine to grind feed in the winter and also to move buildings.

Yours truly,
Bowser & Patterson,
Nanton, Alta.

Has an Ivel Motor.

I beg to say that I own and operate two gasoline engines, one a 20 h. p. International Harvester engine and one 18 h. p. Ivel agricultural motor. The International Harvester engine I have only used this fall threshing and have not yet much data to refer to, but will write you more fully when I have finished threshing.

The Ivel motor, of English make, I have used breaking, crushing and discing. It is a splendid machine for the individual farmer. In a day of ten hours I can break with three twelve-inch furrows, eight acres of passable prairie sod, using 17½ gallons of gasoline. But I think my engine is better suited for discing, rolling and harrowing to which purpose I intend to put it next season. Gasoline costs, laid down at Elstow 29c. per gallon in barrel lots.

Enclosed please find P. O. for my subscription to The Canadian Thresherman and Farmer for one year.

I beg to remain,

Yours sincerely,
L. Daless, Elstow, Sask.

Will try Kerosene.

I own a Hart-Parr gasoline plowing and threshing traction engine, 45 brake horse power and 22 tractive horse power. We pulled with this engine four fourteen-inch plows in gumbo breaking. We made the gumbo pay a little profit @ $4.50 per acre.

Continued on page 38

THE GAS TRACTION ENGINE
KING OF ALL GENERAL-PURPOSE FARM TRACTORS

Find Out All About The Gas Traction Engine

We can't tell you all about our Engine in an advertisement. We would like best for you to see it yourself. If you are in Winnipeg at any time come to our factory at Elmwood and examine it. Right at once you had better send for our free book "The Passing of The Horse." It tells a lot about our Engine and contains some mighty interesting reading. Send for it today.

Consider These Statements Carefully

We say the Gas Traction Engine will stubble plow 25 acres per day. Several farmers have broken over 40 acres of virgin prairie sod in one day.

We say our Engine can pull 6 to 8 breaking plows and from 8 to 10 stubble plows. It has pulled 12 stubble plows.

We allow 1¾ to 2¼ gallons of gasoline per acre breaking but we have affidavits saying it has been done on one gallon per acre.

Affidavits from farmers using the Gas Traction Engine show the cost of plowing per acre to be under 30 cents and as low as 24 cents.

These are only a few of the interesting proven facts we can give you regarding our Engine.

Free!

Send For

This Book

The Gas Traction Engine Produces Results

It will give big results to you. Helping you to do good farming quickly and cheaply—that's the one aim of **THE GAS TRACTION ENGINE**. Its thorough construction assures unlimited endurance. Its perfect and practical design lets it do work done by no other farm tractor. It weighs only 14,000 pounds—never injuriously packs the soil. It has power, endurance, and is built for economical operation.

THE GAS TRACTION BINDER HITCH

Permits use of Binders in multiple with Traction Engines. A wonderful invention. Every power outfit should have one. Write for particulars.

The Gas Traction Company

Grain Exchange Building
WINNIPEG

Note. We Manufacture at Elmwood, Winnipeg

Gas Engine Experience Departmemt

UNDER this heading we shall publish regularly the experiences of our readers with gas engines, stationary, portable or traction, as a matter of mutual help. We want you to give us your expepience. Tell us your troubles, no matter how small, and we shall be pleased to set you right. We have made arrangements whereby your questions will be referred to a staff of experts, and the answers to your questions can thus be relied upon. What we want principally is your experience with a gasoline engine. It is only in this way that we can build up this department making it mutually valuable to yourself, your neighbor, and to this magazine.

Will Solve Problem of Hired Help.

Heavy crops in this vicinity and scarcity of men and teams made threshing in our vicinity a very slow business this fall. Weary with waiting, my brother and I decided that we would purchase a small outfit and try and put ourselves and our neighbors out of torture. Our choice fell upon gasoline and eventually we decided to purchase a 16 h. p. Stickney engine and a Waterloo 28-42 separator with straw carrier. We selected a straw carrier, for we knew we would not have much power to spare.

So far, so good. Even though it was getting so late, there was heaps of threshing to do and our outfit was to be on the scene within 48 hours. But we reckoned without sufficient knowledge of railway methods and it took the C. N. R. nine long days to carry that separator outfit 500 miles. However, all things come to an end and we were in possession of our machine with only a small knowledge of a gasoline engine and odd work around a separator to help us. All the steam engine owners who knew of our purchase of course were full of advice and even said that supposing we got the engine to start, it would not even run the separator idle.

However, we started and have run 20 full days without a breakdown or a stop on the part of the engine, while the separator has done splendid work.

Working as we were at the end of the season (October ninth) one full day's work would only pan out at best at about ten hours work and of course they kept getting shorter. The straw, too, owing to rains and frost had been tough and yet our average with four stook teams and two pitchers was over 750 bushels and our best day in wheat was 960 bushels.

Our fuel consumption would run about 17 gallons, but this high average was caused by the large amount of tough straw we threshed. Our engine is a wonder for power and simplicity and it is to be hoped that the company will see their way clear to place a 20 or 25 horse power engine on the market, as with an engine of this size and a blower on the same separator, there should be no trouble in averaging over 1,000 bushels, daily.

Gasoline engines in careful hands should go far to solve the yearly increasing problem of threshing and hired help.

Yours truly,
Vivian F. Bateman,
Saskatoon, Sask.

Likes our Magazine.

In reading your valuable paper I noticed several good helps on handling engines; so decided to send you a few lines on our small experience.

We bought an International Harvester 20 h. p. portable gas engine in July, 1908, also a Nichols and Shepard separator 28 x 40, with all attachments. We brought our new outfit home, and tried the engine on a ten inch grain grinder until we got used to handling it. When the threshing season commenced we were ready with a six-stook team and men, and myself to attend to both ends of the outfit.

The first day we threshed 1050 bushels of wheat in 9 hours, and our success was more than satisfactory, considering our inexperience. We did not start out with the intention of threshing very long, but just to do our own work and that of a neighbor or two. But our work was so satisfactory that we decided to try to do more another year.

In winter we used our engine for grinding grain for ourselves and neighbors and made over $125.00 above all expenses.

Our success the next fall with threshing was all that could be desired. I started out with a 6-stook team and men, and just one man to look after engine and separator. In 36 days' time I had threshed 34,000 bushels of wheat and 9,000 bushels of oats. Then after that we threshed 1,800 bushels of flax before the weather got too cold. I got 7c. a bushel for wheat and 5c. for oats. After paying all running expenses, hired help and $1000.00 on machines, I had $1250.00 to the good; so will say if the gas engine is properly handled it will do the work and is far less trouble to look after than steam. I can easily thresh 100 bushels of wheat per hour with a crew of seven men.

Yours truly,
T. H. Conboy,
Asquith, Sask.

Will Stick to Gas Power.

Some years ago I bought a 10 h. p. McLachlan gas engine to install in my feed mill. As I had read a gas power magazine for some time I believed that I understood all about the gas engine, but I soon found that I needed experience.

The engine had a throttle governor and an electric igniting device and was equipped with a five cell dry battery. The engine started quite easily, but after a while it began to miss fire and I could not find the trouble. When I tried the batteries I found that they gave a good spark, but after some time I found that the trouble was in the batteries as it had to ignite every working stroke. It used the batteries very hard. So I bought a Henrick's magneto, which I have used for three years and is still as good as new. I start the engine

now by holding the exhaust valve open. Then I give the fly wheel a few turns, so as to get momentum enough to turn over compression. Then I let the exhaust valve close, turn over compression and the engine starts, without the use of batteries.

I have remoddled the governor to a hit-or-miss now, and find it far better, especially for light work, as it does not use so much gasoline.

I had some trouble with preignition. It began to knock very hard in the cylinder after ten minutes run, when the cylinder became warmed up and after looking for the trouble, gave up. So I wrote to the Gas Power, asked what the trouble was and how it could be remedied and they told me that the inside walls of the cylinder must be covered with carbon and this becoming red hot, caused the preignition. I therefore, cleaned the cylinder and the trouble was gone, but I stopped using common machine oil to oil the bearings. The engine is lubricated by the plash system and the machine oil flowed from the bearings into the crank pit, and was worked by the crank into the cylinder.

I run with the engine a 10 inch plate crusher and can grind an average of about 15 bags per hour. I also run a 42 inch Burr stone mill, but the capacity with this is much less as the mill is too big for the engine.

I also use the engine for running the wood saw and grind stone and find it very handy. It consumes nearly one gallon of gasoline when under full load. The price of gasoline is 25c. per gallon. I have tried to use kerosene instead of gasoline. The engine got the same power, but it knocked so hard that I believed it would go to pieces.

I have used a 7 h. p. New Way air cooled gasoline engine for cutting straw and found it very good, as it was very light for its power and there was no water to carry around with it. I have cut as many as 480 bundles per hour and stopped very often to sharpen the knives.

I intend to buy a larger traction engine for threshing, as my steam engine is too small, for I have to put a straw blower on my separator. If I were sure that the price of gasoline would not go up much higher, I would not hesitate to buy a gasoline traction engine as I know I can depend on a gasoline engine as well as on a steam engine, and I find it more durable because there is no boiler to rust. I would like to hear from threshers who have used the newer gasoline engines.

Yours truly,
Jacob P. Elias,
Hochfeld, Man.

Gas the Coming Power.

I beg to say that I own an International Harvester Co. 20 h. p. gas engine. I have had it for two years and so far have had very little trouble with it.

The first year I was bothered with the battery connections. The wires formed a short circuit and played the batteries out. This year the engine ran all right for about a week when one day the men worked up to five o'clock and then shifted to another setting and could not get the engine started. I was away from home and got back just as they tried to start the engine. I took it in hand and found it had lost its compression on turning the fly wheel so as to show the piston. I saw that it was quite bright with no oil on it and on enquiry I found that the man who looked after the engine had run out of cylinder oil about 3 o'clock and not wanting to lose time sending to the house for more, he had poured in engine oil instead. The engine worked alright up to the time they stopped; during the time of shifting, (about a quarter of an hour) the heat from the cylinder had dried up the oil, causing it to lose its compression. We filled the lubricator with fresh oil and allowed it to run a short time full, also gave the piston a lot of oil and then it started alright.

The second trouble that we had was the piston would lubricate top and bottom, but not at the side, causing gas to escape. I took out the piston, rubbed it and cylinder with coal oil and then a coating of cylinder oil and it worked alright. I think the trouble was caused by the cylinder gumming up.

The third and last trouble was when the cold weather came. The engine would start up alright, give 4 to 6 explosions and then die down, both on the battery and auto spark. It would do this several times, but after we got it well started there was no more trouble. I do not know the cause of this unless it was the cold weather.

I should have mentioned that mine is a portable engine and I have just used it for threshing purposes. I certainly believe the gasoline engine is the coming power for the farm and is far more handy than steam in every way.

Yours truly,
R. Hind,
Cottonwood, Sask.

A New Six Stroke Cycle for Internal Combustion Engine

Proposed by M. L. King, before the 3rd Annual Convention of the American Society of Agricultural Engineers

THERE is so little definitely known concerning what actually happens within the gas engine cylinder that it is impossible to state just what temperatures, pressures, and transfers of heat actually occur, therefore, we are often forced to the use of generalities of limiting statements. In the discussion of probable results and conditions of the operation of mechanisms embodying new ideas even wider generalities and limits must be used. However, in order to profit in the development of an idea by the knowledge and opinions of other men, the idea must be presented in as definite a form as possible and the desired discussion thus induced. In hope of bringing out discussions which will aid in avoiding expensive mistakes, I wish to present a description of an internal combustion engine cycle which, so far as we know at present, is new and untried. The conception of this cycle has occurred within this experiment station, therefore we desire that it shall be known as the Iowa cycle.

EVENTS OF THE CYCLE.

The first three strokes are similar to the first three of the Beau De Rochas or Otto four stroke cycle. In the fourth, or exhaust stroke, the exhaust valve closes in time to permit the admission of a small quantity of mixed water and steam coming directly from an exhaust heater. This fluid absorbs heat from the cylinder walls, piston head, and piston rod, in case of a double acting engine, expands doing work in the fifth stroke and is exhausted, thus scavenging the cylinder during the sixth stroke, which is the last event of the cycle.

SIZES OF ENGINES TO WHICH THIS CYCLE MAY BE APPLICABLE.

This cycle probably is not applicable to any engine except those which, for some other reasons, may require constant skilled attention. Obviously, an engine embodying this cycle will be somewhat more complicated than the ordinary four-cycle engine. This complication is, of course, under any and all circumstances, objectionable unless it brings about sufficient increases in efficiency or other desirable features of the engine's performances. It will be seen at once that in general this limits the use of the new cycle to larger engines. However as the time passes the desirability of high economy is undoubtedly increased. Also the order of intelligence of the average engine attendants will increase so that in the future the advantage of economy is sure to increase and the disadvantage of complications will decrease.

THERMODYNOMICAL CONDITIONS AND ADVANTAGES.

A quantity of water is pumped into a heater where it will be caused to absorb as much as possible of the heat contained in the exhaust gases and steam. Previously it could be passed through a water jacket which surrounds only surfaces which need to be lubricated in case the spray does not sufficiently cool the surface to be lubricated. In order to prevent ignition troubles, the quantity of water must, of course, be so slight that no wet steam will remain in the cylinder at the time of ignition.

In order to reduce, so far as possible, thermal losses from the products of combustion, the cylinder must be thoroughly lagged and run as hot as possible. This, of course, means that only enough water be used to permit lubrication and prevent pre-ignition. The quantity of water necessary for the former will probably be less than for the latter which will permit the operation of the cycle under its most favorable condition. That is the use of all the heat of combustion, except unpreventable radiation, by the least possible quantity of working material which causes the maximum range of temperature and consequently the maximum efficiency. The heater should probably be made up of an outer shell concail in form and a compact coil of pipe through which the water advances steadily toward the apex of the cone which is the portion of the heater at which the hot gases enter. In other words, the water and exhaust products pass through the heater in opposite directions which is, in any case, best from a thermodynomical standpoint and, in this case, is perfectly practicable from all other standpoints. No undue stresses would be induced, as the change in temperature would be uniform from end to end of the heater.

This heater probably could not be made so large as to be objectionable and thermodynomically, because any enlargement of the cone would merely be an addition to the large portion of it in which the temperature is a minimum, and from the surface of which the radiation would consequently be a minimum, while any such addition would still further reduce the temperature of the exhaust products leaving the heater.

INSULATIONS OF CYLINDERS.

The engine cylinder should be thoroughly lagged over. If a non-conducting substance could be found for lining the cylinder which would withstand conditions present, it would be advantageous. This is especially true of the piston head. In fact, it will undoubtedly be advisable to prevent all possible loss through the piston head in order to decrease lubricating difficulties. It will still be advisable, as in other gasoline engine designs to hold the ratio of surface walls to volume of contents as low as possible. Projections within the cylinder need

not be so carefully avoided as in other engines, but pockets, etc., will need to be even more carefully avoided as they will be harder to cool but, of course, would not be likely to cause auto-ignition as readily as would a projecting portion having the same temperature on account of the fact that no reasonable amount of scavenging can accomplish its purpose perfectly in pockets. Therefore, inert gases are still liable to lurk within pockets of such depth that cooling would be inefficient but the explosive mixtures would be particularly excluded from such pockets, thus reducing the danger of pre-ignition.

CHANGE IN MECHANISM NECESSARY.

A three to one gear and cam which opens exhaust valve twice during cycle; steam inlet valve and operating mechanism; two safety valves, one set in by-pass back to pump, and one place at valve and pipe taking exhaust top of heater; auxiliary exhaust steam to lower point in heater.

GOVERNOR.

Same as in any other engine, governing both fuel and water. To this might be added a throttling thermostatic governor to prevent the use of water in a cold engine and to regulate cylinder temperatures at all times.

PUMPS AND VALVES.

This pump will need to pump only a very small quantity of water but it should be capable of pumping water against a pressure of at least 1,000 lbs. per square inch. This water will be cold. It would probably be advantageous to provide a by-pass around the last check valve through which the water passes. Within this by-pass should be a safety valve, adjusted to the required pressure within the heater. Another safety valve should be provided opening from the upper end of the water tube to prevent undue pressure due to absorption of heat by the water while the pump may for any reason be standing still.

The nearest approach to this which the author can find an account of is a two-fluid engine described by W. Robertson, as follows: "In 1892 Bertram Chatterton designed, for engines above 30 horse-power, a combination of a gas engine and steam engine, having a gas stroke and steam stroke alternately in the same cylinder without jacket.—The explosive mixture is compressed in an air pump and discharged into a high-pressure reservoir to supply the cylinder every alternate stroke with compressed gas, which is admitted for part of the stroke and then cut off and exploded electrically.

"Chatterton tried various forms of ignition apparatus, and finally found that the most reliable was by a continued succession of electric sparks in a little box covered with a valve which was opened quickly —the expansion of gas was to about two and a half times the original volume of the mixture before compressed to about 20 lbs. per square inch and the boiler pressure was 90 lbs. per square inch. One of the greatest defects was the shock produced by the extremely violent explosion. This was doubtless due to the presence of steam in the cylinder; which made the time of ignition of the gases unreliable and beyond control. After working at this engine for nearly three years, Chatterton abandoned it."

Even before finding this interesting account of Mr. Chatterton's work, it was seen that it would be necessary to use such a small quantity of water that no such trouble as he experienced with ignition would need to occur. Therefore, his work shows nothing of impracticability in the Iowa cycle.

WAYS IN WHICH PRACTICAL RESULTS DISAGREE FROM THEORETICAL POSSIBILITIES.

1. Loss of heat from fluid after explosion to cylinder walls.
2. Slow burning.
3. Specific heat of working fluid increased with pressure while theoretical fluids upon which efficiency calculations are based is constant.
4. Changes of volume of fluid due to chemical changes.
5. Friction and leakage of working fluid during events of cycle.
6. Loss of heat to cylinder walls during compression.

MAGNITUDE OF THE LOSSES.

According to Reeves, 30 to 50 per cent. of the total heat of the fuel is lost through cylinder walls. Many other authorities are of a similar opinion. However, the British Institution of Civil Engineers' committee on internal combustion engines tested three engines of different sizes, 5½ x 10, 9 x 17, and 14 x 22, on which the jacket waste was found to be 23.5, 29.3 and 25 per cent. respectively. The first is known to be incorrect, as the sum of all heat accounted for amounted to only 93.1 per cent. Prof Clerk states that only a portion of this loss (25 per cent. for the last engine) actually occurred during the working stroke as considerable occurs during exhaust stroke, also the jacket surrounds portions of the exhaust pipe, valve and valve stem, thus absorbing heat after gases have passed through. However, it is a well known fact that even before the exhaust valve opens, the cylinder walls begin to give back heat to the gas charge. Upon the opening of the exhaust valve, the temperature of gases would fall to such an extent that the transfer of heat for at least a considerable portion of the exhaust stroke would be from the walls to the gases. Prof. Clerk, by means of other experiments upon the same engine, arrives at the conclusion that during the working stroke it actually gave up only 16.1 per cent. total heat of fuel to jacket water; 49.3 per cent. remained in gases; and 34.6 per cent. appeared as indicated work. A similar test on a smaller engine of a different make showed indicated work, 22 per cent.; heat lost to jacket water, 34.3 per cent.; and heat remaining in exhaust gases, 43.7 per cent.

But since it is true that the inner skin of the cylinder walls reach a temperature at which they actually give back heat to the working fluid before exhaust, this transfer

of heat from the walls to the gases will be greater at least the early part of the exhaust stroke on account of the fall in their temperature when exhaust valve opens. From these considerations, it seems reasonable to assume that the average loss during the working stroke is 25 per cent. or more. This loss, if eliminated, would be in the heat balance be about evenly divided between the items indicated work and exhaust loss, which alone would increase the efficiency of the average engine by 12½ per cent of the total energy of the fuel and leave the exhaust loss near 50 per cent. or possibly as high as 60 per cent. on account of variation of specific heat gas. Of this, the heater will store in the water at least 80 per cent., or 40 per cent. of the total energy. This mixture of water and steam will be used in a hot cylinder, out of which has just passed gases often having a temperature of 1800 deg. F., and the quantity of water required in each cycle is so small that expansion may be carried as far as practical for a non-condensing engine. Therefore, it seems conservative to estimate that this engine in using steam will have a cylinder efficiency of 20 per cent. This will add 8 per cent. of the total energy to the useful side of the heat balance. As this exhaust steam passes through the heater, it may be made to give up all its sensible heat above the temperature of condensation and undoubtedly 15 per cent. or more of its latent heat may be recovered by means of the heater. The amount which may be recovered can only be determined by trial but it is common in the use of enclosed feed water heaters to condense 15 per cent. of the exhaust steam, and since the forced downward passage of the exhaust products is conducive to unusually complete heat transfers we may safely expect to get back from the exhaust steam considerably more than 15 per cent. of its latent heat. This, in turn, will add still more to the efficiency of the unit. Thus, we may reasonably expect the use of this method of cooling and scavenging large engines to add at least 20 per cent. of the total energy of fuel to the useful side of the heat balance sheet.

The addition of an ordinary air scavenging revolution does not reduce the power of an engine and the engine friction is practically independent of load, therefore, the consideration of mechanical efficiency does not enter into the discussion except the added friction of the steam inlet valve, which is quite slight, and would be far more than balanced by the added power of the engine due to steam stroke.

In further consideration of the efficiency of this type of engine, a designer should try to establish conditions which will give the greatest efficiency to the first four events of the cycle as will be consistent with the service required of the engine. Then use the last two events of the cycle in such a way as not to cool the cylinder more than necessary and to give the greatest quantity of exhaust products possible, as the ratio of the available heat to the quantity carried off by exhaust products will determine the thermal efficiency of the unit. It will readily be seen that the quantity of heat depends upon the quantity of exhaust materials and their temperature as they leave the exhaust heater.

ADVANTAGES OF THIS CYCLE IN COOLING OPERATION OF THE ENGINE.

The two principal objects in cooling the walls of a cylinder are to prevent auto-ignition of charges taken into the cylinder and to hold the temperature of portions of the cylinder walls low enough to permit the necessary lubrication.

For the former, it is only necessary to abstract the heat before compression occurs, but it is highly advisable to have as little transfer of heat as possible from the cylinder walls to the enclosed charge during the suction stroke; therefore, cooling immediately after the exhaust of gases will be found beneficial. The average temperature of the walls of the combustion chambers may remain much higher than if cooled externally, because the spraying inside will cool projecting points more thoroughly than any other portions of the walls while with external cooling the reverse is true. These points are usually the cause of pre-ignition. Thus, this system of cooling will prevent preignition when the average temperature of the combustion chamber walls is very high, by simply cooling the inner portion of them.

For the latter, it is highly essential to abstract the heat from the walls as quickly as possible. In the old method this heat was forced to travel through the cylinder walls to the cooling water without, while in the method of cooling by spray, the heat will be absorbed from the inner surface immediately after the exhaust valve closes, the cooling vapor will be in contact with different portions of the lubricated surfaces exactly the same length of time as the hot gases. Thus the amount of cooling furnished to each part of the wall will be in proportion to that required. Also the temperature of walls will not be limited by boiling point of jacket water. So the method of cooling by spray will be applicable to an engine using any kind of fuel and the quality or thoroughness of cooling may be adjusted instantly. Also, if occasion demand, a portion of the cylinder where lubrication is necessary, could be water-jacketed. The need of this, however, seems improbable as the insulation of the piston head will reduce cooling difficulties ordinarily found in these engines. In large engines little or no sticking of the piston occurs with light loads but as the load increases the temperature and consequently size of the piston increases while the temperature of the jacket water must be reduced, which probably reduces the mean temperature of the cylinder walls, thus causing them to actually contract which causes the piston to bend. With the insulated piston head and a system of cooling which varies directly with the load, this difficulty will certainly be greatly reduced.

Passage of heat through metal obeys practically the well-known

laws governing passage of electricity through a conductor—that is, resistant to the flow of heat varies as length of conductor and inversely as area. Then the amount of heat passing through a certain area of cylinder wall depends upon difference in temperature of two surfaces, conductivity of metal, and its thickness. For this reason, in small engines with thin walls, hot jacket water may be used, while in larger engines with thicker walls, cooling difficulties increase and the temperature of the jacket water must be reduced. Thus, the mechanical performance of larger engines will be particularly improved by the fluid scavenging.

UNIFORMITY OF MIXTURE.

By the occurrence of a scavenging stroke between the working strokes, a more uniform mixture is sure to be had and the dilution of the explosive mixture by gases remaining in the cylinder will be entirely eliminated. This will undoubtedly be accomplished more completely than in the case of the air-scavenged engine which is an established success.

The cooling of the cylinder and working parts from within will be found especially advantageous where it is desired to build a double-acting gas engine because the piston rod, piston and packing glands may be cooled far more readily and efficiently than is possible with the external method of cooling. The danger of loss of compression will also be reduced as the sequence of events cause the working stroke of steam and compression of the charge to occur on opposite sides of the piston at the same time.

GOVERNING BY VARIABLE CUT-OFF.

In the case of an engine governed by variable cut-off of the suction stroke, the governor may be caused to vary the cut-off of not only the suction stroke but steam valve, also causing the smaller throttle to be compressed in a hotter cylinder than a large charge which will increase the compressure, pressure and temperature of that charge and in this way decreasing the greatest disadvantage of this method of governing of vice versa for over load.

FLUCTUATION.

Another advantage of the new cycle, which in some cases may be of importance, is the possibility of forcing heat other than that derived from the engine, through the heater, thus generating large quantities of steam and increasing the power of the unit. This heat, in some cases, might be derived from other boilers but usually would be supplied by fuel similar to that used in the engine itself. Auxiliary burners might be supplied for this purpose. Also, in the case of momentary over load, the governor might be so arranged that it would give greater steam valve opening, thus drawing from the supply of heat stored within the water of the heater.

In the analysis of this problem, it has been deemed advisable to enter into a detailed discussion of the mechanism used to carry out this idea, but the author will be glad to explain anything of this kind so far as we have it designed.

Once more I wish to mention the fact that this paper has been presented principally for the purpose of bringing forth a rigid discussion of the possibilities of this cycle and the difficulties of utilizing it in practice.

If, after this meeting, any further discussion of the question occurs to the mind of anyone, the Station will be more than pleased to know of it.

Course in Gas Engineering

Continued from page 28

cylinder gets held in turn. Note the order in which the exhaust valves are worked in each cylinder, and you have the order in which the cylinders fire.

Figure 6 is a diagram of the wiring of a four-cylinder engine jump-spark method. A dry-cell battery and a low-tension magneto are used to get the primary current, the battery being used at starting and the magneto afterwards. It shows the switch on the induction coil box set to take the primary current from the battery. Observe that positions 3 and 4 on the commutator are reversed in order. This means that we get the spark in No. 4 cylinder before we get it in No. 3, the order of firing being, 1, 2, 4, 3.

WHEN THE SPARK SHOULD BEGIN—It is evident that the best work can be got out of an engine if the charge is fired immediately at the beginning of the power stroke. To effect this, it is necessary that the sparking should begin slightly before the piston has been pushed up the whole way on the compression stroke. The reason of this is that the charge does not take fire and explode the moment the spark is made. A small fraction of a second passes between the first appearance of the spark and the explosion.

ADVANCING AND RETARDING THE SPARK.—It is sometimes desirable to fire the charge well after the piston has begun to go down for the power stroke. The commutator is so arranged that it can be moved or "rocked" to and fro on its centre by some mechanical means, where the operator can get at it easily. If the commutator is turned from its usual position in the same way as that in which the cam shaft is turning, the commutator cam will touch the metal in the rim of the commutator later than it otherwise would, and the spark is "retarded." To "advance" the spark, the opposite course is followed. The faster the engine is going, the further the spark may be advanced. A good time to retard the spark is when cranking up the engine at starting. There will then be no danger of a "back kick," which might break the cranker's arm or otherwise hurt him.

TIMING THE ENGINE—It is sometimes necessary for the man in charge of a car to take the engine apart for some purpose. Having taken it apart, he next finds it necessary to put it together again. When doing this, he must look carefully to the timing of the engine. He must adjust the cam shaft so that the exhaust valve will close at the completion of the exhaust stroke of the piston. In doing this, he should watch the marks on the fly-wheel which tell him when the piston is at dead centre, up or down, and so on. If the fly wheel is not already marked, as it usually is, he should find out the dead centres himself and mark the fly wheel with chalk. Having fixed the cam shaft in its proper position, he can lock its gear with that of the crank shaft, and the engine is ready to run again. The piston is said to be at the dead centre when it is either as high or as low as it can go in the cylinder.

Whitewashing coal would seem to be a labor so brilliantly useless that one can imagine only the inmate of a lunatic asylum considering it at all seriously. Yet that apparently crazy scheme is carried out by some Western railroads. The coal is whitewashed, not for æsthetic reasons but simply to prevent theft in transit. Before a car of coal starts on its journey the top layers are sprayed with lime-water, which leaves a white coating on each lump of black coal after the water evaporates. The removal of even a small quantity from that whitewashed layer is immediately detected, so that the exact junction or station at which the theft occurred can be noted.

"Sure, I'll do it; glad to; it's just the kind of work I like." It was so rare an expression that half a dozen employes in that big place stopped work and looked at him in amazement as he walked out.

Gasoline Traction Engines

Continued from page 30

Then the engine was put to run a 32 inch cylinder Rumely separator. We experienced little trouble. Once we broke a valve lever and had we not had a good blacksmith we would have been hung up for two weeks through ignorance of repair agents.

The main thing in threshing is to keep the engine going. If the dynamo wire breaks, catch it with the batteries. If another wire breaks, hold it on the place of contact, but keep going. If you have plenty of men and teams you can thresh short haul at noon hour. Three spike pitchers pay better than two.

After about thirty days' run, we secured a good experienced man who helped us out very much. I had depended on oil pump for lubrication and he taught me to put a little into the crank case every day, the splash oiling every part. He taught me to close circuit the battery with a wrench instead of rolling wheel until contact was made, when testing spark. I must say that I was a little ashamed for not having discovered that alone. Then too, he told me to rewire with heavier insulated automobile high tension wire. The result was that we could use our spark plugs longer.

In 19 days we threshed 19,000 bushels of wheat and 16,000 bushels of oats. The outfit did good clean work. We threshed 538 bushels of flax from 25 acres. To thresh flax we had to take out retarder.

The outfit ran about 45 days. On two days we just cleared expenses. The rest of the time we made from fifty to one hundred dollars per day clear profit. We would have done much better had we understood both ends of the outfit better.

Gasoline here costs us 30c. per gallon. We used from one to two barrels per day. The Waterless we found better than engine gasoline. We will try kerosene next summer.

Yours truly,
John Hockin,
Scott, Sask.

Gas Engine Best.

Replying to your enquiry of recent date regarding my experience with gasoline engines, will say that I have had seven years experience with portable and traction engines. First I had a 16 h. p. Flower City portable for threshing, etc., which gave splendid satisfaction. Then I bought a 45 h. p. Hart-Parr gasoline traction engine, which worked very well. Then I bought a 22 h. p. Geiser portable gasoline engine, which has given most splendid satisfaction.

As to the amount of gasoline used. It all depends on the weight of the load that the engine is pulling. In threshing my 16 h. p. would use 15 gallons of gasoline in ten hours. When chopping grain, would use ten gallons in ten hours. The 45 h. p. would use from 40 to 45 gallons in ten hours and the 22 h. p. in threshing used 20 gallons in ten hours.

Gasoline costs me, laid down here 27c. per gallon. I also have a motor buggy which costs about a cent per mile for fuel and other oils.

It would pay any farmer with 320 acres of land to have a small threshing outfit of his own and a gasoline engine is the best to have. He can then do his own threshing and lots of other jobs, with his own help and keep his farm free from noxious weeds which would be brought to his farm with the large outfits.

Wishing you every success.

Yours truly,
J. C. Bryan,
Summerberry, Sask.

Likes the Gas Tractor.

I have long been a very interested reader of your valuable paper and especially for gas engine departments and as you ask for experiences of those who have operated them, I thought I would give you mine, although my experience with the tractor has not been very extensive. I have operated a gasoline engine of the portable type for twelve years.

Our gasoline tractor is a Flour City 30 horse power, four cylinder type and has given excellent satisfaction. It was the first week in October when it came.

We plowed 160 acres and disced 60 acres five times with a fuel consumption of considerably less than two gallons of gasoline per acre. In plowing we pulled 7 fourteen-inch Cockshutt plows and our land is very rolling. We could easily pull eight plows on level land. Discing we pulled five 16-plate discs and handled them nicely except on very steep grades. We are well satisfied with the engine and are satisfied that it is a fuel saver. We have not tried it for threshing, but are more than confident that it would not disappoint us there.

Now, I don't mean to say that the engine ran right along and never gave us the least bit of trouble. There were two or three times when we were hung up with it, but were never delayed over an hour; and let me tell you right here, don't any of you get it into your heads that you can get an engine and go right along without having any trouble at all because you will find out your mistake. You will have trouble with the best of them and the less experienced you are, the more trouble you will have.

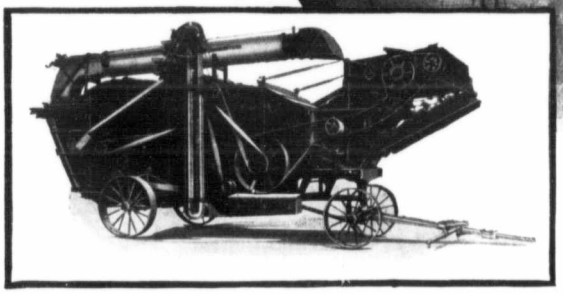
Now, I think I have occupied enough of your valuable time. I have not written this for publication, but if you find some portions which might be of some service to our fellow farmers I will not object to them appearing in your paper. Thanking you for your time and wishing you every success in your grand work, I am,

Yours respectfully,
W. M. Neely,
Govan, Sask.

Don't make a fuss over mistakes, especially over those you cannot correct. If you keep your mouth shut, few beside yourself will notice that you have gone wrong. The world isn't paying as much attention as self-conscious souls think.

Double Separation *beats* Single Separation *as a* PROFIT EARNER

The Reeves Compound Separator
With Mammoth Cylinder.



In this REEVES "Compound" Separator

the upper separating device, itself the most effective ever invented, is re-enforced by a second separating table which in turn is as effective as the whole separating mechanism of most machines.

Remember that point

when buying a threshing outfit. If there is any one thing more than another that will drive away a customer it is to see what he knows to be too large a proportion of his grain going into the straw.

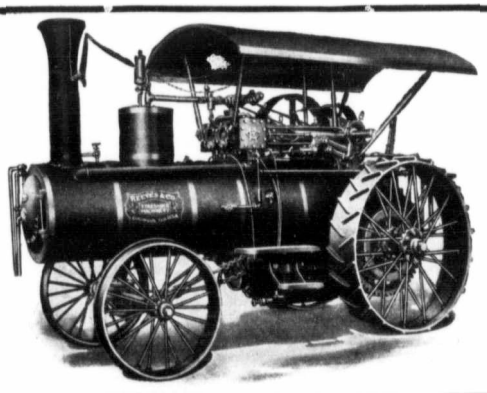
¶You cannot fool a farmer. Most of them have seen a REEVES "Compound" Separator in operation and they know what "real" separation is. REEVES Double Separation tickles the farmer every time and brings you business. Lack of it is liable to cost you many good accounts.

¶A thresherman is known by the work he delivers. Thresh with a REEVES Compound Separator and you will have the satisfaction of knowing that you have nothing to fear from your competitors on this point.

Another Pointer

Don't buy a SINGLE CYLINDER engine without reading the comparison between them and this REEVES DOUBLE CYLINDER ENGINE in the REEVES Engine Catalogue.

After that you won't want one.



REEVES & COMPANY

COLUMBUS·INDIANA·U·S·A·

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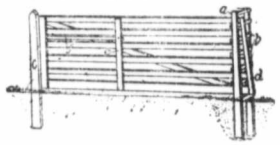
CANADIAN BRANCH: REGINA, SASKATCHEWAN.

Building a Fence

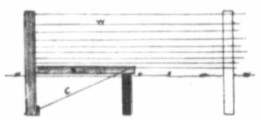
By E. A. JAMES

There are a few principles in fence building, which apply to all styles of wire fence, whether woven or loose wire is used. You have noticed, when passing on the high road, the different types of fence used by different farmers. You will find that some farmers



A well braced gate

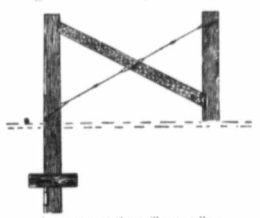
have a good looking fence, one that is taut all the time, no matter what the style used. On the other hand, you will pass farms where the fence is saggy and really an eyesore, even when the very best make of fence is used. What s the difference? What is the trouble? The main



A good form of end bracing

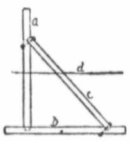
trouble is probably with the end or corner posts, or if those were set properly, the trouble was with the stretching.

The thing most necessary after having bought the wire is to have good posts. They should be long enough to be well set. A post is not well set that is not put deep into the ground. Just here, it might be well to remark that posts may be well set, the wire may be well stretched, and still the fence will be unsightly, because of the posts being out of line; so after having settled on the style of fence, and having secured good posts, one should take just a little care in the settling of posts, in having them line up. Remember,

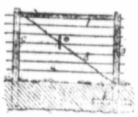


A corner post that will not pull up

you are building for years to come. A little careless work in the building remains throughout the life of the fence. It can be seen every time you come near it. It isn't much more work to set posts in line than to set them in a haphazard manner. One can afford to spend an extra day, if need be to get posts well lined. A well made and neatly lined fence, is a pretty sight to behold. Now, for the corner or end posts. Special care should be used with them. They should be set deeper than the intermediate posts. They should also be heavier. Oftentimes one is in a hurry, and after digging a 30 inch hole, especially if in tough clay or stony subsoil, one will say, "let it go at that." But stop and think a moment. It might take half an hour to dig ten or twenty inches deeper for that end post, it might take more, and in contemplation one gets discouraged. Remember that that extra hour's time may save you days of labor in the future. When once you get your end post securely set and well braced, you have something to tie to. On the other hand, a little carelessness will mean much labor in the future, as the post will, in all probability, begin to give, and thus the wire will become slack. When once it loses its tension, it

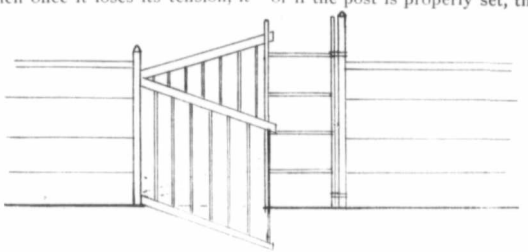


Braced up and endwire

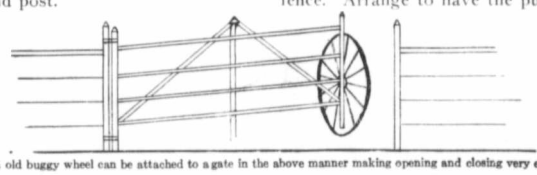


Nicely braced

becomes a poor fence. Then, if it is not attended to, it soon becomes an eyesore. Not only that, but it is very difficult to bring it back into place again. It will require hours of time to repair what a few minutes' care would have saved. A 9-foot post is not too long for an end post.



A convenient form of gate that is always closed



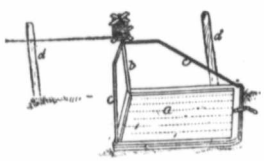
An old buggy wheel can be attached to a gate in the above manner making opening and closing very easy

The illustration herewith is a very effective method of bracing. Here, again, is a place for careless work. A poor brace will spoil the work of a well set end post. Use something as heavy as 4 x 4 or even heavier, if the brace is to be a long one. Mortise the ends to their respective posts, the upper one about three and one-half feet from the ground. Then use heavy wire for bracing diagonally, in the opposite direction, having double length of wire, one end at the top of the post and the other end at the bottom of the other post. Stretch rather tight. Then, with a hammer handle or any other tool, twist above and below the wood brace in opposite direction until both wood and wire brace are under strong tension. Staple the wire brace to the posts, and also to the wood-brace. Thus you prevent the end post from twisting in the ground when you use the stretcher.

In giving directions for putting up wire fencing after the posts are set and the ends braced we quote from one of the largest manufacturers in the country as follows: "Unroll the fence on the ground the bottom bar next to or towards the posts. Raise one end of starting post and staple each bar of the fence with No. 6 staples (use 1½ inch staples for soft and 1¾ inch for hardwood posts) just enough to hold the fence in place. Start the fence so that there will be enough of each bar to go clear around end post and splice. See that the first stay is perpendicular, starting post and staple each bar or if the post is properly set, that the first stay is parallel with the post. Attach the stretcher-head to the training post by passing the post-chain through the clevis and around the post, drawing the stretcher-head as close to the post as it can be operated. Attach the wooden clamp to the fence. Arrange to have the pull, so that there will be the same number of bars above and below the stretcher-chain hook. Place the wooden clamp between stays, never over stays; neither should the wooden clamp pull against the stays but be absolutely clear of them. Turn down the nuts securely so that none of the bars can possibly slip in stretching. Remember, the top and bottom bars are larger than the intermediate bars, and unless the nuts are turned down securely, the larger bars will hold the clamp members apart, and allow the intermediate bars to slip.

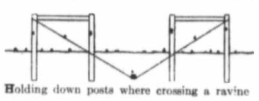
Attach the large hook on the stretcher-chain to the wooden clamp, and the other end of the stretcher-chain to one of the dogs or claws on the stretcher-head. Work the stretcher until you can see how the fence is going to pull up. Be sure the stretcher-chain is not twisted, as if it is, the dogs cannot take hold of it. If the appearance of the fence, when slightly stretched, indicates the fence is properly attached to starting post and is going to pull up all right, go to the starting post and wrap each bar clear around the starting post; work the stretcher from the back of the fence—that is, the side of posts opposite that on which the fence is stretched. Watch the fence as it tightens; if it is inclined to crush on top of elevation, raise it to its proper position on the posts and put one staple over second bar from the top—do not drive the staple clear in, but just far enough to hold the fence up so that the fence can pull through it without interfering with stays. If the fence raises too much in low places step on the bottom bar and fasten to place with staple, following substantially the plan of fastening the top of fence over elevations.

Stretch the fence until it is all under strong tension and the tension curves are much reduced



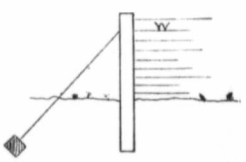
A convenient wire reel

in size. When through stretching with the large stretcher, take a smaller hand stretcher and draw the slack out of each bar between the wooden stretcher-clamp and the straining post, fastening these bars by thoroughly stapling. Bring the top of the fence to where you want it and staple. Treat the bottom



Holding down posts where crossing a ravine

bar in like manner. Staple a number of intermediate posts, BUT BE SURE THAT STAPLES IN INTERMEDIATE POSTS ARE NOT DRIVEN DOWN HARD AGAINST THE BARS OF THE FENCE. The only staples that should be driven



A wire brace on the corner

down hard are those in the end posts—all other staples should have free play. Take off the stretcher, and if the work has been properly done, the fence will be under good tension throughout.

Seventy Years Experience Behind These

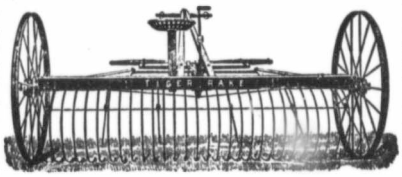
FROST AND WOOD

Farm Implements

AND you can take it for granted that there are none to equal them in Canada to-day. The older men in the agricultural world know this to be a fact—the younger ones are learning it.

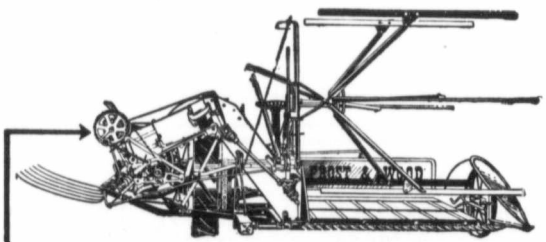
You'll need some of the implements described here, because, like every other farmer, you'll want to harvest your crops efficiently at the lowest cost and with the least labor and trouble. Don't put your orders off till the last minute —get our Catalogue and select what you want in good time, so that you'll be well in hand when harvest does come.

This illustrates our popular Tiger Rake, which is built in three sizes, 8 ft., 24 teeth; 9 ft., 28 teeth; 10 ft., 30 teeth. With the exception of guide board and shafts, it is made entirely of steel and is therefore very strong and light. It has an automatic Foot Dump, so that there is absolutely no labor required to operate it, the horse or horses doing all the work. Another exclusive feature is our new automatic locking device for holding the teeth up when the Rake is not in use.



FROST and WOOD RAKES

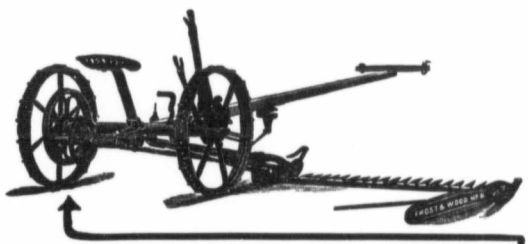
We bend the teeth from a special quality of spring steel, temper them thoroughly, so that they are well equipped to stand all strains. The Rakes are equipped with under-cleaners unless otherwise ordered. The 9 ft. and 10 ft. Rakes are equipped with combination Pole and Shafts and supplied with steel wheels only, 8 ft. Rakes can be shipped with wood wheels if required. Write for our Catalogue and go over our whole line of Rakes; we know we have just what you want.



FROST and WOOD BINDERS

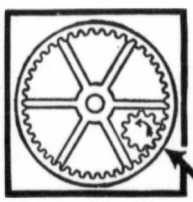
This binder is positively in a class of its own—far ahead of any other machine on the market. We haven't room to detail all its many excellent merits here, but we do want you to consider one important feature—our Eccentric Sprocket-Wheel.

Notice that there are **three long** spokes and three short ones—based on the old leverage idea, the longer the bar, the greater the power. When the grain is being compressed and tied, the packer arms require all the power they can get to make nice tight sheaves and the chain which drives the Eccentric Sprocket is then pulling over the long arms of the wheel, exerting a steady powerful draw. After the bundles are compressed and tied the chain has reached the short arms of the Eccentric Sprocket and must therefore travel faster, thus the bundles are discharged quickly and everything is ready again for another bundle to be compressed, tied and discharged. In short, the long arms develop **power**, the short arms **speed**. But get our Catalogue and go into the whole details carefully yourself.



FROST and WOOD No. 8 MOWER

Here's another case where space prevents us giving all the good points, so we urge you to write for our Catalogue if you are thinking of buying a reliable Mower. Ours are built in various sizes from 3 ft. 6 in. cut to a 7 ft. cut. You will notice that the small gear wheel is inside the large one on what is called the **Internal** Gear principle. Both these wheels travel in the same direction. Now, on most Mowers the gears are arranged exactly opposite, the small gear wheel being on the outside. This is a decidedly bad feature, because the wheels work one **against** the other, causing a great amount of friction, wearing down the cogs and eventually a loose connection. You can easily prove the superiority of the Internal Gear Principle for as soon as you drop the bar and start the team the knives begin cutting. There is no lost motion, no jerks, no backing up—the action is immediate. Our Mower is liberally supplied with Roller Bearings—ensuring long life and light draft. It is made of first-class materials and put together by expert workmen. Let us send you the whole story to read at home—free.



Write to Our Sole Agents in Western Canada

COCKSHUTT PLOW COMPANY LIMITED WINNIPEG

BRANDON REGINA SASKATOON CALGARY EDMONTON

Practical Talks to Threshermen

Conducted by PROFESSOR P. S. ROSE

TALK No. XXXII.

In the last lesson we figured how much profit a man might reasonably expect under *average* conditions who owned and operated a large outfit such as is used in the Northwest. The threshing was restricted wholly to wheat in order to make easier figuring and because it was assumed that other kinds of grain were charged for at a proportionate rate, which if true, would make the figures presented practically correct. In this discussion it was assumed that no other work was done besides threshing. However, most threshermen have some side issue that they can turn their attention to at other seasons of the year. This extra work may be grinding feed, shredding, sawing or plowing, depending upon the section of country in which the thesherman is located. Our thresherman in the Northwest will almost certainly engage in plowing and it will be interesting to see how he will come out financially in this venture.

In order to engage in this business he will find it necessary to invest in a plow frame and plows that will cost approximately $1,200.00.

We will assume that he does thirty days plowing per year and that he receives one dollar per acre for stubble plowing. His crew will consist of an engineer, a fireman, who also handles the plow, and a man and team to haul coal and water. Oil will cost him about a dollar per day, repairs on an average of about three dollars per day, and coal about twelve dollars per day. In threshing he used straw, but when it comes to plowing he will find it necessary to use coal. His total daily expense account may now be tabulated as follows:—

Engineer's wages ..	$ 4.00 per day
Fireman's wages ..	3.00 per day
Man and team	4.00 per day
Repairs	3.00 per day
Coal	12.00 per day
Total	$27.00

In addition to this he must charge interest and depreciation on his plows. If money is worth eight per cent., the interest on $1,200.00 will amount to $96.00 per year. If the plows last as long as the rest of the outfit, eight years, there must be charged $120.00 per year for depreciation. The sum of these two items amounts to $216.00. If we divide the sum by thirty, the number of days during which the outfit work, we obtain $7.20 as the daily charge for interest and depreciation. This, added to the daily labor account, shows a total expense account of $34.20. Assuming a dollar per acre for plowing we see that our friend will be obliged to average thirty-four and one-fifth acres every day to meet expenses and all over and above this amount will be profit.

In most business enterprises twenty per cent. is considered legitimate profit on the capital invested. If we apply this rule to the case in hand we find that the profit should amount to $240 for the season or eight dollars per day for thirty days. This represents eight acres more per day, thus bringing the average acreage which must be plowed up to forty-two and one-fifth acres per day.

Now let us see if this is a possible average to maintain. Most plowing engines are geared to run at from two to one-fourth to two and one-half miles per hour. Counting the necessary stops, two miles per hour would be a good average of speed for the entire day. If the engine works twelve hours per day it would travel a total distance of twenty-four miles. This represents a distance of 126,720 feet. A fourteen-inch plow traveling this distance would turn one and one-sixth times 126,720, or 147,840 square feet. There are 43,560 square feet in an acre and a simple division shows that one plow bottom will turn about 3.4 acres per day. In order to turn forty-two and one-fifth acres it would be necessary to use a twelve-bottom gang and to make a trifle more than twenty-four miles per day. In good sandy loam it is possible, if the fields are large, to draw the twelve-bottom plows and to make the average I have figured, but it will require hustling every minute of the time. As a matter of fact forty-two and one-fifth acres is a high average. I have record of one case where sixty-seven acres of stubble were plowed in a single day, but this is a very exceptional performance. Taking one day with another, it is doubtful if an *average* of forty acres per day can be maintained for a period of thirty days. If it can not be, it is very clear that plowing can not be done profitably for one dollar per acre.

The objection may be raised that in this matter of plowing, no account was taken of the interest on the money invested in the engine. This may be an error or not depending upon how the matter is considered. It will be noticed that I assumed the rig to have been bought primarily for threshing and the interest and depreciation was charged to that account. The matter of plowing was considered afterwards and I figured the profits and performance on this "side issue" separately, on the basis of one dollar per acre. This price is quite evidently too low and should be at the very least $1.25 per acre.

If plowing is to be considered in the beginning, before the rig is purchased, the matter of interest

and depreciation on the engine might be divided among plowing and threshing. This is the correct method to pursue since it divides the charge in the proper proportion and shows the owner exactly how much he should charge for each kind of work. If worked out on this basis it will show that the threshing may be done for a trifle less and that the plowing will cost more. This is the correct way to figure since it distributes the charges where they really belong and does not compel one part of the business to pay for the losses in another part. In other words the owner will figure in such a way as to make all parts of the business pay a reasonable profit and be enabled to fix his charges accordingly.

To show how this method works out, let us figure the problem from the beginning, using the data we have obtained as a basis of computation. We will also figure a profit of twenty per cent. on the investment as this is the profit the "Society of Equity" maintains a farmer should make.

We will assume that the engine and necessary accessories cost, when delivered in the field ready for work, $2,700. The separator and cook car amount to $1,300 and the plows to $1,200.

The engine works fifty-four days per year, the separator twenty-four days, and the plows thirty days.

Interest on $2,700 at 8 per cent.	$216.00
Interest to be charged to each working day of engine	4.00
Interest on $1,300 at 8 per cent.	114.00
Interest to be charged to each working day of separator	4.67
Interest on $1,200 at 8 per cent.	96.00
Interest to be charged to each working day of enplows	3.20
Depreciation of engine per year, one-eighth of $2,700	337.50
Depreciation of engine for each day at work	6.25
Depreciation of separator per year, one-eighth of $1,300	$162.50
Depreciation of separator per day	6.77
Depreciation of plows, one-eighth of $1,200	150.00
Dpreciation of plows per day	5.00

For each day's threshing our expense account will now be as follows:

Interest on engine at 8 per cent.	4.00
Interest of separator	4.67
Depreciation of engine	6.25
Depreciation of separator	6.77
Board of crew	10.00
Wages for crew	78.00
Repairs, oil, incidentals, etc.	3.00
Total daily expenses.	$112.69

If the business must pay twenty per cent. profit per year, we find that the engine must pay a total profit of $540.00 or $10.00 per each working day. The separator must show a profit of $260.00, or $10.83 per day; thus the profit for each day's threshing should be $20.83. Adding this to $112.69 gives us a total of $133.53 that the rig must earn per day threshing. If wheat is threshed for nine cents per bushel a day's work will consist of 1,483 bushels. If a larger average than this can be maintained the price of threshing may be reduced.

Our daily expense account for plowing will now have the following items; to wit:—

Labor, fuel, oil, repairs, et c.	$27.00
Depreciation of engine	6.25
Interest on engine per day	4.00
Depreciation of plows	5.00
Interest on plows	3.20
Total daily charge	$45.45

Since the engine is supposed to pay a profit of $10.00 per day and the plows twenty per cent. on their cost, or $4.00 per day, we have $14.00 to add to the above, making $59.45 as the total daily earnings of the engine and plows in ordr to make their proportion of the total gain.

If forty acres per day be estimated as the average day's work it shows that the price for plowing should be about $1.50 per acre.

It may be urged by some readers that my figures are not strictly accurate, and that my estimates are misleading, but it must be remembered that these figures are based on a single locality, and furthermore that my aim and object in presenting them is to impress upon threshermen the necessity for making close estimates and if possible show how these estimates should be made.

"Shucks"

The other day I heard a farmer telling about the failure of his corn crop. It seems that his corn had been affected in a most peculiar manner. It looked well, and he thought that he had an unusually good crop, until husking time came. Then he discovered, as he expressed it, that it had "all gone to shucks." the ears were quite small, but were encased in such a thick covering of husks that they appeared prodigious to the superficial observer.

As I listened it occurred to me that people are sometimes afflicted with this same strange malady. You have doubtless observed persons among your acquaintances who have "gone to shucks." Take Miss X, for example. She wears fine clothes and a picturesque smile; she can talk as glibly as a gramophone about the baseball game or about "that horrid Miss Y." But if you know her a few weeks you will find that she is all shucks. Frills and smiles are all right in their place, but they don't make a girl, much less a woman. Giggles and clothes are merely the husks, and some husks are necessary. But if she has developed into giggles and clothes, to the exclusion of brains, character and common sense, you may set it in your notebook that she has "gone to shucks."

You have met the young man whose glib tongue and worldly-wise air commend him to the favor of fools. He has no brains, but displays as a substitute a scenic vest and hand-painted socks. His character is as spotted as his rainbow-hued necktie, and his laughter is as hollow as his head.

Or perhaps he is merely a smooth talker who knows how to adjust his manner to his circumstances. With the silly he is foolish; with the sober, grave; and with the learned, wise. A very Steerforth, suiting his mood to yours; entertaining, amusing, flattering, and all the while concealing a treacherous and vicious nature behind a warm hand-clasp and a winning smile.

In either case he is all shucks. The appearance of the covering may be different with different individuals, but if he is all shucks and no man, you would do well to avoid him. Character will outlast shucks and will give more satisfaction in the long run.

"What's that you call your mule?"

"I call him 'Corporation,'" answered the old colored man.

"How did you come to give him such a name?"

"F'um studyin' de an'mal an' readin' de papahs. Dat mule gets mo' blame an' abuse dan anyt'ing else in de township, an' goes ahead havin' his own way jes de same."—Washington Star.

The Thresherman's Question Drawer

Answers to Correspondents

Answer of C. F. to questions of C. R., Pense, Sask.

1. To store leather belts, first rub them with castor oil, then roll them up and store in a dry place.

2. It is not good practice to put fat or valve oil on belts. Use some good belt-dressing.

3. Soap is not good for leather belts, although it has been used with good results.

4. No. But it is better to run a belt a little light than have it cause trouble by slipping.

5. It is impossible to give a formula for a boiler compound that will do for all kinds of water. You would have to have your water analyzed.

6. Do not remove the cylinder, but take off cylinder head and smear cylinder oil all over inside of cylinder. Then turn engine over to work oil under piston and replace cylinder head. It is a good idea to remove all brasses from the engine and boiler. Clean them and put away in a dry place.

7. It would take a whole page to answer this question in detail. Good results may be had by building up false pillow blocks, wooden bearings, and wedge.

8. Suppose you have an engine with a 10-in. stroke. Place the engine on dead centre, then turn the fly-wheel until piston has travelled 5 inches, or half the stroke. Now, if you look at the crank, you will see that it lacks several degrees of being half stroke. This is caused by what is called the angularity of the connecting rod. This same angularity of the connecting rod will cause the piston to travel faster on the first half of its stroke than on the second half, while the crank travels at a steady speed.

9. In some engines the "engine proper" is made to follow the reverse, while in others the engine road wheels follow the reverse. It is simply a matter of taste with the manufacturers.

Answer of G. Y., Brancepath, Sask., to question of G. S., Waterous, Sask.

In The Canadian Thresherman and Farmer I see you are a little up against it with your boiler, and your troubles seem to be exactly the same as mine used to be. There was one time I considered my 22 h.p. Minneapolis engine wasn't worth as much as a good 10 h.p. Dinger horse power, but to-day I would not turn away from any 25 h.p. engine on the road. It is a lovely steamer, and in the belt; well, we don't seem to be able to stick it.

Now you say you cannot keep your flues tight. Well, this might be the case, and yet not the fault of the boiler or the flues at all. Are you sure that you are not making steam enough in that small boiler to drive a fifty h.p. engine? This is just where I fell down for many years, and the whole trouble was right in the valve. The valve was set in such a manner as to let in great volumes of good, powerful steam just when it was of no more use to the engine than cold air would have been. One night, when I was sitting reading The Canadian Thresherman, I chanced across an item explaining how to set a valve. When morning came, I went right out and took the paper with me and followed the directions right through, and when the old Minneapolis was started on its run that day, not a man on the job would have believed it was the same engine, only that they knew it. From that day to this the firing has just been a pleasure, and leaky flues are certainly a stranger to me. I put in a set of flues in my boiler two years ago, and it has threshed two long falls and drove a sawmill all last winter, right out in the open air, and the flues are just as tight to-day as the day I finished putting them in.

Now about the boiler. Mind, setting the valve is not the whole secret. See to it yourself (do not at any time trust an engine to hired help) that your boiler is thoroughly cleaned out once a week when working, and do not stop until every speck of dirt is washed out. I always put in a tomato can full of black oil when I finish washing out. Some don't like this, but I do.

Now a few lines about putting in flues. Right here is where you can head off a heap of trouble, but whatever you do, do not rim out those flue holes in the boiler when putting in the flues. When putting in the flues, make a good fire and heat the ends of your flues (both ends) until you get them red hot. Then, while this heat is on, stand them in lime that is air-slacked, to cool. Then, when cool, take a file and file the ends until the steel shines. Also take a round file and shine the holes in the boiler. Always pick out the thick end of the flue for the fire end. Hoping this will aid you.

C. M. HAMIOTA, MAN. **Q.** I have a 12 h.p. engine cylinder 7½ x 10; the outside diameter of this cylinder is the same as 16 h.p. cylinder of the same make of engine, but with smaller bore than the 16 h.p. If I have the 7½ x 10 bored out to 8 x 10 would it give more power without changing or enlarging the steam pipe or governor? Governor is 1¼ inch. Would it give the same power as the 7½x10 without using any more steam?

A. It would not be necessary to enlarge your steam pipe if you bore your cylinder out to eight inches in diameter. Some 8x10 engines have a 1¼ inch pipe, while others have a two-inch steam pipe. You will not be able to notice the difference in the working of the engine if either size is used.

Taking your 7½x10 engine at

12 h.p. (normal) the power will be increased a little over 1½ h.p. if you change it to 8x10, providing it is run under the same conditions.

To do the same work with the 8x10 would likely take less steam, especially if the 7½x10 engine was too small for the work. The reason for this is that the valve gear on the 8x10 engine can be hooked up a little closer, thus using the steam to a higher degree of expansion.

L. D. STONEWALL, MAN. Q. Why is a piston valve engine more apt to break its cylinder head than a common D valve engine? Does not the water have the same chance to get by the valve?

A. The piston cannot push all the water out of the cylinder either in a piston or a D valve engine, for the reason that the valve closes the port for compression at about three-fourths of the stroke. Thus the steam is compressed about one-fourth of the stroke. If there is more water in the cylinder than the clearance will hold, when the port is closed the D valve will be lifted from the seat to let the water out of the cylinder back into the steam chest and into the exhaust port, but in the case of a piston valve, it not being able to leave its seat something has to yield when there is more water than the clearance will hold. Usually there is a relief valve on the ports which has a spring and acts like a regular safety valve. The spring is set so that it will not open when the regular pressure is on it, but as soon as the pressure becomes greater, due to the penning up of the water, the spring will yield and open the valve, thus saving the cylinder head and other parts which may be broken due to the water shock. These valves are sometimes too small to let the water pass free enough and the engine is sometimes broken from this cause.

H. N. GOVAN SASK. Q. Why is the boiler problem getting to be such a serious one? I know of some real old boilers which have their first set of flues. In modern boilers the flues last from one to five seasons. Is it the material and workmanship or in the different way they are handled?

A. When the "real old" was built, it was large enough to run its engine to do the work which was required of it at that time, which was, say a separator. It could do this work quite easily at from 60 lbs. to 80 lbs. boiler pressure. If these old engines are run at the same rate now or at a slight advance in pressure they are still durable engines. By and by, and one after another, the automatic stacker, the pneumatic stacker, the band cutter, the bagger and weigher were hitched to the separator and practically the same size engine and boiler is doing this additional work to-day. When the engine is found to be too small the safety valve is reset. The boiler is made heavier, the engine is thickened at its weak places, but the same general dimensions are maintained. The tubes have the same spacing that they had, the water space around the firebox about the same, only a little less, due to the extra thickness of the boiler plate. The engine having to do much more work, thus the boiler has to evaporate more water, and the more water evaporated the more sediment in the boiler. The pressure raised from, say, 80 lbs. to 150 lbs., will make about 140 degrees higher temperature in the boiler, thus a hotter fire. In some cases of spacing of tubes and water space around fire-box, the space is so scant that the extreme heat drives the water away from the sheets and from between the tubes and thus causes trouble.

G. L. STETTLER, ALTA. Q. To what pressure should a cold water test be made? Is this a reliable way to test a boiler?

A. Most authorities require double the working pressure for a water test. The hydraulic test when applied to boilers, should always be accompanied by careful sets of gaugings, lines being strung across the parts to be gauged, and measurements taken, before, during and after the test, to ascertain the amount of bulging, and also the permanent set, if any. A blind pumping up of the pressure without any regard to the behavior of the structure is calculated to do more harm than good. The test should only be applied under the supervision of a specially skilled man.

Disastrous explosions have occurred from the practice of inexperienced persons along this line. Instances have occurred where boilers have burst shortly after they have been tested by hydraulic pressure much beyond the working pressure. It is like an engine pulling a heavy load up a steep grade and then breaking while going down on the other side of the hill when the engine is practically pulling nothing.

R. Y. NOBLE ALTA. Q. I have a Woolf compound engine that runs nice and smooth with 100 lbs. of steam or less; when it gets above 100 lbs. it jerks and pounds on the reverse gear; especially so with a light load. What is the cause and how can I remedy it?

A. A lack of cylinder oil is often the cause of a hard running valve gear. The increased pressure makes the valve run harder, due to extra load. There may be some worn parts in the valve gear and the extra load will cause it to "jerk" or rattle. It is likely that if you take up all lost motion in your valve gear and use a good quality of cylinder oil and plenty of it you will get your engine over its trouble.

Li'le Ephra'm says—Ah had a fried chanticler hat foh dinnah yistaday.

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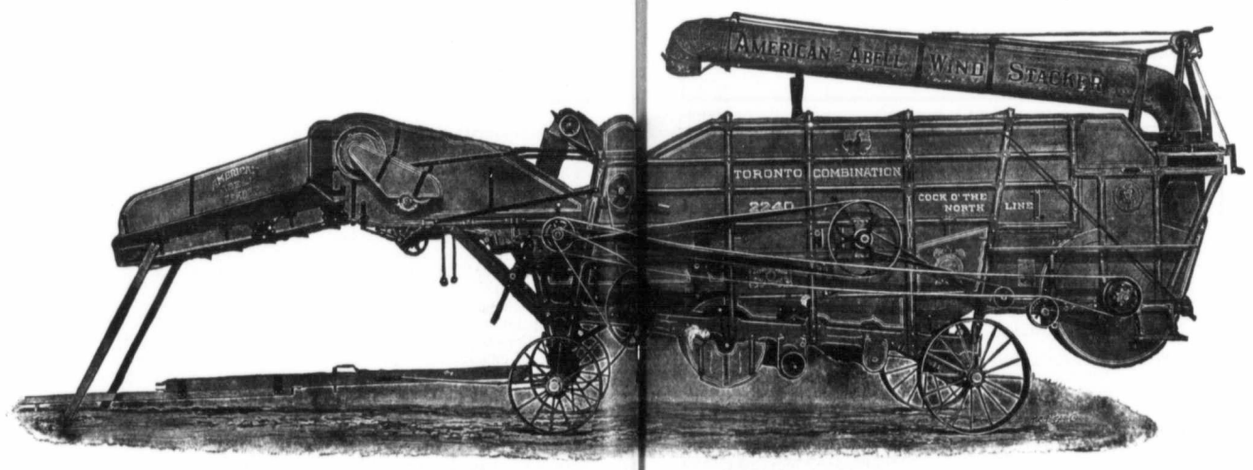

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Farmer Shiftless moves along
The same old shiftless way.
The burden of his daily song
It "farmin' doesn't pay."
His tools are housed beneath the blue,
His stock in a leaky barn;
He loafs around the whole day through
And spinks full many a yarn.

Farmer Stirring hustles 'round
And gathers in the gold;
In the city bank he has much funds
Received from crops well sold.
His neighbors say, "he prospers well
In all he undertakes,
And from his well-tilled fertile farm
A royal living makes."

M. L. Piper.

The Importance of the Farm Machine upon the Farm.

By Ernest J. Trott.

A second prize essay, 1st year student in Canadian Thresherman and Farmer contest at M.A.C.

Man, from the earliest ages, has striven towards obtaining a maximum amount of work done in the least possible time and with a minimum of expense.

This aim has influenced all those who have endeavored to improve the conditions of labor in that particular branch of work to which they have given their careful attention and study.

The aim in the worker's mind has always been the same, but the methods employed in attaining that end have varied according to the nature of the task. In all the sciences we find inventions leading up toward a certain definite end and we know also that, in agriculture at least, the end is not yet attained.

To a certain extent this is surprising, in that agriculture is the oldest of all professions and that the world depends upon it for its sustenance.

However, this may be, it is nevertheless a fact that up to a hundred years ago no radical advance was made toward improvement in the implements employed in farm work.

About that time, however, people seemed to realize that any labor saving device would not only be a benefit but a distinct advantage in operations on the farm.

Farm machinery, of a kind, has always been used but from the beginning has been most primitive until the great advance made in general manufacturing during the past century became general. The cheapening of the cost of iron and steel and the use of labor saving devices so demonstrated the value of improved methods, that even the farmer began to see it would be to his advantage to practice economy in the use of manual labor.

Looking at it from the economic side we find that thirty years ago it took 3 hours 3 minutes, at a cost of 17¾ cents, to purchase one bushel of wheat; to-day, with the aid of improved machinery, we do the same work in 10 minutes at a cost of 3½ cents. Machinery does practically 750,000,000 dollars worth of work in raising the crops each year in the United States.

Again, let us imagine for a moment the labor saved to the individual himself. In place of the dung-fork and backache we have the modern manure spreader, performing the work at a cost of 50 cents lower than the old method and increasing the value of the manure 50 cents per ton. Then, where the cradle was swung with such vigor in bygone days and women followed to bind the sheaves, while children found lucrative employment gleaning the fields, the binder or harvester does the work with greater despatch, at a lower cost and with less loss.

The mere fact of the number and variety of machines used in agricultural pursuits to-day is a proof of their value and popularity. The benefits derived, however, are of more than pecuniary value. Instead of the slow-moving, stolid character of the old time farm assistant, whose very existence was necessarily only on a par with his surroundings, we have bright, earnest wokers of both sexes whose lives are not enclosed within the encircling fences of the farm, whose sympathies and intelligence are only bounded by the realms of space.

The Status of False wild Oats

By Norman Criddle.

Paper read at Saskatchewan Winter Fair, Regina.

I have been asked by your Secretary, Mr. Newman, to prepare an introduction to a general discussion on the important question of White or 'False' wild Oats in relation to the seed grower in particular and farmers in general. To begin with it may be well to mention that these so-called white wild oats are by no means a new discovery in Canada. The late Dr. Fletcher received specimens at least ten years ago and made numrous experiments which I believe led him to the conclusion that they were not true wild oats. Unfortunately the time at his disposal prevented him from concluding the work and much of the data collected was lost through his death.

It has always seemed to me that the reason for the present prom-

inence of false wild oats is not entirely due to their being less numerous formerly, but because we have only recently learned what to look for. A moment's thought will show that false wild oats were hardly known to the average farmer ten years ago.

To begin with, what is a false wild oat? The question has already been answered in part by Dow Brothers and Mr. Cooper in the Nor'-West Farmer as well as by some notes of my own. In brief, a false wild oat is an ordinary oat of any variety with the outward appearance of a wild one. The plant is an exact counterpart of a cultivated oat—Banner or Tartar King—type but can at once be distinguished by the long awns protruding from every spikelet and attached to each individual oat. From wild oats they differ in having stouter stems and usually heavier oats and also by a more upright growth. Wild oats have longer and more slender pedicle. They also have a more spreading appearance and usually stand above other grain. Unfortunately there seems to be no distinguishing line between the seeds of true wild oats and false, for though sports can usually be recognized by their size and close similarity to the variety from which they originated, yet intermediate forms occur, some of which so closely resemble the wild species that their correct identity can only be guessed at, and consequently the growing plant will probably always remain the final arbiter. This, however, applies more to the east where small varieties are often in demand. In the west the larger oats grown should make separation of sports from wild oats comparatively easy. We have also to bear in mind that the statement very generally taken for granted that true white wild oats, or albinos as they are often called, revert to black when grown, has not been proved conclusively and indeed there is some evidence pointing to an opposite conclusion. We should, therfore, be wary under that head until further experiments show what the facts are. The title 'white wild oat' for sports is a misnomer, firstly because they are not wild oats and secondly because there are black sports also.

The question of how 'False Wild Oats' have originated is somewhat speculative. Competent botanists claim that constant crossing of species or varieties has a tendency to break up characters in which case some individuals might reasonably be expected to revert towards their original parents or a species with which their ancestors had been crossed. That these sports retain certain characters and adopt others without exception is due to some form of correlation which is unnecessary to discuss here and I think, taking these facts into consideration, that we can come to but one conclusion, namely, that false wild oats show undoubted relationship to wild oats and therefore their original progenitors must either have been a species with wild oat characters or wild oat blood has been introduced at some time since. You have noticed that false wild oats seem to be specially numerous in oats recently introduced. Now is this due to crossing with wild oats or to a general breaking up of varieties by too much crossing? The chief question for this meeting to take into consideration is—How are we to class false wild oats? They are not wild oats and so far as experiments go do not show the most objectionable features of wild oats, namely, retarded germination or the power to retain vitality without growing for several years, nor does there seem to be a tendency towards further degradency. But would it not be wise to carry on other experiments to make sure? This is one of the questions for consideration, but the principal one is still 'How are we to class it?' It is objectionable on account of its long awns, which will naturally tend to cause shelling when the grain becomes ripe, besides it is an impurity, but is it a dangerous one? Can it be classed with wild oats? It seems to me if I read the evidence aright that the answer should be 'No,' unless false wild oats reproduce more rapidly than do the common cultivated ones and the evidence does not show this. There is no reason why they should ever become much commoner than they are now. I think the general farmer need have little fear of false wild oats. As to the grain grower, he desires above all things to have absolutely pure seed and therefore it seems to me that a false wild oat is as much an impurity as a black oat would be among white. Can it be classed as a weed in any other sense? I think not, but don't let us be too hasty in arriving at decision. More experiments are absolutely necessary to come to the final conclusion. It is surely much wiser to keep your prisoner than to give him his liberty hastily on insufficient evidence and find out afterwards that he is guilty.

The Status of the False Wild Oat

By Geo. Dow, Gilbert Plains, Man.

Paper read at Saskatchewan Winter Fair, Regina.

It gives me great pleasure to be present at this meeting of Western members of our Association, and especially to have the privilege of supporting a gentleman of Mr. Criddle's ability, in a discussion on "The Status of the False Wild Oat." I am here in the expectation of learning, rather than of contributing much of value to the discussion.

The question of false wild oats, or perhaps I had better say white wild oats, is one which has particularly interested us for several years in connection with our work as members of the Canadian Seed Growers' Association. It was forcibly brought to our attention by the discovery of a few of these intruders in a lot of our Banner oats, grown from registered seed. We had always been very careful in the work of selection, and the threshing of the grain from our seed plots, so were at a loss to

account for the presence of these sucker-mouthed specimens. At that time of course we had no reason for believing them to be other than really wild oats, or at best a hybrid of the wild and cultivated varieties. I may say, though, that before this time we had noticed a tendency towards increase in the size of the awns on some of our oats. This was regarded as an evidence of increasing strength in the seed, and was so remarked by an official of the "Seed Branch," to whose attention it had been called. It probably has, however, some bearing on the question under discussion.

Determined to keep clear of the wild oats, we decided to take up the handpicking of our "Improved Registered" seed, and to chop all feed grain, in order to remove all danger of sowng them. The first season after this had been commenced, we were surprised to find a few specimens in our "General Crop" seed. Very close searching was necessary to discover them, but still they were there. This was very discouaging, and almost caused us to give up the work of selection with oats. We determined, however, to make further efforts, both in the field and by hand-picking the threshed grain to get rid of these pests.

Matters stood thus when we happened on a specimen which had not been separated from its pin oat. We were surprised to find that this pin oat had no sucker mouth, and that therefore the one point which was regarded as positive proof of wild oat, was missing. An examination of really wild oats showed it to be present in both the main and the secondary kernels.

These circumstances taken together, caused us to observe more closely and specimens we might obtain, and when about this time we undertook the hand-picking of a quantity of another variety of oats, we were specially watchful for any new points. This lot had become mixed with the wild ones, both of the real type and the type we now recognize as false. We learned that the false type were of several different colors and especially that many of them were true to the type and color of the variety in which they were found. We also found that in more than 65 per cent. of the cases where the sucker-mouth was present on the main kernels it was missing from the attached pin oat.

Before this we had noticed that, while the really black oat was lean and slim, and always more or less hairy, the type we had been studying was always large and plump for the variety; often the largest and plumpest to be found in the sample from which they were taken. The only resemblance to the others being the sucker-mouth and large twisted awns.

We were now forced to accept the conclusion, that these were really diffrent from the wild oat, and were in some way produced from the variety in which they were found. This especially, as where they have been found in our own oats they were clearly of the Banner type. Determining to put this to the test, we selected during the winter of 1908 and 1909, from a quantity of threshed oats, a number of kernels having large twisted awns, and more or less extended bases. In some the base was slightly hairy, in others not. These were sowed last spring. The result was interesting, not to say surprising, proving as it did the possibility of the sucker-mouth being produced by individuals which did not themselves possess it. Of the kernels without sucker-mouth, which were sown, 50 per cent. produced plants bearing it, not only on the main kernels, but also on the second, and where present, on the third kernel as well.

On the other hand, where kernels having the sucker mouth and the accompanying pin oat without the sucker-mouth, were planted, both produced it but on the main kernels only. The second kernels had a more or less extended base, with or without hairs; the third kernels were present, different in no way, apparently, from an ordinary white oat.

This is the sum of our experience with false wild oats. Up to last fall we had no idea that others were having any experience along the same line. It was therefore with great interest and pleasure that we read an article from Mr. Criddle, and later one from Mr. Cooper, confirming the view at which we had arrived. As to the place of the false type in the list of weed seeds, although properly to be classed among weeds, we believe that a full knowledge of its real character will show that it should not be as one of the more noxious. If, as seems possible, it comes and goes within the variety in which it is found, its worst feature will be the danger of its being confused with the real wild oat. This danger is regarded by some as sufficiently great to justify the judges at Seed Fairs in rejecting samples containing them, even though the existence of the false type be admitted. Personally, we are of the opinion that the two types can be readily distinguished. As stated before, the false type differs from the parent variety only by the presence of the sucker-mouth and large twisted awn. The sucker-mouth may even be missing, and there is then no certain means of knowing whether or not the false type is present in any particular sample. It would seem impossible to draw the line anywhere, other than between the fully fledged false type, and the real wild oat. It is possible to obtain a series of awns graduating in size from the merest thread up to the large double and twisted awn of the wild oat. On the same plant, and even in the same head a great difference in the size of the awns may be found.

Plant Disease and Some Remedies.*

The damage done to the farm crops by the action of seed-borne parasitic diseases is only in part appreciated by the farming public. Until lately, if a crop failed it was attributed generally to weather conditions, soil depletion or to various other general causes, such as hot winds, etc. Lately it is being appreciated that these in a large way affect the health of the plant or crop by exaggerating the injury which infectious diseases are able to cause. Ordinarily there is in our wheat lands sufficient fertility to make a reasonable crop one year with another. Ordinarily on well drained ground in the regular cereal belt there is sufficient rainfall and moisture to produce a reasonable crop. Yet, often in the years in which all of the ordinary weather conditions seem most propitious, the crops may fall in certain localities to a minimum, even on the most fertile soils, because of the action of definite infectious diseases. In the case of stinking smut of wheat a small percentage in the crop results in grain of a rejected grade, and fifty per cent. loss in yield is not an uncommon result in the northern states. In some exaggerated cases as high as twenty to thirty per cent. of a fine crop of wheat may be destroyed by loose smut, and where treatment is not carried out, loose smut of oats seldom runs below ten per cent. of the crop and often as high as fifty per cent. In the case of millet and barley smuts, the loss is at times even greater. Again, ergot takes a regular, though small, percentage of wheat and rye, while the flax-wilt and canker often take the entire crop, regardless of weather or quality of soil. In the case of

*Extracts from a bulletin prepared by Prof. H. olby, North Dakota Agricultural College.

the smuts, it is remembered that the damage done to the crop is not alone measured by the heads lost or destroyed by smut, for in a smut attacked crop very many stools are attacked which do not show smutted heads but do produce shrivelled grain.

INDEFINITE FUNGI: There yet remains countless indefinite fungi which prey upon the standard cereal crops, fungi, the existence of which is known only to comparatively few botanists and by them only through mere scientific names, minute plants which ordinarily were not supposed to do much damage, yet, of late years, found by special investigations to be even more destructive to wheat and cereals than are either rust or smut. Each of these different kinds of diseases has its own method of attacking its special crop. Practically all of them are accumulative in their effects, gradually producing heavier diseases each year because of continuous methods of cropping to one particular kind of cereal. Those which attack by way of the soil, such as blight, fungi of flax, root-rot of wheat, gradually become more abundant each year with each successive crop. Those which are transmitted by way of the seed, unless checked by preventive treatments, become more and more abundant, carried over by each successive sowing of seed. Those which attack the seed internally in common with such as loose smut of wheat, canker diseases of flax, and of wheat (Colletotrichum) and the Fusarium diseases, wilt of flax and blight and scab of wheat, and many others, bring about material seed degeneration until the seed is not only greatly weakened but almost every plant is diseased.

COST OF SEED TREATMENT: So far as the smuts of cereals and wilts of flax are concerned, present known treatments are sufficient to allow the farmer to raise practically clean crops and the cost of treatment in any case, excepting only that of loose smut of wheat and barley, is now by a better knowledge of methods reduced to a minimum, and properly handled it does not exceed one-half a cent to one cent per acre.

METHODS OF TREATMENT: Many methods of treating for the prevention of smuts have been developed. Most of them that are now in use may be looked upon as reasonably successful. Furthermore, it is now a known fact that they are beneficial to crops treated because of the destruction of spores of many other fungi that have not usually been recognized as disease producers. The various proposed treatments named in order of their origin are as follows:

1. The copper sulphate method, commonly known as "blue stoning," is conducted in a number of ways. Different men advocate solutions, which vary much in strength. In the case of weak solutions the seed is allowed to remain in the solution a number of hours. In the case of strong solutions the seed is merely dipped or is dampened on the outside by a fine spray while the grain is being shovelled over. The latter method is commonly used in the Northwest and the strength commonly used is 1 lb. of copper sulphate to each 4 gallons of water. The solution is thrown upon the grain by a fine spray from a force pump, while the grain is raked or shovelled over, the shovelling and spraying being so worked together as to give the grain an even moistening without allowing it to soak up too much of the solution.

Another formula for the use of blue stone is 2 lbs. of powdered copper sulphate to each 50 gallons (U.S.) of water. Soak the grain for 12 hours, stirring the same occasionally. After removing the same immerse it a few minutes in lime water at the rate of 2 lbs. of quick lime to 20 gallons of water.

The author's experiments with copper sulphate found it to be more or less injurious to the seed grain, especially oats and barley. If properly done either one of these copper methods will prevent the occurrence of stinking smut of wheat, but they will be quite injurious to the yield of oats and barley, and if effective against stinking smut will also cut down the possible yield of wheat quite materially.

2. Potassium sulphide: This treatment was recommended by the Kansas Experiment Station for use on oats—Potassium sulphide, 1 lb. to each 24 gallons of water. Place the seed in a wooden vessel and pour the solution on until the seed is covered several inches deep. The grain should stand in the solution 24 hours, after which it must be spread out to dry. The author has found this treatment a successful preventive of oat smut, but a very disagreeable one to use and very unsatisfactory for the farmers of the Northwest who farm on an extensive plan, as the solution makes a bad stain, smells badly, and is of such nature as to cause the grain to dry slowly.

3. Hot water: This treatment was first recommended by J. L. Jensen, of Copenhagen, Denmark, 1887, for the prevention of loose smut of oats and barley. The standard method calls for immersing the seed in water at a temperature of 132 degrees F., 55½ degrees C., for fifteen minutes. This temperature is found to be just sufficient to allow the water to destroy the spores of smut inside of the husks or scales enclosing the oat grain, and yet not be injurious to the oats themselves. As usally recommended, the treatment consists of dipping the grain, either in gunny sacks, perforated pails, or in wire baskets, into kettles or tanks containing hot water. The grain should be swung on a crane or movable lever, so that it can be lowered into the water and raised with convenience. In one vessel the temperature is held at 110 degrees to 120 degrees F. The grain is dipped in this vessel once or twice to take off the chill. After draining slightly it is lowered into a second vessel containing water at a temperature of 132 degrees to 133 degrees F. twelve to fifteen minutes. It is then removed and cooled as rapidly as possible by shovelling over. I have found this treatment thoroughly effective against stinking smut of wheat and loose smut of oats, but consider it insufficient in its speed for the large farms of the Northwest where great bulks of seed must be treated each year in but a few days. It is a very satisfactory treatment for the seed of a small seed plot.

The following modification of this treatment will be advantageous if used on the large farms. Build a large wooden tank 4 ft. x 4 ft. x 14 ft. Run the threshing engine alongside of this and use the exhaust steam to heat the water. Large wire baskets swung on a crane can be used for dipping purposes and a number of baskets can be dipped at once. In this case the temperature should be held at 135 degrees to 140 degrees F. If the temperature is standing at 135 degrees after the grain has been immersed either wheat or oats can remain there for from five to eight minutes without injury. If the temperature is held at approximately 138 degrees F. the time should not exceed two minutes. Dump the grain and stir rapidly to cool.

4. Corrosive Sublimate: This treatment was developed by the author as a substitute for the copper sulphate method. It was found to be satisfactory for the prevention of stinking smut but not

Contiued on Page 83

I.

The youngster is the life of the farm. Every day he is out with his father, who laughingly calls him a "nuisance", but the boy thinks that a compliment and keeps on tagging close at father's heels or getting square in the way.

The little fellow hails passers-by with a friendly "Hello," and "Where are you going?" or, perhaps, "Goin' home?" and sometimes they stop and talk a while with the inquisitive little specimen of humanity, with his shock of tow and funny Brownie overalls. They take it all in good part. The autoists whiz by but not too fast to wave to "Little Son".

Of course mother frets a little at her "baby" being out of her sight so much, and would rather he would stay with her a part of the time—he is such good company. The little man runs into the house every once in a while to see if his mamma is there all right, and to warm his fingers by the range; or, if it be summer, to have a thistle picked out. Likely he wants a "piece"; meal-times are so far apart for him. Mother does not believe in "pieces" much, but usually can be persuaded to get her always hungry youngster an apple, or a cup of milk, or some bread and butter, to tide him over until dinner-time.

If he comes in muddy or covered with burrs, of course mother helps to make him comfortable before he is turned loose again. One day when he came in with wet feet, mamma was too busy to do anything but set him up in front of the open oven-door to dry. Patiently he stood it a little while, and then burst out: "Mamma, I'm not dryin', I'm a-cookin'!"

It is strenuous work for a child of three to follow his father about his work all day. Such meals as the boy stows away! Such red cheeks and bright eyes and firm, hard flesh! He grows so fast that his clothes do not wear out but get too small. Before five o'clock every afternoon he is leg-weary and sleepy—so sleepy that he can not possibly keep awake during his supper, but falls asleep in his little high chair. Father carries him tenderly up to his soft little bed. He rouses just enough, when mother undresses him and rubs his tired legs, to get half way through his little prayer, "Now I lay me down to sleep", before his big blue eyes are fast shut once more.

Nowhere else has a boy the chance for such perfect physical and good moral development as on the farm. There is scarcely any other occupation where a father can have the companionship of his children at his daily work. Our country needs more such boys growing up.

II.

There are many barn conveniences now offered on the market, but, in our opinion the overhead manure carrier is one of the most practical labor saving devices in the bunch. They are a companion to the manure spreader and equally valuable when it comes to saving time and labor. We pity the man who insists on still using a wheelbarrow to clean his barns or permits the manure to be piled against the buildings where it has been forked from open doors and windows. Such heaps are quite sure to suggest shiftless management on the part of the owner and at the same time soon become a nuisance about the buildings. There is really no excuse for their occupying a place where they are a continued hindrance to getting the stock in and out of the barns. We have seen instances where it was almost necessary to swim the smaller animals through a pool of mud caused by the banks of manure which kept the water from the roof so enclosed that it could not escape to lower levels in the barnyard.

The man who wheels manure from the barn in a barrow through deep snow and over rough cattle paths has been known to use language, in the event of accident to his load, that would not bear repeating in polite society. All these hardships and others may be overcome where an overhead manure carrier has been installed in the barn. Their cost is small when compared to the time and labor they will save during their life history which should continue, with proper care, for many years.

The best carriers are so adjusted that they run on iron cables suspended from the overhead floor joist. The cable should be continued to a substantially anchored post outside of the barn and so arranged that the loads may be dumped into the manure spreader and taken to the fields where no loss in fertility will occur from leaching, heating or exposure. The track or cable can be provided with switches so that the carrier can enter one or more doors in the barn. They are equally valuable for distributing grain, roots and silage from their containers to the feed boxes. The overhead carrier has many advantages over a truck that must be confined to a railway track on the floor, which occupies space that is always needed for other purposes.

There are several implement houses who offer these manure and feed carriers for sale. They are ready to hang when they leave the shop. Ask your local dealers in farm implements about these carriers. Possibly they have them in stock and so placed in

their saleroom that the workings can be clearly explained. Don't consider these labor saving devices as luxuries when they will pay their cost several times over every year. The hired man is one of the most expensive luxuries we can name just now and, at the same time, often not dependable. Substitute him with up-to-date farm implements.

In these days a farmer is not considered extravagant, or inclined to foolishly expend his money, if he supplies himself with such machinery as will enable him to save his own strength and accomplish his work in less time than he could do it by hand labor. If he secures the right kind of implements, uses them in the right way and takes proper care of them, he is adding to his profit every day.

III.

Farmers must buy and sell. It is neither possible nor desirable for them to produce everything required for their comfort and happiness; nor can they use all the products of their farms. Whether they wish to exchange the fruit of their labor for a money consideration, or barter for food and clothing, some standard of weights and measures is necessary.

No one can truthfully deny that there often is much dissatisfaction in marketing farm produce. This is especially true where the farmer allows the buyer to do all the weighing. A load of grain does not weigh up to expectations, and it is perfectly natural for the farmer, without having weighed the grain at home, to suspect the buyer of trickery. On the other hand, if the buyer wishes he can easily do some crooked work and the farmer be none the wiser.

Not all farmers are fair in their dealings with others; it is proverbial that a miller is a thief, but where the farmer has scales he can weigh every load of grain before taking it to market and prevent any mistakes, intentional or otherwise. A few mistakes would soon amount to the price of a pair of scales, and it is surprising how often the mistakes are in favor of the "other fellow."

For weighing the different farm commodities there are a variety of scales, from the spring balance, which will weigh a package of one-half to twenty-four pounds to the large wagon scales which will weigh a load of three to five tons. The kind of scales needed varies with the nature and amount of business done, but probably the most useful to the farmer, and the kind most frequently found on farms is the portable platform scale, suitable for weights varying from one-half to 1200 pounds.

After many years' use a pair of these scales of standard make are practically as good as new, perfectly reliable, and with ordinary care are still good for many years to come.

Of course such scales are not suitable for the weighing of large animals, and if much live stock is kept the advantage of having wagon scales is apparent, for not only live stock, but also grain may be weighed more easily and quickly than on the platform scales.

For household use the dairy scale weighing from one-half ounce to 250 pounds is very convenient and suitable for meat, groceries, dairy products, and poultry. Where neighbors buy from each other, as they do more or less, it is very inconvenient not to have a pair of scales handy.

While it is too much to say that a pair of scales on every farm would obviate all the differences between the buyer and the seller, there is no doubt that it would aid them in arriving at a more harmonious agreement.

Though there are some people who are entirely above suspicion, there are others who obviously have for their motto: "Do unto others as they would do unto you, and do it first," so that a person must be on the lookout.

Apparently the day is far off when every man will be honest and conscientious, and until that day a pair of scales on every farm would enable the honest tiller of the soil to show the "other fellow" that honesty is a necessary policy.

IV.

Not long ago one of the leading journals devoted to the tobacco interests asked the question "can retailers raise the price?" One of the problems now agitating agriculturists is, can they control the prices on their own product? Up to the present time no solution has yet been found, although many schemes have been originated and discussed. There is one thing the farmer can do—take advantage of the market. To do this he must know about the markets; know about what the world away from his immediate vicinity is doing in the way of producing. A number of years ago your correspondent was talking with a farmer who was very successful, laying by money each year, and asked him for the secret of his unvarying success. Enough of his reply for the present purpose can be given in a few words: "I try to learn what is to be wanted; how great the probable supply will be; thus I sometimes put acres in onions, other times acres in beans. When my neighbors turn to onions or beans I take up something else. Then, when my crop, no matter what it is, is ready for market and when the roads are good, so I can haul the very largest loads, I market, regardless of what the price is. I take my pay in cash, and I put the cash out at interest, thus I get the higher price my neighbor waits for. He pays me the higher price."

It is not necessary for a woman to go to a beauty specialist for ruddy lips and cheeks, if she will make a flower garden and give it her daily attention. The exercise is healthful.

THE FUNNY WORLD

The matter on this page lays no claim whatever to originality. The one idea is to amuse, to provoke a smile. If it fulfills this mission we shall feel amply repaid for the time and labor expended in its preparation. Have you read or heard something that has made you laugh? Has it chased dull care away for a time? Then pass it along for publication in our Funny World. Such contributions will be greatly appreciated.

An Atlanta merchant had frequent occasion to rebuke Ike, his darkey porter, for his tardiness in reporting in the morning. Ike was always ready with an excuse.

"You're two hours late," exclaimed his employer one morning. "This sort of thing must stop, otherwise I'm going to fire you. Understand now?"

"Deed, Mistah Edward," replied Ike, "it was dis er way; it wa'nt mah fault dis er time, honest. I was kicked by a mule—yes, sir, I was, honest. Kicked by a mule."

"Well, even if that was so it wouldn't delay you two hours. You'll have to think of a better excuse than that this time, that's sure."

Ike looked worried but continued with his excuse. "Mistah Edward," he said solemnly, "it might have been all right if dat air mule kicked me in dis direction, but he didn't do dat. He done kicked me de other way."

A boy had been up for examination in scripture, but had failed utterly, and the relations between him and the examiner were somewhat strained.

"Is there any text in the Bible you can quote, sir?" asked the examiner, with a decidedly sarcastic twist on his words.

The boy pondered awhile and finally repeated: "And Judas went out and hanged himself."

"Is there any other verse you know?"

"Yes; 'Go thou and do likewise.'"

An Irishman, who wasn't much of a hunter, went out to hunt one day, and the first thing he saw to shoot at was a blue jay sitting saucily on the top of a fence. He blazed away at the bird, and then walked over to pick it up. What he happened to find there was a dead frog, which he raised carefully at arm's length, looking at it with a puzzled air. Finally he remarked:

"Well, begabs, but ye was a devil of a foine lookin' bird, befur Oi blew ther fithers off o' yerse."

The American opinion of coffee as understood in the English home is not high, and how the coffee of the English lodging-houses is esteemed may be understood from the following traveler's tale:

It was his first morning in London "apartments," and his landlady came up with the breakfast. As she set down his coffee-cup she opened a slight conversation.

"It looks like rain," she said.

"It does," agreed the American, "and it doesn't even smell unlike it."

Patrick, lately over, was working in the yards of a railroad. One day he happened to be in the yard office when the force was out. The telephone rang vigorously several times and he at last decided it ought to be answered. He walked over to the instrument, took down the receiver, and put his mouth to the transmitter, just as he had seen others do.

"Hillo!" he called.

"Hello!" answered the voice at the other end of the line. "Is this eight-six-one-five-nine?"

"Aw, g'wan! Phat d' ye tink Oi am? A box car?"

Absent-minded Professor Brumbell walked up to his own door one evening and rang the bell. The door was opened and he said:

"Good evening, Mrs. Brumbell. Is the professor at home?"

"No," replied the vivacious young wife, "he went down town about half an hour ago but I expect him back at any minute. Won't you come in and wait?"

"No, thank you," replied the professor. "I'll call again a little later."

Then she laughed and the spell was broken.

A Sunday school teacher was telling her class of small boys about the sin of lying. She told them if they told lies they would never go to heaven, when one of the young hopefuls asked her if she had never told any. She said:

"Why, no, of course not."

He asked her if she expected to go to heaven, and she answered that she did. Then he exclaimed, "Teacher, won't you be awful lonesome up there, just you and George Washington?"

An old lady on her first railroad trip remarked the bell-cord overhead, and, turning to a boy, she asked:

"Sonny, what's that for?"

"That, marm," he said, with a mischievous twinkle in his eyes, "is to ring the bell when you want anything to eat."

Shortly afterward the old lady reached her umbrella up to the cord and gave it a vigorous pull. The whistle sounded, the brakes were put on, the train began to slacken its speed, windows were thrown up, and confusion reigned among the passengers. The old lady sat calmly through it all, little dreaming that she was the cause of the excitement.

Presently the conductor came rushing through the train. "Who pulled that cord?" he demaided.

"I did," replied the old lady meekly.

"Well, what do you want?" snapped the official.

"Well," said the old lady meditatively, "you may bring me some ham sandwiches and a cup of tea, if you will."

Mary had been greatly interested in watching the men in her grandfather's orchard putting bands around the fruit trees, and asked a great many questions.

Some weeks later, when in the city with her mother, she noticed a gentleman with a mourning band around his sleeve.

"Mamma," she asked, "what's to keep them from crawling up his other arm?"

A bunch of old deep-sea fishermen in the cabin of a smack had been puzzling for half an hour over the mental problem: "If a herring and a half costs a penny and a half, how many herrings can you buy for a shilling and a half?"

"What did you say the mackerel and a half cost?" asked one of the fishermen

"I didn't say mackerel; I said herring!" exclaimed the skipper.

"Oh, that's different," said the sailor man. "I've been figuring on mackerel."

A reputable citizen had left four umbrellas to be repaired. At noon he had luncheon in a restaurant, and as he was departing he absent-mindedly started to take an umbrella from a hook near his hat.

"That's mine, sir," said a woman at the next table.

He apologized and went out. When he was going home in a street car with his four repaired umbrellas, the woman he had seen in the restaurant got in. She glanced from him to his umbrellas and said:

"I see you had a good day."

The old physician is an enthusiastic angler in every sense of the term. While on his way home from a fishing trip he received an emergency call. The proud newly-made father was impatient to have the child weighed, but couldn't find the steelyards; so the physician had to use the pocket scales with which he weighed his fish.

"Great Scott, Doctor!" exclaimed the father, as he saw the pointer go up, "Thirty-seven and a half pounds!"

There was a small job of diving to be done and, as the divers were all absent, an Irishman who had just been engaged to work the air pump volunteered to go down. He was told how to signal when he wished to be brought to the surface. He had been down barely long enough to begin work when he signaled that he wanted to come up. As soon as he was on the boat, he motioned to have the helmet taken off.

"Begob," he said, when his head was free, "I'll not wor-r-k where I can't spit on me hands."

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THE INDIANA MANUFACTURING COMPANY

Indianapolis, Indiana

Fairs in Saskatchewan.

CIRCUIT A.

Yorkton	July 5, 6 7
Vonda	July 12
Bladworth	July 26
Unity	July 27
Langham	July 29
Melfort	Aug. 12, 13
Prince Albert	Aug. 16, 17, 18

CIRCUIT B.

Churchbridge	July 19
Foam Lake	July 20
Saltcoats	July 20, 21
Wynyard	July 26
Govan	July 27
Strassburg	July 28, 29
Humboldt	Aug. 2 3
Wadena	Aug. 4 5
Quill Lake	Aug. 6
Lloydminster	Aug. 9
Lashburn	Aug 11

CIRCUIT C.

Fort Qu'Appelle	July 25
Swift Current	July 27, 28
Mortlach	July 29
Francis	Aug. 2
Stoughton	Aug. 3
Creelman	Aug. 5
Moosomin	Aug. 9, 10

CIRCUIT D.

Regina	Aug 2, 3, 4, 5 6
Carlyle	Aug. 9
Weyburn	Aug. 10, 11
Milestone	Aug. 12
Craik	Aug. 16
Lumsden	Aug. 17

CIRCUIT E.

Windthorst	Aug. 2
Fairmede	Aug. 3
Abenerthy	Aug. 5
Nokomis	Aug. 9, 10
Lipton	Aug. 11
Dubue	Aug. 12
Lanigan	Aug. 16, 17

CIRCUIT F.

Gainsboro	Aug. 2
Carnduff	Aug. 3
Oxbow	Aug. 4
Alameda	Aug. 5
Moose Jaw	Aug. 10, 11, 12

CIRCUIT G.

Brownlee	Aug. 2
Hanley	Aug. 3 4
Davidson	Aug. 5
Saskatoon	Aug. 9, 10, 11, 12
Rosthern	Aug. 15, 16

CIRCUIT H.

Qu'Appelle	Aug. 9, 10
Arcola	Aug. 11
Sintaluta	Aug. 12
Grenfell	Aug. 16, 17
Whitewood	Aug. 18
Stockholm	Aug. 19

CIRCUIT I.

Kennedy	Aug. 9
Wolseley	Aug. 10
Indian Head	Aug. 11
Broadview	Aug. 12, 13
Wapella	Aug. 16

CIRCUIT J.

Carlton	Sept. 6
Tisdale	Sept. 13
Kinistino	Sept. 15
Duck Lake	Sept. 16
Paynton	Sept. 20
Maymont	Sept. 21
Radisson	Sept. 22
Asquith	Sept. 23
Togo	Sept. 27
Canora	Sept. 28
Watson	Sept. 29
Maple Creek	Sept. 21, 22
North Battleford	Oct. 11, 12
Battleford	

There are many ways in which a stone boat or a cheap one-horse sleigh can be used to advantage about the farm buildings while doing the chores. It is often necessary to move grain or ground feed from one place to another while feeding the stock. A strong man may carry this on his back, which in many instances, he would prefer to do rather than hitch an old horse to a stone boat, but the old men and the boys can do such work much easier with the horse. We don't have much time or sympathy for the men, regardless of their strength, who are willing to make beasts or burden of themselves and others when there are horses on the farm in need of exercise. We often see men lugging water by hand three times a day for stock, where an old horse and a stone boat would do the work in a fraction of the time, and thus save shoe leather if it did no more valuable service for the man.

In many instances the old horse and a narrow stone boat or sleigh can be used to draw manure from the barns into the yard or fields, and while on the return trip bring in loads of shock corn or straw. This is a more sensible undertaking than that of doing such work by main strength while the horses are kicking their shoes off and the barn to pieces for exercise.

There is something wrong with the upper story of a man who will walk to town or compel his wife and children to stay away from church and Sunday school on the Sabbath, because he doesn't want his horses to stand outside in the cold. Perhaps his barn is so dark and filthy that his horses are losing their eyesight and health because of their need of the light and fresh air. We have known instances where the horses on the farm have been so coddled and saved from work or exercise during the winter months that they were worthless when seeding time with its strenuous work for men and beast came on. Thousands of horses die every winter because of over-feeding and the need of exercise or work. We admire the man who is merciful to his beasts, but there is such a thing as being too good to them.

Get busy and make a stone boat or cheap one-horse sleigh to use whenever and wherever they will save manual wear and tear. The exercise of a little forethought in these matters will suggest many ways in which our beasts of burden can save their master for years of usefulness and comfortable living. The man who squanders his strength and health is a spendthrift indeed.

The U. S. five-cent pieces, of course, are merely tokens, deriving their purchasing power from the fiat of the Treasury. The metal blanks for them cost only about fourteen cents a hundred. When the expense of stamping the designs upon them is added, they come to something like $3510 per million. that is to say, for this amount the Government produces $50,000 worth of "nickels," making a clear profit of $46,490 on the transaction.

The best fighters are sometimes the best peace-makers.

A light head beats a heavy heart.

The path of duty and the road to happiness run parallel.

The Seal of Alberta

This office is in receipt of a very nice booklet which Mr. Earnest S. Wooley, Advertising Manager of the Calgary Milling Company, has gotten out for that concern.

It describes in detail the workings of a modern flour mill, illustating the same with suitable cuts.

A great deal of valuable information is contained in this little booklet and the same is not only a credit to Mr. Wooley, but to the Calgary Milling Company.

A Short Course of Traction Engineering

Elsewhere in this issue will be found the advertisement of the Manitoba Agricultural College announcing a short course in steam and gas engineering, the same to be held at the Agricultural College, Winnipeg, from June 14th to July 1st.

These short courses which the Manitoba Agricultural College put on furnish an excellent opportunity to the farmers of Western Canada who are desirous of becoming thoroughly familiar with the principles of modern farm power to brush up on the subject.

Only a Butter Tub, But—

Elsewhere in this issue will be found the announcement that should prove of interest to every farmer who has occasion to use a butter tub. It seems that according to an established custom, that the farmer is docked a certain amount off every tub of butter that he takes to town, this docking running six, eight and ten lbs. for 20, 30 and 50 pound tubs respectively.

This dockage has been brought about through the fact that butter tubs are scalded out and in the scalding process they absorb a certain amount of water. It has been found that the tubs plus the water that they absorb makes the above amount of dockage necessary.

There has, however, recently appeared upon the market a poplar butter tub which is parafined on the inside in order that the butter will not absorb the flavor of the wood. These poplar tubs cannot be scalded out as the hot water will melt the paraffine. Consequently, there is no opportunity offered for them to absorb a certain amount of water.

When the farmer buys a poplar butter tub, fills it with butter and takes it to town he is docked the same on the poplar tub that he is on the spruce tub and in consequence is docked more than he should be. The result is that the farmer who uses the poplar butter tub is paying for a large portion of his dockage with good high-priced butter. On a nest of tubs of say 20, 30 and 50 lbs. this amount of butter will be about 7 lbs. and we will say at 15c. a lb. the farmer is losing $1.05 which is really the original cost of the spruce tubs.

A great many of the farmers who have been using poplar tubs as against spruce tubs will wonder why their butter does not weigh up and the above comes as a solution.

There is another thing in connection with this poplar butter tub and that is, on account of its not being practicable to scald it, it is not so thoroughly cleansed as is the spruce tub, and cannot be rid of the germs that may have found their way there as well as can the spruce tub Just ask your merchant about this butter tub business the next time you go to town and see what he knows about it. Then purchase two butter tubs of the same capacity, one made of spruce and one made of poplar. Weigh the butter that goes into each tub carefully before you put it in and then compare the weights that you get from your merchant and you will find that the above comes very close to the fact. What with butter ranging around 30 and 35 cents a pound the loss of seven pounds in a nest of tubs makes a nice hole through which profits can leak.

The Capacity of Tile Drains

By E. W. Hamilton, Iowa State College

Tile drainage in Western Canada is a new thing but the time will come when it will be carefully looked into.—Ed.

AT the inception of underground drainage, the determination of tile sizes vary, largely a matter of conjecture. Little was known of the effects of changes of grades and diameters by those engaged in laying out drainage systems. In general, the Drainage Engineer was a farmer or tiller of but little more than ordinary experience. As a rule he had little idea of the quantity of water he was endeavoring to carry off or the ability of the tile he recommended to do it. He determined tile sizes solely by comparing the conditions in hand with those with which he had had to deal. If his experience was long, his services were valuable.

Gradually man of larger experience came to formulate rules to guide them in the selection of tile sizes. As an example, they worked on the assumption that a 10 inch or 12 inch will drain a quarter section and they worked from this, while holding only very vague conceptions of the effects of changes of diameters and neglecting grades almost entirely. Closely following this loose type of drainage engineering, some strong men have sought to place the draining of agricultural lands on a truly engineering basis, and as a result have given to the profession standards and formulae without which the present development of land draining would have been almost impossible. The greatest of these men is C. G. Elliott, the present Chief of Drainage Investigations, U. S. Dept. of Agriculture. He has given to the public all the capacity and run off formulae for tile drains and run off standards for open ditches. He has brought out principles governing the depth and spacing of drains, together with the general practice of land drainage. In short, he has done much to put the draining of agricultural lands on an engineering basis.

The formulae proposed were of necessity simple rather than accurate. They were developed to be used in a large measure by men unable to handle more formidable formulae. In this way they have been of great service. But while this is true, many drainage engineers have abandoned the simple and approximate formulae for capacity of open ditches for the more complex and more accurate Kutter's formula. It is the purpose of this paper to investigate as far as may be possible without the aid of experimental data, the accuracy of the formula

$$Q=48A\sqrt{\frac{df}{1+54d}}$$

proposed for the discharge in cu. ft. per second for tile drains. Also to call attention to the formula believed by the author to be sufficiently more accurate to warrant its use in preference.

Before beginning the more detailed comparison, a general view of the formula and consideration of the desirability of increased accuracy will be helpful. In the first place, this formula without change was taken from cast iron water pipe computations, but, like all the earlier formulae for flow of water in pipes, it has a constant or practically constant co-efficient that does not change with the roughness or condition of the pipe or relation of the area of cross section to the wetted surface, or hydraulic radius. In engineering handbooks this formula, together with others of like construction, are tested as obsolete formulae and newer ones covering more nearly the conditions mentioned are recommended. It would seem that these facts concerning the origin of this formula and its disuse for the purpose first proposed would warrant a study of its merit before adopting it for use in problems differing as widely as the capacities of drain pipes and cast iron water pipes.

Taking the same formula and using a varying co-efficient in place of 48 as is given in engineering handbooks as good practice, for cast iron water pipes, the following results are obtained.

Note: These varying co-efficients give results closely approximating those by Kutter's formula with N=.012.

First taking 36 inch to; easre, pvomg ¼ acre inch by both formulae and computing the amount removed by he formula discharge.

$$Q=48A\sqrt{\frac{df}{1+54d}}$$

36 inch removes .25 acre inch
24 inch removes .23 acre inch
18 inch removes .21 acre inch
12 inch removes .19 acre inch
8 inch removes .17 acre inch
6 inch removes .16 acre inch
4 inch removes .14 acre inch

Note: The removed in case of small tile is little more than one eighth inch for the small area as against ¼ inch for the largest tile and the large area.

Taking the same data and making percentages the basis of comparison with 36 inch removing 100% by both formulae and calculating the per cent. removed by the formula in question, the following table is secured:

36 inch removes 100 per cent.
24 inch removes 92 per cent.
18 inch removes 84 per cent.
12 inch removes 76 per cent.
8 inch removes 68 per cent.
6 inch removes 64 per cent.
4 inch removes 56 per cent.

Taking Kutter's formula as the basis and computing the necessary co-efficients of roughness for the same sizes of tile on .1% grade to give same capacity as those obtained by the formula in

question the following table is obtained:

36 inch tile	N= .015
24 inch tile	N=.0145
18 inch tile	N=.0135
12 inch tile	N= .012
8 inch tile	N= .011
6 inch tile	N=.0105
4 inch tile	N=.0095

This variation of co-efficients caused by changing diameters only is greater than that recommended for the smoothest of cast iron pipes and ordinary rough or second class brick work In the first three tables, the variation of results obtained by this formula and formulae, recognizd as being the most reliable, it is not as large as though a rougher pipe like drain tiles were assumed, for the rougher the pipe the more rapidly the change of capacity with change of diameter.

Viewing these comparisons, the question arises as to whether, considering the inaccuracy of the determination of the quantity of water to be removed in any case, is it consistent to try to secure more accurate capacity formulae? The figures given seem to clearly indicate a relatively large discrepancy in the formula in question, of perhaps fifty per cent. The relative error in the run off standard could hardly exceed this. It is not at all impossible that the ordinary errors in the latter are at least no greater than in the former and, if compensating, considering the sub-mains, might be negligible, but the error in capacity rating is constant and is therefore a positive addition or subtraction from the error in run off standard as they are like or unlike in sign. It is easily possible that in a given case the quantity of water to be removed be estimated as two thirds that which should be actually removed and that the pipe chosen be capable of carrying two-thirds of the computed discharge, resulting in the removal of only four-ninths or less than half the required quantity. Obviously, the final error is, in general, lessened when the error in capacity is reduced below that in run off standard.

Then again there is another important reason why the error in capacity formulae should be reduced materially below that in run off standard. The run off standard is closely related to capacity formulae. The run off standard is determined not empirically but chiefly by the observed performance of diameters. The run off standard soon adjusts itself to the capacity formula. If the latter be too small the run off standard is increased to cover the deficiency. But, if the discrepancy in capacity formula vary with each size of tile used, there can be nothing but confusion in the determination of run off standard. In proposing the use of another formula to reduce these undesirable features of the one in question, the author realizes that the proposed formula is not perfect; that, in fact, all such formulae are subject to relatively large errors as compared with many other formulae. He realizes that the flow of liquids in pipes has not as yet yielded completely to a mathematical solution. However, he does maintain that Chezy's formula C RS with Kutter's formulae for the determination of the value of C,

$$\frac{1.811}{N} + 41.65 + \frac{.00281}{S}$$

$$1 + \frac{N}{\sqrt{R}}\left[41.65 + \frac{.00281}{S}\right]$$

overcomes in a large measure the objections lodged against the other formula, namely, error in capacity and a varying error co-efficient incapable of correction by distortion of run off standard.

In the above formula the hydraulic radius, R=¼ diameter of pipe, and the sine of slope, S=grade per cent. divided by 100, are readily determined. The co-efficient of roughness, N, has to be determined for each class of work. The probable value of N would logically seem to lie between .013, that found applicable to smooth brick work and sewer pipe well laid, and .015, that for ordinary rough or second class work. The latter is used for brick sewers. Very possibly different kinds of tile will need different co-efficients of roughness if more than ordinary accuracy is required. The Iowa Engineering Experiment Station under the directorship of Dean Marston is at present at work on this problem and expects to be able to furnish exact data in the near future. The following tables give the value of C computed by the above formula with a coefficient of roughness, N=.014 and a .1% grade. This co-efficient is chosen because from the above values of N the one assumed would, in the author's opinion, seem to meet the conditions met with in tile of good quality, well laid. Uneven tile or tile carelessly laid would probably require co-efficiency of roughness of .015. To change the value of C given to approximately agree with those which would be obtained with N=.015, deduct 6% from the value of C given. To corect for grades widely different, correct as follows: near .05% subtract one, for grades at and above .5% add one.

Value of C to be used in formula discharge A in cu. ft. per second=area of cross section x C RS, in which R=Hydraulic radius or ¼ diameter of pipe and S=sine of slope or grade per cent. divided by 100. N=.014 Grade=.1%.

Size of tile.	Value of C	Size of tile.	Value of C
4 inch	54	15 inch	82
5 inch	59	16 inch	84
6 inch	63	18 inch	86
7 inch	66	20 inch	88
8 inch	69	22 inch	90
9 inch	72	24 inch	92
10 inch	74	28 inch	94
12 inch	77	30 inch	95
14 inch	80	36 inch	96

Note: To convert above discharge to acres drained by ¼-inch standard, divide by 0.105.

Don't Forget that Renewal

With our big Guessing Contest it may mean much to you.

The Bolt That Parted

By STEPHEN L. VINCENT

Harry McFarlane was driving homeward on the winding white road that led from Hillsboro to his home at Meadow Valley. Behind him in the light wagon were piled a number of bags of ground feed which had been the object of his trip to town. He had started at nine o'clock in the morning; it was now five in the afternoon. The horses which he drove, a pair of fine grays, were covered with a lather of foam as if they had been running. They champed their bits nervously and seemed harassed and anxious. The track which they left behind them was a strangely irregular one. It went perilously near to the edge of bridges, it crossed the road from side to side, and was now in the beaten track and now in the ditch beside it.

There was something very irregular, too, about McFarlane himself, handsome and debonair young fellow that he usually was. He sat in a slouching attitude and lurched unsteadily from one side of the seat to the other as the wagon jolted over ruts and stones. His hat was mashed rakishly upon one side of his head, his hair was rumpled and his face was red. He jerked the reins and swore in a thick voice at the horses.

"Yuh blamed fool, Nell, cantchuh keep f'm go'n over evr' stone in the road?"

He pulled savagely at the left rein and the horses swerved sharply in that direction. The road was rather steeply graded here; one wheel went off the bank and McFarlane, pitching heavily that way, rolled off the wagon into the ditch. The team returned to the centre of the road and stood still. McFarlane slowly picked himself out of the mud and water, climbed with difficulty back into his seat and started his horses off at a rattling pace down the road. A little while after he drew up beside a low, barnlike building, standing close by the roadside. This was the Meadow Valley Creamery. A hammer, briskly and energetically wielded, was making a lively din inside the building.

"Hey, Herb! Herbie!" called McFarlane. The hammering stopped.

"Hello, Harry," answered a cheerful voice, and presently the owner of it, a pleasant, open faced young man, appeared at the door, hammer in hand.

"Did you bring me those two butter tubs, Harry?" he asked.

McFarlane cast an astonished look back over his load.

"I say, Herb!" he exclaimed, "I mus' a leffem both in Hillsbo'ro, —else they're on the road somewhere. Tumbled off muhself shicks timshz, Herb. Say, come on home with me, will yuh?"

But Herb's face had darkened as he listened to the speech and surveyed McFarlane and the jaded team.

"Will you, Herb?"

"No," answered the creamery man, shortly, "I'm busy."

"Oh, come on," he pleaded. "Don't work so hard, Herb; mus' get some fun out o' life. Wantcher t'helf me do the chores."

"Go on home,—you!" roared Herbert Allen. "I won't ride with you!"

"Oh, I say, Herb! Don't get mad. S'pose I got t'go alone then, f'yuh won't go with me."

He turned his horses about in the creamery yard and narrowly escaped upsetting the wagon. Allen watched him grimly, without offering to assist. His face was set in hard lines of disgust and anger. When the team disappeared he went back to his work, punctuating his thoughts with vicious hammering at the butter cases he was making.

"He ought to have his head punched," he was saying to himself. "He might have kept decent while Peg was here, anyway."

"Peg" was Herbert Allen's sister, Margaret, who had come from their home in another state to spend a week at McFarlane's, where Herbert boarded.

"I suppose I might have gone along with him. It would have made it easier for his mother and Charlie. They will have to do all the chores. He will go to sleep in the barn as soon as he gets home. Oh, plague take him! I've pulled him out of saloons and brought him home time and again for his mother's sake, and now if he is going to begin this business again he can just go his own gait. I'm not a nurse for any drunken puppy."

A couple of months before this, Harry McFarlane, whose manhood was slipping away from him in the clutch of the alcohol habit, had made an effort to brace himself against his enemy. He had gone before a justice of the peace in Meadow Valley and taken an oath not to touch a drop of liquor again as long as he lived. More than once Allen had suspected him of having broken his promise, but this was the first time since the taking of the pledge that Harry had come home, as in the old days, beastly drunk.

Over at the McFarlane home Margaret Allen and Mrs. McFarlane had been spending the afternoon together. Charlie, the sixteen-year-old boy, was plowing in the field and Hetty, the one daughter of the family, had gone to a neighbor's to help in the preparations for a wedding which hey were to attend. Margaret sat with a book at one of the dining room windows. She was tired of reading and looked out over the wide, flat, darkening fields, to the western horizon, where the low fires of an autumn sunset touched the lovely landscape into sombre beauty. It was a picture that pleased Margaret and so did the room in

which she sat with its cheerful "Franklin," its gray striped wall-paper, its freshly curtained half windows, with a bird cage hung in each, and its worn and shabby but very comfortable furniture. But more than in the room or landscape Margaret was interested in the quiet, elderly woman who came and went about her household duties with gentle, tireless activity. Mrs. McFarlane was a Canadian Scotch woman, dark skinned, dark eyed, with a low voice and a quiet manner. Her face was lined by sorrow and lit by kindness and had a beauty of its own that was akin to that of the sombre autumn landscape outside the window.

Margaret had found her way somewhat difficult with Mrs. McFarlane and Hetty. The lines of her own life had fallen in pleasant places. She was a student in the college of her own town and because of this the two lonely women stood somewhat in awe of her. Hetty surveyed the simple but dainty belongings of her guest with a look that made Margaret wish she had brought plainer things. It was to please Herbert that she had chosen her prettiest gowns.

At times during the afternoon Mrs. McFarlane had paused beside Margaret for a few moment's chat. It was usually of Herbert that they talked.

"He is such a good boy," Mrs. McFarlane said, "so helpful and cheery about the house. He really does seem like one of our own family to us."

Margaret smiled brightly.

"I'm very glad," she said, "that Herbert has such a pleasant home-like place to live in."

"Oh, Miss Allen," sighed the older woman, "our home is not what it used to be when the head of the house was alive. We can't have things to do with like we did then. My husband was so good to me." The tears broke through her voice as she spoke.

"Did you find it hard to manage without him?" asked Margaret gently.

"Hard! Oh, Miss Allen, you can't think how hard it was. I never was used to managing anything. I never had a thing to think about except my housework. My husband attended to everything and when he died we were just left like sheep without a shepherd. There's nobody ever will know how hard it was."

She was crying softly now and presently rose and left the room. And it was of this that Margaret was thinking as evening drew on and she sat looking out of the window.

Presently the front door opened and Miss O'Rourke, the district school teacher who also boarded at McFarlane's, came in with her lunch basket and an armful of books. Miss O'Rourke was a pretty girl. Her hair was piled high in a fluffy mass over her face; she wore glasses and had a pleasant low voice with broad Irish cadence. Half an hour later Herbert Allen came in and found the two girls sitting together over their embroidery in the now lighted room.

"Well, this looks comfortable," he exclaimed, sitting down at the table and picking up a magazine. "Was it a long afternoon, Sis?"

"Oh, no," answered Margaret, "Mrs. McFarlane and I were picking apples and then I found your 'Sherlock Holmes.'"

"Well, you were entertained then," grinned Herbert, and after a moment he asked, "Where is Harry?"

"He's not home yet," answered Margaret.

"Not home!"

"He drove to Hillsboro this morning, you know."

Herbert's eyes left his sister's face and searched Miss O'Rourke's.

"He is here," said the latter quietly. "I saw him out in the yard."

These two were familiar with the family tragedy. Margaret caught the swift look which passed between them and then she too understood.

Mrs. McFarlane was preparing the table for supper, passing from kitchen to dining-room, and carefully closing the door between the two rooms each time that she went through. Margaret suddenly noticed how her hands trembled, how flurried and anxious were her movements, and how pitifully strained was the smile with which she glanced now and then in their direction.

Hetty came in, flushed and laughing, and gaily recounted her afternoon's work. She hung up her coat and hat and went out into the kitchen to help with the supper. When she appeared again it was to move silently about with downcast eyes and trembling lips. Once as Mrs. McFarlane went out of the room with a tray of cups, the sound of a maudlin voice was cut off by a sharp rattle of the dishes, which she nearly dropped in her haste to close the door.

Herbert rose and followed her. Behind the kitchen stove sat the boy, Charlie, sobbing like a child with impotent rage.

"Oh, Herb, help me!" he cried. "That devil's been choking me."

Harry stood rocking tipsily in the shed door with a drunken leer upon his face.

"Herbert, Herbert, what shall I do?" moaned Mrs. McFarlane, with tears streaming down her face.

Herbert turned about. Let's go out doors, Harry," he said. Once outside he burst out angrily:

"Oh, you miserable, drunken puppy! What do you want to show up like this for? Why didn't you drown yourself back there in the river?"

"I'd like to know what business 'tis of yours?" blustered Harry. "I'd like to know what right you think you have to come around here interferin'?"

His voice was very loud and Herbert realized the folly of quarreling with a drunken man.

"You just keep quiet and make yourself scarce, that's all," he said, and turned back to the house, knowing that for the time, at least, he would be obeyed.

"Put the lamp on the organ, Hetty; maybe Miss Allen will want to play," said Mrs. McFarlane after supper and Margaret, who felt her presence a pain to these two sensitive women, was glad of this chance to efface herself. The organ stood in a large alcove off the dining room and raised from it by a step. Miss O'Rourke brought her sewing into the alcove and Herbert came, too, and tuned up his violin and for the next hour or so they played and sang together A door opened from the alcove into the hall and they all felt relieved when, through a crack under the door, they saw a light passing through the hallway and knew from the voices and steps going up the stairs that Harry was safely off to bed. They gathered in a corner after that. Hetty came and sat on the step of the alcove and they drew her quickly into their talk. At first she watched Margaret furtively, with uneasy, inquiring glances, but seeing no trace of consciousness of anything unusual in the atmosphere, the tense lines in the girl's face relaxed at length, under the spell of the warm kindliness in Margaret's voice and manner. Presently Mrs. McFarlane came and she, too, was in a manner quieted and relieved to see them all quietly cheerful together and to listen to their talk.

Outside the alcove in a shadowy corner of the dining room sat Charlie, his chair tipped against a window casement and his body shrunken in an attitude of extreme weariness and dejection. Margaret was telling stor-

ies of her college life, the jokes in classroom, the pranks and midnight spreads, the strenuous work and strenuous play that went side by side, the students who worked their way through from beginning to end and still got the best of everything worth having, and the boy's eyes, as he listened, were glowing with a strange fire of wistfulness and pain. He had been passionately fond of his books—had Charlie. He had dreamed of making a place for himself in the world outside of Meadow Valley. Ever since Margaret came, echoes of this outside world had been beating against his heart, making it hot and restless. There were places where things were doing but he was not in them. There were people whose lives were for living—courageous, profitable, happy living, but he was not one of these. To be slaving for nothing on this old farm, to be cheated and shamed by a drunken brother, that was what life held for him.

Early in the afternoon of the following day Hetty, Margaret, Herbert and Charlie got into the old family surrey and drove away to the wedding at a neighboring farmhouse. They found a long row of carriages ranged outside the fence, and in the house were assembled a goodly company of country people, stiffly embarrassed, constrained and silent Hetty squeezed Margaret into a corner where she would be sure to see the ceremony and they waited. The arrival of the minister caused a little flutter of excitement He disappeared up the hall stairs, and then more waiting and a tenser silence.

At length, the girl who sat at the little cottage organ, closely packed round with people, was given the signal to begin playing the wedding march. She had been practicing for weeks and was desperately nervous. She pressed her fingers to the keys but they gave forth no sound. She pumped harder and faster at the bellows, and the only result was a prolonged and mournful wheeze. It came out later that a vase of flowers had been upset on the organ and the water spilled into the bellows. The girl's hands dropped at her side. Her face was very red and the house very still.

The silence was broken by a shrill voice:

"Nora Powers, why don't you play? They're all ready and waiting!"

It was the bride's sister calling over the banister.

"I can't play," wailed the girl. "The organ is broke."

"The organ is broke!" echoed a dozen voices in subdued consternation.

The bride's sister faced the crisis.

"Well," she declared, after a moment's silence. "I don't see but what they will have to come down without music."

And they came, the minister leading the way. The bride wore a heavy gown and the couple were red-faced and awkward, as they took their places with nervous jerks under the arch of evergreen and scarlet creeper.

But the grave young minister was truly a man of God, and a change came over the spirit of it all when his clear voice, with its earnest and beautiful intonation, was raised in the hushed assembly. Before the ceremony was finished, the stuffy little parlor, with its rag carpet and simple ornaments, had the atmosphere of a holy temple, the faces of the spectators were softened with reverence and their hearts very warm and kindly toward these two young people whom God had given into each other's keeping.

When the kissing and the handshaking were over and the tableful of presents duly inspected and admired, the guests went out of doors and scattered about in groups in the shady orchard that surrounded the house. Hetty had to slip away to help with the wedding-dinner. An empty bay in the big barn was to serve as a dining room and had been trimmed with evergreens and scarlet vines. Margaret had already met a number of the Meadow Valley people. Herbert was a favorite among them and they were disposed to be very friendly to his sister; and so the afternoon passed pleasantly. It troubled her, however, that so many people asked why Harry McFarlane was not there, if he were not coming and if he were ill; but she turned these inquiries as well as she could; she had not seen Harry at all that day.

But she did see him later in the afternoon as she was passing through the barn with her brother and Nora Powers. The girls who had waited upon the tables were themselves being served and Harry with them sitting beside his sister Hetty. A bright look came over Nora Powers' face when she saw him.

"Hello, Harry!" she exclaimed. He turned his head, smiling to answer her, but seeing Margaret beside Nora turned quickly back again.

The next day was the last of Margaret's visit. In the afternoon Herbert was to drive her to the station at Hillsboro. Soon after breakfast she walked over to the creamery and found her brother, with sleeves rolled up to his elbows, busied about the vats. The noise of the machinery made conversation impossible, and she went over to Herbert's desk. It was time for the monthly dividends and she spent the next half hour adding up columns of figures.

Presently Herbert reached a point in his work where the rolling wheels were no longer necessary, and he slipped off the belt that kept them in motion.

"Have you seen Harry to-day?" he asked in the silence that followed.

"No," answered Margaret. "I heard him talking to Miss O'Rourke in the dining room this morning, as I was coming downstairs, but he was gone before I opened the door."

Herbert gave a vicious kick to a pail that came in his way.

"It's a good thing that he has the grace to be a little bit ashamed. I tell you Margaret, that fellow is a caution! He is just running the whole family into the ground; he spends more money than the place makes. It gets me hot to see Hetty and Charlie wearing their old clothes and Mrs. McFarlane working like a slave—"

"Do you know," Margaret interrupted, "she did all the chores this morning. Charlie wouldn't get up because Harry wouldn't. Hetty was getting breakfast, and she called them a dozen times."

"It's rather hard lines on Charlie. I don't blame the kid for getting sulky. He does all the work and Harry spends all the money and he's getting to feel wicked about it all. Look here, Margaret, here's something I'm sore about." He dived into his desk and brought out an account book.

"Here," he said, pointing to a column headed, "For board at McFarlane's." "Here, one day Harry got twenty dollars of me—said his mother told him to ask for it, he had to pay an insurance assessment The next day he got five more and the week after fifteen, and now it is the time I usually settle with Mrs. McFarlane and he has drawn more than I owe her. I don't know whether she knows it or not."

"Why do you let him have it?" asked Margaret. "I wouldn't."

"Well, he always says that his mother told him to ask for it; maybe she did, but I don't think so."

"And you don't like to ask her about it?"

"Why, no. Don't you see? She's a proud woman, and would never own but what it was alright anyway, and Harry the best boy in the world except when he gets drunk. She's something to blame, too, but I suppose she can't help it. She can't be firm with him like a man could, and now, since he stopped drinking for a while, she has let him have everything he wanted to reward him and keep him satisfied and the big lout seems to think he deserves it all. I don't believe Hetty has had a rag of anything new to wear since I came here, and just look at Charlie. He's small for his age, but his coatsleeves are half way up to his elbows."

Margaret's eyes began to flame.

"That isn't right! That isn't fair!" she exclaimed. "How can she allow that? and she seems such a good woman, too."

"She is a good woman. She is ready to slave and sacrifice for them all and she never sits down without picking up that worn, old Bible of hers."

"I believe slaving and sacrificing is rather the easiest thing for some women to do, and the right thing is the hard thing. I wish they were not so weak. I wish there were more Spartan women in the world to say to their sons, 'Come home with your shield or on it.'"

They were silent and thoughtful for a moment and then—

"What's that?" asked Margaret suddenly. A rustling sound in the loft overhead had disturbed them

"Must be my kitten. I put her up there to catch mice. They nest up there in the cotton waste and they spoiled a case of butter for me the other day."

"I think you had better pay for your board in advance after this, so there will be nothing for him to draw upon, and save that poor woman all the trouble that you can, Herbert."

"If that precious son of hers would only break his neck, coming home some night, that's the only way trouble could be saved for her," was Herbert's cheerful reply as he went back to his work and set the machinery in motion again.

The stairway that led to the loft was out in the engine room and in the noise of the wheels a man stole quietly down those stairs and passed out without being perceived.

Harry McFarlane had been plowing in a field near the creamery, and it was a broken bolt in his plow that had led to his eavesdropping. He wanted a hammer to knock it out and a piece of hard wood to be whittled into a substitute, and went over to the creamery to get them. to the creamery to get them. Catching a glimpse of Margaret's dress through the door he climbed into the loft where, through the loose boards in the floor, he knew that when the machinery stopped he could easily hear all that was said.

He was really not prepared for that which overtook him, the usual fate of eavesdroppers. It was nothing less than a desire to hear something that would raise him to his usual level of self esteem that had sent him up there to listen. He had been very uncomfortable for two whole days and was getting tired of it. Of course Herbert was fond of him for all his blunt ways. He knew that Herbert thought him a pretty good fellow and didn't the girls always admire him? And so he had sought a salve for his wounded vanity.

His heart was hot with mingled emotions of shame and anger, as he took his way back to the plow. He had been ashamed before, but it was only the personal vanity of Harry McFarlane that had suffered. His mother and Hetty and Charlie—he had hardly thought of them—and it was for them only that Herb and his sister were concerned. They hadn't even hinted that it was a sad thing for such a fine fellow as he was to go to the dogs. He was not worth their pity. What was it all to them anyway? What business had Herb to talk about saving his mother trouble? That was his affair.

His mother—Harry had meant to be kind to her. He saw her sitting in her corner, the farthest from the fire, her sorrow-lined face bent over the old Bible, while her trembling hands turned the worn leaves in search of the promises of comfort to the widowed and those who mourn. He thought of the way in which he had played the noble role of being her support and comforter since his father died. Well, he had meant to be good to her and now these people were pitying his mother and planning to save her from the trouble he had made.

The broken bolt was still in the plow when Harry got back to it. He was still without a hammer, so he sat down on the handles and went on thinking. It was nearly an hour later that he unhitched his horses and drove them up to the house.

"I'm going to Hillsboro," he announced at the kitchen door. "The plow won't work. I'll have to get a new bolt to fix it."

"Going to Hillsboro! Oh, Harry!"

His heart smote him as he saw the fear in his mother's face. He turned quickly away from her, but his voice rang out clearly:

"I'll be back in a couple of hours, mother. I'm going to take the gray colt up. Jim Duncan offered me a hundred and fifty for her and I'd be a fool not to take it." The gray colt has not been needed on the farm, but Harry was proud of his driving horses and had twice refused to sell her.

Dinner at McFarlane's was early that evening on Margaret's account. They were all there except Harry and the meal was a merry one. Herbert had his carriage ready and when Margaret kissed Hetty and her mother goodby, it was with the joy of knowing that she had conquered their reserve and was leaving warm and friendly hearts behind her. The two and Charlie stood in the doorway

Concluded on page 66

UNTIL MAY 31ST, 1910

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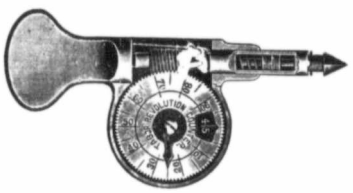

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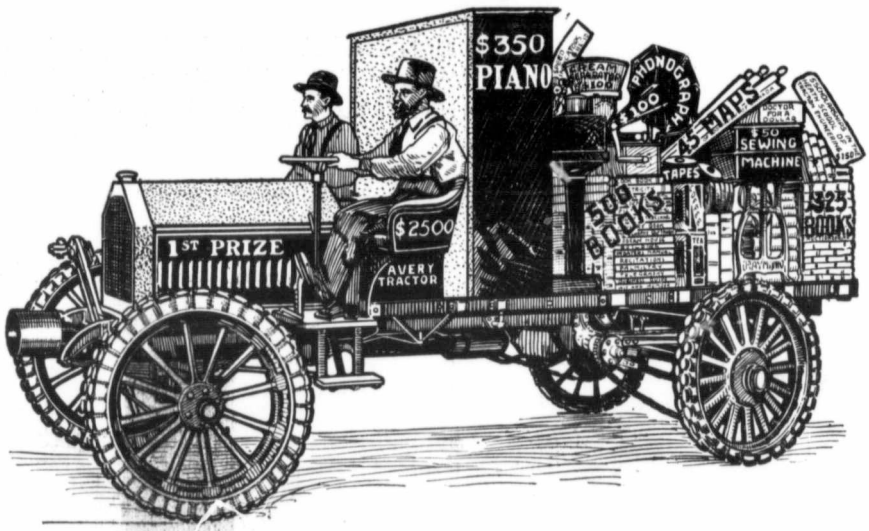

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To put in an estimate on this Big Wheat Guessing Contest, all you have to do is to subscribe for "The Canadian Thresherman and Farmer." The subscription price is $1.00 a year.

Ending May 31st, 1910, "The Canadian Thresherman and Farmer" will carry on a Guessing Contest open to everyone in Canada, except residents of Winnipeg. 8 lbs. 8 and seven-sixteenths ounces of No. 2 Northern Wheat have been obtained, placed in a vessel and sealed up, to remain there until the Contest closes, when it will be taken out and counted by a Board of three judges, none of whom are in any way connected with "The Canadian Thresherman and Farmer." Everybody who sends in a year's subscription to "The Canadian Thresherman and Farmer," either new or renewal, is entitled to a guess.

The bottle was taken to the Dominion Weights and Measures Department at Winnipeg, was filled right to the top with No. 2 Northern Wheat and was found to contain exactly 8 lbs. 8 and seven-sixteenths ounces of wheat. It was then sealed right there in the presence of two witnesses. It was photographed and taken to the National Trust Company, and will remain in their vaults until the Contest closes May 31st.

257,885 was the number of kernels counted in 15 lbs. of No. 1 Northern Wheat in our Contest which ended July first last. 82,405 was the number of kernels counted in 5 lbs. of No. 1 Northern Wheat in the Nor' West Farmer Contest closed recently. 869,762 was the number of kernels counted in a bushel of wheat in 1903 in a Wheat Guessing Contest in the United States. With these facts to work from you should have no difficulty in arriving at an estimate that will win a prize; or better still, obtain a few ounces of No. 2 Northern Wheat and count them and form an estimate from that.

Guess early and increase your chance of winning one of these valuable prizes, for you will understand, it is the first ones who guess nearest that get the prizes. Remember, you may win a prize for every estimate you send in. Ask us to send you sample copies and extra subscription blanks to assist you in forming a club.

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E. H. HEATH CO. LIMITED, WINNIPEG, CANADA

Date.....

Dear Sirs:—Enclosed please find.....for..... year's subscription to The Canadian Threasherman and Farmer to be sent to

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Promotions in the Ranks of The International Harvester Co.

THE appointment of a new division manager to fill the vacancy occasioned by the death of A. E. Mayer resulted in a number of changes in the domestic sales department of the company, R. C. Haskins being promoted to division manager, William Browning to manager of domestic sales, C. H. Laufman to assistant manager of domestic sales, and T. A. Coleman to district manager in charge of the Southwest district.

As many of our readers know, Mr. Haskins became identified with the harvesting machine business in 1873, in which year he entered the service of Warder, Mitchell & Company, which later became Warder, Bushnell & Glessner Company. Ten years later he was appointed district sales manager for that company, and in 1888 he was promoted to general sales manager, which position he held until 1903 when he became domestic sales manager for the International Harvester Company of America, which position he held until March 1, when he was appointed division manager. In his new position, Mr. Haskins will have general charge of the sales, collection and traffic departments of the company.

R. C. HASKINS

WM. BROWNING

C. H. LAUFMAN

T. A. COLEMAN

E. L. VIERS

C. D.ASPENWALL

There are few men identified with the harvesting machine business who are more widely known than William Browning, who has been in the harness for more than one-third of a century, beginning with the McCormick Harvesting Machine Company at Chillicothe, Missouri, in 1876. He has held the position of general agent at Cleveland, Ohio, Pittsburg, Pennsylvania, St. Joseph, Missouri, and Kansas City, Missouri. In 1903 he was made district manager for the International Harvester Company of America, and was promoted to assistant domestic sales manager in 1907, the position he held at the time he assumed the duties of domestic sales manager. It has been said of Mr. Browning that he can call more implement dealers by their first names than any other harvesting machine man.

Mr. Laufman has been engaged in the harvesting machine business since 1879, serving first as general agent in Minnesota with Warder, Mitchell & Company. In 1888 he was transferred to Elgin, Illinois, where he remained for a number of years. In 1895 he joined the forces of the Deering Harvester Company, as general agent at Des Moines, Iowa, and was transferred to Dallas, Texas, in 1897, becoming a general traveller in 1899 and division manager in 1901. He was made district manager for the International Harvester Company of America in 1903, having charge of the Northwest territory, and in 1907 was transferred to the Southwest territory, which remained in his charge until he was promoted to assistant manager of domestic sales.

Mr. Coleman first engaged in the implement business in 1879 as canvasser at Fond du Lac, Wisconsin, for J. W. Marsh. Later he represented the Peerless Reaper Company as general agent at Milwaukee. In 1890 he became general agent at Aurora, Illinois, for the Minneapolis Threshing Machine Company, and in 1894 he entered the service of the McCormick Harvesting Machine Company as general agent at Madison, Wisconsin, in which position he has continued under the management of the International company. He now becomes district manager of the Southwest territory, succeeding Mr. Laufman. Among all the employees of the International Harvester Company there could be found none more worthy of promotion than T. A. Coleman. Mr. A. R. Anderson, who succeeds Mr. Coleman as general agent at Madison, is one of the old employees of the harvester companies. He began his service as "red headed office boy" in St. Louis, and grew up to become the head of that branch upon his own merits. He has experienced but three changes of base in twenty-seven years, these including St. Louis, Springfield and Madison. Mr. Anderson is a fighter of the old school, one of the boys who won his honors by sheer gift and perseverance, and he comes to Madison to one of the best established and best manned agencies in the world.

L. E. Viers, formerly general agent at Milwakee, Wisconsin, has been called to the general offices in Chicago to take charge of the cream separator department. Mr. Viers entered the employ of the Milwaukee Harvester Company in 1890 as canvasser and expert, and worked in that capacity until the block system was put in force when he was placed in charge of a block. In 1899 he was appointed general agent at Columbus, Ohio, which position he held until the formation of the International Harvester Company of America, when he became general traveler from the Chicago office, later being appointed general agent at Albany, New York, and afterwards transferred to Milwaukee.

C. O. Aspenwall, formerly general agent at Council Bluffs, Iowa, has been called to the general offices in Chicago, and placed in charge of the gasoline engine department, succeeding J. L. Martin, who leaves the selling organization. Mr. Aspenwall has been connected with the implement business since 1888, in which year he entered the employ of a local implement dealer in Marshall, Wisconsin. In 1890 he accepted a position as expert for the Deering Harvester Company with headquarters at Madison, Wisconsin. Mr. Aspenwall has been in the employ of nearly all the larger harvesting machine companies, going to D. M. Osborne & Company from the Deering Company and later entering the service of the McCormick Harvesting Machine Company. In 1896 he went with the Warder, Bushnell & Glessner Company and later joined the forces of the Milwaukee Harvester Company, and when the International Harvester Company of America was formed in 1902 he was placed in charge of the Champion Division general agency at Lincoln, Nebraska, going to Alliance, Nebraska, the following year, and in 1904 he was transferred to Council Bluffs. Of the twenty-two years that Mr. Aspenwall has spent in the harvesting machine business, it is said of him that since 1891 he has not lost a day's time or salary—which is a record that speaks for itself.

The Bolt That Parted

Continued from page 63

watching until their guest was out of sight.

They had gone but a mile or so when they met Harry driving rapidly homeward. His face was bright and handsome and he touched his hat with a graceful gesture that had in it a bit of mischievous bravado.

"Goodby to you, Miss Allen," he called out as he passed.

"That's just the way he is," grumbled Herbert. "He thinks he can carry off anything. He is proud of being a devil-may-care fellow."

But Harry went on his way home, unharnessed and fed his horses and went into the house. His mother was sitting with her mending on the couch and he dropped down beside her, taking a roll of bills from his pocket and smoothing them out on his knee.

"Here, mother," he said, "this belongs to you. It's the hundred and fifty I got for the colt."

"Why, Harry,—the colt was yours, you know." Mrs. McFarlane touched the bills in a confused and hesitating way.

"But the money is yours just the same," Harry stoutly assured her. I had quite a little from Herb this last month to pay that insurance bill, you know, and—I didn't pay it. I've been spending more than my share. You and Hetty want things and Charlie needs a new suit of clothes. Charlie wants to go to the academy over in Hillsboro and he is going. And say, mother," Harry went on, raising his head manfully and speaking with a new tone of gentleness in his voice, "dont' you be breaking your heart about what happened the other night. It is not going to happen again. There's no reason why I shouldn't go on trying to keep my pledge even if I did fall down once and if I fall again I'll just keep on trying. You'll see, mother."

Hetty and Charlie were staring in from the kitchen doorway. Charlie's face grew very red.

"The devil you will," he exclaimed, diving for his hat and making a break for the open air. Once outside, however, he stood still looking off over the brown fields with a strange look of wonder growing upon his wistful, boyish face.

"He wants me to go to school," he said softly to himself. "He wants me to have a new suit of clothes." A mist came before his eyes and a choking sensation in his throat.

Inside the house, a worn, old woman sat with a face of radiant joy, one trembing hand going out to clasp her son's, and the other feeling for the covers of a worn, old Book.

For nothing I will tell you all about Cement

You may have my expert advice without charge. I can save you considerable money. I charge nothing.

These pictures show you plainly how simple a matter it is to change a decrepit frame house into one of cement-stone.

For the asking, you are welcome to use my knowledge. You can inform yourself fully on the whole big question of the use of cement for practically every use you are probably putting lumber to now. I will instruct you fully, in plain language, in the use of cement for making anything from a fence-post to a dairy-barn. And I can show you how to save money by using cement for any building purpose instead of using wood. Simply tell me your name and address and mention what sort of a structure you think of building or repairing—whether a residence, a poultry house, or even a drinking-trough. You have nothing at all to pay for the advice and instruction I will promptly send you. Write to me before you buy another bill of lumber for any purpose. Be sure to.

YOU pay nothing for what I tell you.

And the reason I offer you my services for nothing is simply that the companies that employ me want the farming community awakened to the value that cement—of the right kind—has for every farmer. Even if they never sell you any cement, they want you and your neighbors to be informed on the uses of cement—and the ease and simplicity with which you can cheaply use it.

No High-Priced Labor Necessary

I can soon show you that it does not require an expensive mechanic to use cement-concrete instead of lumber for ANY purpose. I make the whole subject so plain and simple that you yourself could easily renovate your frame house, barn, hen house, wagon shed. I will tell you how to make a hundred farm-utilities from cement quickly and cheaply—more cheaply than you could with lumber. And bear in mind the fact that you are charged nothing for this "Education in Cement-Using." You will not be bothered to buy anything, either. There are no "strings" to this talk of mine—not one. Just write me and ask questions.

Cement Endures—Lumber Decays

That alone is the biggest reason why you should overcoat your house and barn with cement, as I will tell you precisely how to do. Cement is almost indestructible. Buildings exist in Great Britain and elsewhere that were built of cement by the Romans two thousand years ago. For cement rightly used—as I will show you how to use it—makes structures fire-proof; wet-proof; decay-proof; warmer in winter; cooler in summer. And it is ECONOMICAL—much more so than lumber, for ninety-nine uses out of a hundred.

Verandas
Box Stalls
Driveways
Fence Posts
Well Curbs
Feed Yards
Barn Floors
Cellar Walls
Root Cellars
Horse Blocks
Chimney Caps
Chicken Houses
Watering Troughs
Curbs and Gutters
Windmill Foundations
Storage Water Tanks

Read This List of a Mere Few of the Uses Cement has on the Farm

Then write to me for particulars of how to build these things from cement—doing the work yourself, if you like, in spare time. Don't wait to write because you are not just ready to make any improvement to your buildings. Talk it over with me if you only need a few fence-posts or a watering-trough. Even on those small items I can save you considerable. Just write me.

Alfred Rogers
THE CEMENT MAN

Why not write me to-day? Accept my free services, make use of my knowledge to any extent; and you will not be under the least obligation or expense if you do. We want you to KNOW cement; and I will do all I can to help you KNOW it.

ALFRED ROGERS THE CEMENT MAN

322 Stair Building, Toronto

1

The Revolt of Bismarck

By KENNETT HARRIS

How a High Explosive Helped a Low Ebb of Courage

A MAN may have sand and nerve, but when a whooping cyclone comes corkscrewing along at a-mile-and-a-half-a-minute wiggle and a cellar door is gaping at him he's going to duck, and he don't care a darn about dignity doing it. He may not be afraid to die, but when Death pops up like a jack-in-the-box and grins in his face, and it's back down quick or gulp your gruel, it's apt to be a crawl—that is, if the man is healthy and ain't bothered with love or liver troubles. Can you stop me batting my eyes at you Well, some men can shoot as quick as I can bat an eye, and if they can make other people believe it they've a cinch on consierate treatment in a mining camp in the Hills, whatever they may get in New York or Boston. If one of them men looks at you with a capering red-hot devil of murder in his eye and a gun close to his itching fingers—a gun with thick, black, snub-nosed, greasy cartridges in it—and you know that all that stands between you and the pearly gates is the lack of an excuse, you ain't going to furnish the excuse if you can help it, eh? Certainly not. Well, that accounts for this Brown."

Thus spoke Shorty West, dangling his heels from a loaded timber-car waiting at the tunnel switch through the noon hour. He drained the last of the cold coffee from the little tin cup, jammed the cup down on the top of his emptied dinner-pail with a dexterous slap of his calloused palm, and continued:

"Guadalupe Brown was the nom dee plumage he adopted when he winged his flight from the southwest corner of New Mexico. It got too hot to hold him down there, and it was a cool summer at that; but his ideas on the sanctity of human life and the relative values of royal and bobtailed flushes was too limber and wabbly for them Donna Anne champions of peace and unpolluted poker to stand for. It sounds like being turned out of Tophet for immoral behavior, but I reekon there's a limit to most things, most places.

"He was a big, dark, hook-nosed duck, with the eyes of a rattlesnake and the affable smile of an alligator; polite to strangers, but as deadly as an absent-minded drug clerk. He was a sensitive cuss, too. If anybody contradicted him, or didn't give him what he wanted, his feelings would get lacerated, and when he got that way he wanted warm, fresh gore right off. So we humored him—made a point of it, gave him what he wanted, and as wide a berth as we could, for he didn't calculate to be shunned.

"It was some humiliating to us Strawberry Gulchers. We didn't mind being separated from our wealth so much; that came in the course of nature and we'd have felt unhappy if we kept it, anyway; but wearing whiskers and pants, and most of us did, we wanted to have some say as to the methods of scattering it We had what Judge Frye calls our preconceived prejdices in favor of four aces to the deck, and Guadalupe shocked 'em right along. He was naturally light-hearted, and willing to contribute to the entertainment of our friends, but we hated to be called upon to promiscuously dance a solo obli-gatory with chunks of lead splintering up the floor around our light fantasic toes. Not that we all had to take that sort of thing, but we all felt that we might have to at 'most any time. Not to put too fine a point on it, he had us buffaloed.

"That's the way I frame it up, anyway. I reckon to this day there ain't nobody but me willing to admit it. If you'd gone around and took a census of opinion regarding Guadalupe, you'd have come to the conclusion that there wasn't no reasonable cause for

"Then the Terror Howled for the First Time"

complaint. We admitted that he had his peculiarities, but we'd admit likewise that we had peculiarities of our own, and, sort of intimate, that we sympathized with 'em. It wasn't no use extending condolences; they didn't go. I'd remark to Sam Hardwick, who was running the wheel in at Paul Kleman's, that it was too bad he had to be the victim of a hold-up at his reverend years, referring to an occasion when Guadalupe had insisted that he'd bet on the number next to where his little pallid chip was reposing when the marble clucked into its hole. Sam would deny the soft impeachment, and the starch would begin to scoreh on his neckband right away.

"'Any old time I let Guadalupe bluff me—or any other son-of-a-gun—you just let me know,' he says. 'Not that Guadalupe would try to bluff; he's too much of a gentleman. All the same, I ain't unreasonable. He claimed that the door opened just as the ball stopped rolling, and the draft blew his chip over from where he'd put it. That seemed to me a reasonable theory. I know the door did open, because Doc. Stewart came in right then, and he couldn't have squeezed through the keyhole farther than his waistband. I wouldn't take advantage of a draft of wind to skin nobody; don't you never think it. Nor I don't want no insinuations respecting hold-ups. That aint' pretty talk. If the wind blew Gaudalupe's chip from the winning number he was morally entitled to win. I ain't a man to stand on a legal technicality. So I paid.'

"'It was right high-minded on you, Sam,' I says, with admiring warmth. Then I goes over to Cicero Bentley. 'Why didn't you tell him to go to thunder an' that you didn't feel like dancing, Bent?' I asks him.

"He looks at me with the danger signal out, and lifts up his voice, as if he thought I was hard of hearing.

"'Who told you I didn't feel like dancing?' he inquires. 'I reckon I can hop around a little when I'm in a joyous mood without the whole camp indulging in airy bandages. It's a thing I often do.'

"'It was a good, lively hoe-down,' I says, 'an' plum energetic, but he might have shot your feet up.'

"'Not him,' says Cicero; 'I wasn't in noways uneasy about that. I'd as soon have a dozen whanging away at me as not if they was all as good shots as Guadalupe; it's as good as music to me. I want you to understand that there wasn't no compulsion about that hoe-down; there wasn't no offense meant and none took. We was all having a little time together, and that's all there was to it. If I feel like doing a few fancy steps any time, I'll do 'em, an' there ain't nobody going to stop me. You understand that, don't you? As I say, I don't take offense where there's none meant, but, if any half-baked, fat-headed, can put it all over me, and then rub it in without realizing on his accident policy, he's apt to see a great white light with stars in it.'

"'That's what I've been telling 'em, Bent,' I says, and then I asks Jimmy Tolliver if he considers that a pair of queens is entitled to precedence over a straight. Jimmy allows that he hasn't looked into Hoyle lately and couldn't undertake to commit himself positively. At the same time a flush mounts to his brow. He explains that he felt a doubt about the matter himself at the time, seeing his straight was only jack high, and so he let it go; but, however it was, he didn't like to go back of the returns when the game was finished, and he had no reason to suppose that Guadalupe backed the queens' hypothesis with an earnest born of anything but sincere and honest conviction. At the same time Jimmy disapproves of Bentley's want of spunk in dancing on Guadalupe's say-so, and Bent didn't suppose an old-timer like Sam Hardwick would back down afore any man's bluff. Hardwick thought that Jimmy Tolliver was gettin' weak in the knees, and reckoned he'd better leave poker alone and learn to play authors, and so on down the line. All this got back to Guadalupe, of course, and he'd smile his alligator smile, but he wouldn't say nothing. As a general thing he didn't go out of his way to make trouble; if he wanted any he could stir up a batch most any time wherever he happened to be, and, if he hadn-t broke through that rule with Bismarck, he'd probably have been homiciding around the Hills somewhere yet.

"Bismarck was a shoveler on the Morning Glory, of German extrac-

tion which three years in the land of the free hadn't quite extracted. He looked a heap like Bismarck didn't, which sugggested the name. He was about five foot six and an eighth high, and slim in proportion, with skim-milk-blue-eyes, and a faded cornstalk-colored beard that straggled weakly out from his face in straight lines. His general conduct was meek, and his ideas of himself were lowly, so you wouln't have thought he'd cut much figure with a good-looking, high-stepping, come-back-at-you-lively lady like Lizzie.

"Lizzie slung the onion-flavored meat resurrection at Ferguson's boarding-house, and a fairer creature never carried a tray of dishes or kicked the paint off the bottom of a kitchen door. Half of the unencumbered population of the gulch was foolish about Lizzie. I was somewhat addicted to her myself, to tell the truth, and I don't blame me. I never seen her when her apron wasn't as white and stiff as suds and starch could make it, nor when her snappy black eyes wasn't bright, nor her cheeks red nor her tongue ready. When she moved, her heels struck the floor like a shingling hammer on a roof, and she could deal out a pile of side-dishes around a table as slick and swift as Jimmy Tolliver could a card-deck. And, with all them graces and accomplishments, darned if she didn't take a shine to Bismarck.

"There wasn't any suspicion but what it was just pity for him, for a long time. Lord only knows what makes women take the notions they do! We seen that he got the biggest chunks of butter and the tallest pile of cakes and the best end of the grub lay-out generally, but it only come on us by degrees what was the matter. The red on her cheeks got a little redder when she'd ask him if he didn't want another cup of coffee, and she called him M. Schuler, and didn't josh him like she did the rest of the boys; but that didn't seem open-and-shut proof of anything. As for Bismarck, he didn't catch on either, though those skim-milk eyes of his would follow her about the room when he thought she wasn't looking in a way that didn't leave no doubt as to the state of his emotions. Things was in this happy condition when Guadalupe happened to take notice. Up to that time he hadn't paid no more attention to Bismarck than he had to Ferguson's cat.

"Lizzie had just set down the bread-plate on the other side of the table from Bismarck when she happened to look across and catch his eye. Bismarck generally looked away when such a thing occurred, but this time his eyes sort of got tangled with hers, and he couldn't break away. You know how it is, don't you? Well, while he looked, a warm vermilion climbed upon his countenance and kept climbing until the parting of his hair showed life Ogallala squaw's. Lizzie got some fine mountain sunset effects in her face, too. It sure was a sweet sight, but it didn't last long. Somebody snickered, and Lizzie made a beeline for the kitchen, while Bismarck in his agitation began to shake tomato catsup into his coffee. That brought out a general howl.

"'Who's been boiling your face, Bismarck?' asks Bill Timmy.

"'It vas nod boiled," says Bismarck.

"'You ought to boil it,' says Timmy; 'it might look better cooked than it does raw. All I want to say is that, if you trifle with that poor girl's affections the way you've been doing lately, I'm going to crawl your hump all spraddled out. Ain't you ashamed of yourself? It may be sport to you but it's death to her. There's dozens of good, honest-hearted miners around this camp what would make that girl an A-number-one husband if you'd pull your freight and leave the track clear; but you hang around with your slick, taffy-slinging tongue, and your high-toned, foreign ways, and your good clothes, and get her razzle-dazzled just to amuse yourself and pass the time.'

"'I nefer haf spoke von vord mit her,' says Bismarck, real earnest. 'I vouldt nod do sooch a tings.'

There was another howl then, and Guadalupe, who had been listening with his eyes half shut, leaned over the table and called to Sam Hardwick.

"'What is that thing with a faint resemblance to humanity sitting next to you, Samuel?' he says. 'You'll pardon my curiosity, but I thought I heard it make sounds like it was alive.' Oblige me by jolting it in the ribs just to see if it will squeak again.'

"Sam promptly dug his elbow into the Dutchman's side, and then excused himself. Bismarck was just aiming a chunk of boiled beef at his mouth and it landed in his whiskers up near his eye. 'You vos vilkom,' he says to Sam, wiping himself off with his shirt-sleeve.

"'Don't mention it,' says Sam, winking at Guadalupe.

"'He ain't human,' says Guadalupe, sneering. 'You might try pouring a glass of water down his neck. Never mind, though. Let him alone.'

"He pushed his chair back from the table and walked around behind Bismarck, easy and unconcerned, and made a quick grab at his neck and pushed his nose down into his plate, and held it there. Bismarck squirmed around, but he couldn't get loose, being jammed in between the chair and the table. Finally Guadalupe let him go, and he jumped up, scraping the food off his face. Just at that minute Lizzie came into the room, and stopped short, staring. Bismarck didn't see her.

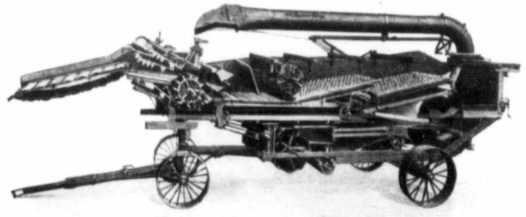
"'Dot vas no vay to act,' he sputtered, real peevish. His eyes had a kind of shine in them, too. Guadalupe smiled unpleasantly.

"'I just wanted to see what you would do,' he said.

"Just for about ten seconds Bismarck did his level best to glare—

Continued on page 80

Avery Machinery Does Good Work



STORIES OF THE STRAW PILES.

In order to be able to submit to you definite proof, based on actual field tests, that an Avery "Yellow Fellow" is a wonderful Grain Saver, we sent out one of our men last fall to make a few canvas tests. The results of these tests are here presented before you. They are evidence beyond question—not claims, but actual tests—and must convince every thresherman that an Avery "Yellow Fellow" does wonderful work—almost perfect—in saving the grain.

"I made a canvas test to-day on my 36x60 Avery Separator equipped with Avery Feeder, W. S. and I. X. L. Picker, and the test showed that the Separator was saving 99 92-100 per cent of the grain. We had eight men pitching, and the feeder was kept full. This test was made on the A. Holte job." Halver Gunderson, Owner.

Davenport, N. D., Sept. 19th, 1909.

We, the undersigned witnessed the above test: O. J. Holte, Ole Jacobson, Peter Engene, A. J. Holte, Olai C. Lybeck, Oscar Rosendahl, Oscar K. Lybeck, H. M. Myhra.

"I made a canvas test to-day on a 1909 36x60 Avery Separator equipped with Avery Feeder and W. S. and the wastage was only 1-16 of 1 per cent. We were threshing at the rate of five bushels per minute for Peter Larsen, ten miles west of Sheyenne." Ole Guttearud, Owner.

Sheyenne, N. D., Sept. 28th, 1909.

We, the undersigned witnessed the above test: A. G. Nelson, Theo. Sylling, Chas. W. Linden, John Schen.

"I made a canvas test on my 42x64 Avery Separator equipped tith Avery Feeder and Wind Stacker, on the farm of Herman Hackbarth, with five men pitching and the wastage was less than 1-13 of 1 per cent." E. J. Boelter, Owner.

Hector, Minn., Sept. 8th, 1909.

We, the undersigned witnessed the above test: Herman Hackbarth, Otto Beack, Wm. Baumgartner, Fred Brede, Louis Boelter, C. Dries.

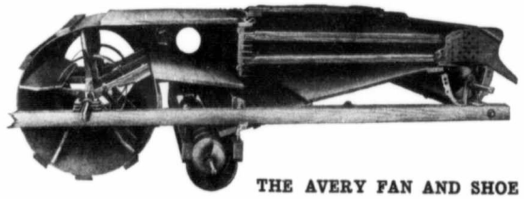
Twelve canvas tests show an average wastage of less than 1-13 of 1 per cent or an average saving of 99 92-100 per cent—Almost no wastage at all.

They are positive proof of the fine work that an Avery "Yellow Fellow" does in saving the grain.

THE I. X. L. GRAIN SAVING SEPARATING DEVICE.

The greatest invention made for tearing up bunches of straw and getting out the grain. The teeth pick or card the straw, give it a fast travel and thin the layer down as it passes underneath so that any grain can easily drop out.

Every Avery Separator is equipped with an I. X. L. Grain Saving Separating Device. This is one of the reasons why an Avery Separator does **Good Work** in **Saving the Grain.**



THE AVERY FAN AND SHOE

Special Steel Bands in the fan prevent Cross Blasts. The Fan is farther from the Shoe than in many Separators, giving blast time to spread out more uniformly over the sieves. The Fan housing is built up higher between Fan and Shoe, thus placing strongest blast on the front end of the sieves (just where it is needed).

These are some of the reasons why an Avery Separator does **Good Work** in **Cleaning the Grain**.

MR. THRESHERMAN and ALL OTHERS interested in GOOD WORK MACHINERY.

Good Work means a lot of things. It means JOBS. And JOBS mean PROFITS. It means new customers every year and ALL the OLD ones. Praise from your customers and no Kicks. And all this means GOOD PROFITS in your POCKETS at the end of the Season, and SATISFACTION in your MIND.

Last month I told you why it pays to get an Avery Machine because it is BUILT TO LAST—from the users' Point of View. Now I want to tell you why it pays to get an Avery Machine because of the WORK it DOES.

READ THE STORIES OF THE STRAW PILES. We don't simply claim that Avery "Yellow Fellows" Save the Grain—here are the Facts to Prove it—Evidence based upon Actual Field Tests. Note the percentage of saving—99 92-100 per cent. ALMOST NO WASTE AT ALL.

Look at the plowing scene with the long line of furrows laid over like ribbons. It speaks for itself. An illustration of the plowing done by an Avery Steam Plow Outfit shows plainly the GOOD WORK it does. Read the letter just received from a purchaser in North Dakota.

WE HELP YOU TO FIND OUT ABOUT THE WORK THAT AVERY MACHINERY DOES. We made these canvas tests because we wanted to show you exactly what Avery "Yellow Fellows" do in saving the grain. We are all the time getting photographs of plowing to show you the kind of work that an Avery Steam Plow Outfit does. You will also find in our catalog skeleton views of all our Machinery, as well as detailed illustrations of almost every part. WE WANT TO GIVE YOU EVERY POSSIBLE CHANCE TO FIND OUT ABOUT THE CONSTRUCTION OF AVERY MACHINERY AND THE WORK IT DOES.

You ought not to place an order for an Engine, Separator or Steam Plow until you fully investigate Avery Machinery. Write for a copy of our catalog. Ask your neighbor who is an owner of an Avery about it. Write to some of the users of Avery Machinery whose names we give in our printed matter. We want to show you that when you put your money into an Avery Engine, Separator or Steam Plow, that you get a machine that will do the kind of work that will please you and your customers.

WRITE US FOR INFORMATION ABOUT AVERY MACHINERY BEFORE YOU BUY.

Yours for building GOOD WORK MACHINES,

J. B. Bartholomew,
President.

AVERY UNDERMOUNTED ENGINE AND PLOW.

This shows you the kind of work an Avery does.

You never saw cleaner or better work.

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My Avery 30 H. P. Double Undermounted Engine and 10 bottom Plow is doing excellent work. Everybody says it is the best rig in this country. Crowds watch her every day. Am plowing half mile away from town. Ground rather rough and uneven, and plows drop into every hole and plow it all even. Best job I ever seen in Engine breaking.

W. E. Duncanson,

Hettinger, N. D., April 4th, 1910.

For your own best interest, you should not buy a plow outfit until you have found out all about the construction and work of an Avery Undermounted Engine and Plow.

Do you want an All-round Engine for Belt work, Plowing, Hauling and other work?

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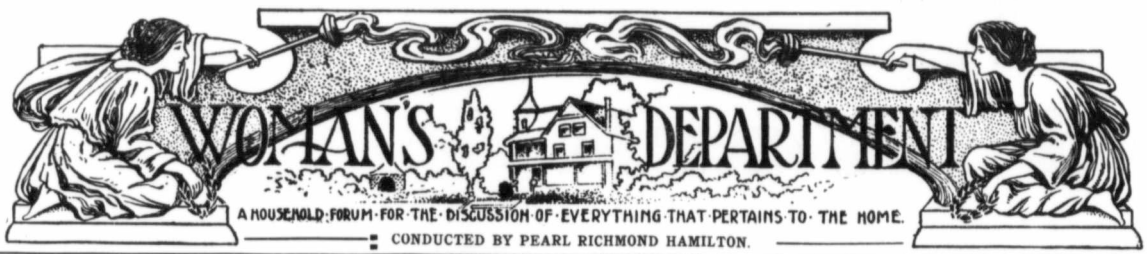

CONDUCTED BY PEARL RICHMOND HAMILTON.

Two Pictures.

By Annie Green (Marian Douglas).

An old farm-house with meadows wide,
And sweet with clover on each side;
A bright-eyed boy who looks from out
The door with woodbine wreathed about,
And wishes his one thought all day:
"O, if I could but fly away
From this dull spot, the world to see,
How happy, happy, happy,
How happy I should be!"

Amid the city's constant din,
A man who 'round the world has been,
Who, 'mid the tumult and the throng,
Is thinking, thinking all day long:
"O, could I only tread once more
The field-path to the farm-house door,
The old green meadow could I see,
How happy, happy, happy,
How happy I should be!"

We Two.

We two find joy in any kind of weather;
Or if the earth is clothed in bloom or snow,
If summer days invite, or bleak winds blow,
What matters it if we two are together?
We two, we two, we make our world, our weather.
"Just tak' the day as it comes frae God,
Sae sweet an' pure o'er the fresh green sod."

Tak' it, an' use it, for a' that's guid,
Ne'er forget that your sorrows amid,
Tak' it, an' dae aye the best ye can
For a' aroon ye, w'heart an' haun;
Tak' ilka day as it comes."

THE SECRET OF LONG LIFE.

Fresh air and sunshine will do much to keep you young, and who is the woman that has not the legitimate ambition to keep young? But to resort to artificial methods is a great mistake. The mental condition has much to do with the retention of youthfulness. In the first place a woman should never surrender herself to the idea of age. One should keep the mind fresh and strive to interest one's self in the things that interest their youthful friends. One should try to retain not only the mental but bodily buoyancy, resisting the tendency to the slow and lagging step and the wilted and weary air to which the weak-spirited succumb, by aiming always to be cheery and companionable and taking a sympathetic interest in all around them. A woman who will observe these suggestions will not only keep and look young for years after actual youth has passed, but when the signs of age do appear they still seem to have preserved the youthfulness of soul which, with their experiences makes them charming and companionable.

We occasionally meet a woman whose old age is as beautiful as the bloom of youth. We wonder how it has come about—what her secret is. Here are a few of the reasons:

She knew how to forget disagreeable things.

She kept her nerves well in hand and inflicted them on no one.

She mastered the art of saying pleasant things.

She did not expect too much from her friends.

She made whatever work came to her congenial.

She retained her illusions and did not believe all the world wicked and unkind.

She relieved the miserable and sympathized with the sorrowful.

She never forgot that kind words and a smile cost nothing, but are priceless treasures to the discouraged.

She did unto others as she would be done by and now that old age has come to her and there is a halo of white hair about her head, she is loved and considered. This is the secret of long life and a happy one.

An editorial referring to the forty-second annual convention of the National American Suffrage Association at Washington says:

"The women identified with this great cause are displaying wisdom. They are not militant. They do not seek to gain by duress nor by any display of force the right which they claim as inherent. They have taken the broad ground that not only the law-makers, but the men as well as the women of the nation must be educated to the knowledge that in the granting of the suffrage right to women lies the logical and ready solution of the perplexing economic problems of the body politic.

And so the effort being made in Washington is first to elucidate and make apparent the real reasons why women should vote. As indicative of the fact that there are millions of men and women in the United States who have become convinced that in the extension of the right of suffrage to women lies the solution of many problems, a petiton bearing the names of these converts and signers will be presented to committees of the two houses of congress. This petition serves as the credentials of the delegates and testifies to the fact that they speak for and represent the people.

It is worthy of more than passing notice that a great change has taken place in the popular mind within the last decade regarding this movement which is now being so intelligently promoted. The attitude of the people—the masses—toward the suffrage cause in the United States is in peculiar contrast to that in Great Britain. This is not due, perhaps, so much to the proverbial chivalry of American men as to the difference in methods employed by the leaders of the cause in promoting public sentiment and shaping popular thought. These women—Dr. Anna Howard Shaw, Professor Frances Squire Potter, Mary Ware Dennett and a score of others—have never lost sight of the fact that if their cause is to succeed it must succeed because the people recognize its justness and practical worth. And so the campaign now, as heretofore, is one of education. The people have been slow to learn, because it has been necessary to overcome prejudice and prejudice is but a form of ignorance.

The Washington convention may not bring universal suffrage this year nor next, but it will mark an important epoch and another milestone nearer the goal sought."

Correspondence Corner

Dear Readers:—

The editor is pleased to receive the correspondence that has come in during the past month. We read article after article of theory—we need them—but we need even more, practical letters of experience. I am pleased that my readers are beginnig to write, because these helpful words from one another will make our department seem like a home where all are anxious to come for comfort and inspiration. Write to us about anything that interests you. If it be of interest to you it will help another. There are many subjects for you to discuss in this department—the care of children, conditions in schools, problems of the home, gardening, poultry-raising; then there are vital questions before the public just now—The Dower Law, The Homestead Act for Women, and Suffrage—all of which I shoud very much like to see discussed in this department. When a woman reads of something a sister reader has done successfully, she is more than likely to duplicate the success herself. Let us come every month to these pages with a feeling of genuine interest, and the department will benefit you more if you yourself contribute a letter that will help another sister in her work. This department belongs to you.—Sincerely, P.R.H.

Editor of Woman's Department:—

In reply to your question as to whether the woman's department is practical and useful to women on the farm, I say, yes, very much so. In the last copy of the Thresherman there are many very useful receipes and other matter which I intend to cut out for future use. I save the paper for that purpose. I look for each issue of the paper and take great interest in it. I cannot forget the editor who is so mindful, as to take such an interest in farmers' wives. All instruction in your department can scarcely be improved upon. With best wishes,

I am sicerely your friend,
Mrs. E. M.

Bagot, P. O.

You cannot realize how much this letter helps me. We all like to be appreciated.—P. R. H.

Dear Editor:—

I am anxious to learn more about the Farmers' Clubs that are being so helpfully conducted in some places. Are any of your readers members of a club? If so, will they volunteer information regarding them as we wish to start one in this community. I hear they are a great help to farmers' wives.

Wishing this department success, I am, An Interested Reader.

Will some one kindly write a letter answering this request.?—P. R. H.

Dear Editor:—

I have read so many papers about the dangers of giving children too much, that I am tired of it all. I have seen many children turn out discontented and resentful because they were denied too much during their childhood; while, on the other hand, I have seen many children who were given much during childhood grow into unselfish, helpful men and women, charitable in every way.

I have known boys and girls long to be old enough to leave home because they were given so little while they were children. They would say: "We have nothing at home for amusement like Mary or John who live near us."

Perhaps they had urged their parents for games, or an organ or piano; but their parents denied them everything but food and clothing, and very little of either. These boys and girls left home as soon as possilbe. Some of them ran away. Then the father and mother with worried brows, exclaimed: "Why don't our children like their home?"

Then I have known other boys and girls whose parents gave them as much as they could and made their home so attractive that when they grow to manhood and womanhood they would not leave home, and when they did, their happy childhood, made possible by generous parents, made them happier and more charitable with others. In many cases the parents who made the home more attractive for their children were less able to than the parents who did not believe in giving the children too much.

The parents who did their best to make their children happy may not have so much wealth in the end but they have the satisfaction of knowing that the old home is rich in family love and pleasant memories. While, on the other hand, the penurious parents in their old age sit in luxurious homes—homes whose walls echo loneliness and poverty of family love and are empty of pleasant memories. After the children, who had been deprived of comforts and pleasures in the home, had all left the parental roof, I have seen their parents build and furnish an elegant home and settle down to enjoy life. And not one child from that home could look back on their childhood without a shudder. I have heard every child in that home say "I cannot bear to think of my childhood—we never had anything without begging for it. I have cried for days before I would ask father for money for a new dress."

These children were robbed of their individuality. The parents are wealthy now but they sacrificed the childhood life for their wealth.

I am a farmer's wife and we are not wealthy but my children shall not be denied anything I can give them. The woman who helped me more than any one else was one who had a full childhood, and I shall pass her kindness on by making the home of my boys and girls attractive and giving them what I can. Wishing this department success, I am, sincerey,

Brandon, Man. A Mother.

I wish my readers would discuss this problem of "Indulging Children." This letter is certainly full of truth.—P.R.H.

Will some of the readers of this department write their views of the dower law? I expressed my opinion in the March number. I should like a good discussion on this subject. Personally I do not know any women like those mentioned in the letter save those who live under oppression and are subjected to the whims of tyrannical husbands. It is the over-worked woman as a rule whose mind is too tired to reason. I was born and brought up on a farm and women as I know them are ready and willing to listen and can comprehend reasonable explanations. Many times I have seen my mother go to town, willingly, to sign papers that my father wanted for a loan or for the sale of a piece of land.

Since all of eastern Canada except Quebec, Great Britain, and the United States have a dower law, and it has proved successful, I do not understand why Western Canada should stand alone in regard to the neglect of the rights of wives. It seems an injustice. However, let us have both sides of the question discussed in these columns and we shall therefore be able to decide more intelligently.—P. R. H.

STOLEN KISS MAKES SUFFRAGETTE.

The devotion of Carrie Chapman Catt to the cause of suffrage may be traced, according to her own story of her early life and struggles, to a kiss. An unprincipled kiss it was, snatched ruthlessly.

When Mrs. Catt's first husband died she was still an extremely young woman and a decidedly pretty one, those who knew her say. She went to work to earn her living in the business world of a western city. One wintry day when it was cold, stormy, and late, her employer asked her to go to the office of another firm to collect some money that was due. Wrapped in a rain coat and blown about by the storm that was rising, Mrs Catt went cheerfully on her way, rather enjoying the weather. Before she had quite completed the way of her destination, red cheeked and becomingly disheveled, a masculine wayfarer of predatory character intercepted her and snatched a kiss from under the shelter of her storm coat and umbrella. Mrs. Catt retreated from the building where she did her errand with streaming tears and rising rage.

"I realized it all then," she said, "that whatever immunity the weaker sex has in the matter of being taken advantage of by the stronger is a matter of protection and prestige.

"No such thing had ever happened to me before, because I had position and somebody to take care of me. But the first minute it was taken away from me and the fact was revealed by the errand which led me to push my way into that office on that stormy night I did not receive respect because of my womanhood. I resolved then and there that women could not have any too much protection and that the ballot was the most logical and should be the most available. From that minute I became a suffragist."

FANNY CROSBY.

Fanny Crosby, the blind hymn writer is still living. She is now ninety years old. Her life now is spent in a golden sunset, with little regret and much for which to be grateful.

In almost every religious gathering one or more of her compositions are sung. Among her best known hymns are: "Only a Step to Jesus;" "Pass Me Not, O Gentle Saviour;" "Jesus Keep Me Near the Cross;" "To the Work;" "Blessed Assurance;" "Rescue the Perishing;" and "Saved by Grace." Her favorite hymn is "Safe in the Arms of Jesus." She says of this hymn: "It came to me in fifteen minutes, and I have never dared to change a word of it. I went to my room and shut the door and knelt down and prayed. I always prayed over my hymns in writing them. This hymn came at once; I cannot hear that hymn read without crying; it means so much to me." She gives an interesting account of the origin of this hymn: "One day Mr. W. H. Doame, who composed much beautiful music, came to me hurridly and exclaimed:

"Fanny, I have just forty minutes to catch the train; during that time you must write me a hymn and give me a few minutes to catch the train."

He hummed the melody and in fifteen minutes I gave him the words of the hymn 'Safe in the Arms of Jesus.'" The hymn is now sung where ever Christian music is known. Fanny Crosby has composed over eight thousand hymns. She has written as many as seven in one day.

She is blind yet she says: "I'm the happiest soul living."

Wheat as an Ornament.

Wheat is not only used freely as a trimming for hats, but is now being worn as an ornament in milady's coiffure. It is not probable that it will take the place of the aigrette in popular liking, but it is pretty and fanciful.

A BABY CONTEST.

A good way to make a party cheerful and informal is to introduce a baby contest. Each guest must bring the very first picture taken of himself or of herself and the hostess must arrange these around the room. Then each guest is to guess who the various babies are—it is not an easy task—and the one who makes the best list wins.

Sunshine Bag for Invalid.

It is hard to find anything that will give as much pleasure to an invalid or shut-in as a Sunshine bag made as follows: Make a bag of cretonne or other bright material, which may afterwards be used as a handkerchief bag or small laundry bag and fill it with a number of little gifts prepared by different friends. Tie the packages with bright colored ribbons and leave one end of each ribbon about half or three-quarters of a yard long, so that it will hang out of the bag. Each day one ribbon is to be pulled and the gift at the bottom opened. Try to have at least thirty, so that the bag will last a month. Aside from the pleasure of receiving the gifts the excitement of having this little treat each day for a month is a welcome break in a monotonous life. Gifts will readily suggest themselves. Among the most acceptable are books, candy, photo-prapgs, soap, toilet water, small tolet articles, slippers, neckwear, handkerichiefs writing material, etc.—M.D.M.

Dangers of the School-room.

As I have visited many country schools, I have wondered why teachers and pupils and the school officers are not more careful.

In many places sanitary school conditions are in effect, but in a number of schools there is yet room for improvement, and some of the things are so important for the welfare of the children that if the School Board does not change conditions the parents should look after it themselves. The drinking cup is a subject of much concern and where there is a common drinking cup from which sick and well, clean and unclean, drink a mother should have her eyes opened to the dangerous facts and learn of the harm lurking in the unsanitary drinking cup. Many schools require individual drinking cups, and if this modern improvement is not installed in the school where your children attend, their example should be followed.

Another way of scattering disease is by children lending their lead pencils to each other. Many children when writing put pencils in their mouths. If loaned to another child he will do the same thing. Why do parents allow this carelessness?

In taking apples and candy to school children should not be allowed to eat after each other. One day the teacher stepped out of the room for a few moments and in her absence the principal opened the door of the school-room. There sat one child with a stick of candy holding it out to each child within reach for a 'suck.' It was amusing to see their generous fun, but a subject for serious thought after all. Children should be taught the dangers of eating and drinking after others when quite small, that they may avoid these happenings.

A child with a cough or cold should be placed apart from the others as much as possilbe, and if in a draught should ask the teacher to allow a change of seats, which is always permissable. The teachers try to regulate the heat of the schoolrooms as best they can for the convenience and health of all, but children should be taught to speak if too hot or too cold, or if they get their feet wet should ask to be excused and go home and change their shoes. Even girls too old to be so foolish have been known to catch severe colds by sitting hours with wet skirts about their ankles.

It is a parent's duty to guard a child's health in every way, and if we are careless in our teaching it may cause as a heartache in years to come. We may be called "cranks" for speaking of these things, but we are dealing with facts.

The Mother's Corner

Some women long for honor and for fame,
Applause of men, the fickle world's acclaim:
They'd paint a masterpiece or write a book,
For glory such as this I do not look.
My little one's my book.

And some Ambition calls to build a name,
And lures them onward with the hope of fame:
Worn out and weary still they toil, alone.
A better work by far I'd make my own
I'd rather build a home.

—Mable Wilfong Brewer.

Baby's Bath.—Fold a thick towel and put it in the bottom of baby's bath, and you will see how delighted the child is with it. Timid babies lose all fear when they find that they do not slip about.

From the start care should be given to the cleansing of the child's mouth. The mouth should be cleaned two or three times a day. It is good to keep on hand a solution made by warm water and all the boracic acid it will dissolve. This solution makes a mild, soothing lotion for washing out the baby's mouth. It is a cleansing, cooling wash to apply to any little sores or scratches. It also makes excellent eye wash for children and adults.

No matter how much baby takes of milk or food during the day, it needs water many times beside. Milk does not satisfy the thirst for any period after taking it. Milk, if cold, seems to relieve the thirst, but when it is digesting it draws on the fluids of the body and additional fluids are necessary. Many mothers permit their children to suffer for water, taking it for granted that because the child has milk it will not need or want water: It is such a uselessly cruel thing for a mother to let her child suffer for water many times a day. If baby takes only a spoonful, give that, and remember to give it another in a short time. Children should be trained water drinkers from the cradle.

A girl who is unloved in her home will be completely metamorphosed under the influence of a loving and lovable influence. Young people are very often but the reflection of older ones among whom their lives are cast. Children are often but little sensitive plants, and certain elements may exercise upon them the most irritating and disastrous effects.

A good dish for children is baked milk. Put the milk in a jar and cover the opening with white paper. Bake in a moderate oven until thick as cream. If the oven is too hot put the jar in a pan of cold water. Milk prepared in this way can de digested by the most delicate stomach. A little sugar and flavoring can be added when the milk is done.

A mother had a little girl who was given to frequent spells of bad temper. The usual punishment that the mother resorted to was to send the child to her room; but the punishment was ineffective, as the little girl's temper commonly gave place to moroseness. Finally the mother, coming to believe in the moral influence of pictures, bought a good engraving of one of Raphael's Madonnas and hung it in the little girl's room. She did not tell the child anything about the religious significance of the picture, however. The usual punishment that the mother provement in her conduct was noticed. But one day the old habit asserted itself.

"Go to your room," said mother.

"Oh! I can't I Can't! Please don't send me there!" pleaded the little girl penitently. "I don't want my Lady to see me when I'm naughty."

The Need.

By Zelia Margaret Walters in Mother's Magazine.

A mother who had to be mother and bread winner both for her child, had often to deny the child's request, saying, "Mother hasn't time now. She must write to earn bread and butter and shoes and stockings for you."

One day the little girl responded with one of those amazing speeches of wisdom that so often fall from the lips of babes:

"I don't want just bread and butter and shoes. I want my mamma to play with me.'

Mothers are constantly denying the children their companionship because of the multitude of little things in life that must be attended to. But the children, if they could voice their real needs among the first things, and let much baking and cooking and cleaning and sewing done for us, and we do need our mothers."

No one can doubt that the mother and housekeeper has her hands full. Too often she has more than she should do. But we know that time can be always found for the absolutely necessary things. Why not put the children's needs among the first things ,and let the less important fall into line behind?

In almost any home the hour after the evening meal could be kept for the children. The careful housewife may exclaim in horror at the thought of setting the dishes away to be done the next morning. But let the mother consider how much good that hour of song and story and confidential talk and counsel may do for her growing eager, adventurous boys and girls. How lightly and thoughtlessly they go into their untried ways! And what may come to them if mother has forgotten to be companion and counselor! Surely the children's hour is the most important in the allotment of mother's time.

Discipline.

Binks had sent Mrs. Binks on a visit to her mother, and he was on the job with the six months' old baby.

In the night the baby awoke and cried. Binks looked at his watch—three-quarters of an hour till bottle time. He said to himself:

"Let him yell. He's a healthy little Indian, and he must be disciplined."

Then Binks tried to sleep.

But Binks couldn't sleep. Every cry grew more pathetic, and abused and heart sick and discouraged. Each cry said more and more plainly: "I have no friends or relatives. I'm unhappy and uncomfortable and want someone to be good to me."

But Binks, the stubborn and stiff-necked, stuck it out, though each cry stabbed him clear through.

Finally (maybe he set it forward a bit—who knows?) Bink's watch announced the arrival of bottle time. He went to the ice-box for the food, heated it and took it to his now faintly sobbing infant son.

But the infant son could not take the bottle. He choked on the first swallow, then put up his hands and renewed his wordless plea to the big man he could see dimly through his tears.

Then that father said, "Discipline be hanged!" Maybe though, it wasn't "hanged" he said, but the vowel sound is right, anyway.

He took up the baby, and the baby stuck to his daddy like fly paper. Further attempts to lay him down were futile. He wanted no food but heart food, no milk but that of human kindness. So the big man laid that baby beside him on the pillow; the baby put one rose-petal hand to his father's stubby cheek, gave a long, quivering, satisfied sigh and slept for six unbroken hours.

As Binks lay there, afraid to stir lest he disturb the little one and feeling like a horse thief because he had let the love-hungry infant cry his heart out, he repeated frequently:

"Discipline be hanged!"

About Women

Lady Jenne writes regarding Queen Alexandra: "The most delightful sight at Sandringham was to see the Queen and her grandchildren during the time when the Prince and Princess of Wales were away on their journey to the colonies. The little princes are devotedly attached to the Queen and were her constant attendants in her walks. Nothing seemed to give the Queen more pleasure than to walk about the room with a baby prince in her arms talking and singing to him, and devoting her whole attention to his amusement."

FOUR WOMEN LAWYERS.

The city of St. Paul has four women lawyers, all of whom are said to be doing a prosperous practice. Miss Irene C. Buell, one of the legal quartet, took down her account book when twitted by a mere man lawyer at the end of a month recently and showed that she had made $500 that month. The man capitulated. He had earned only $260. Miss Buell, strange to say, inclines toward practice in the criminal courts. She says women don't like to employ women lawyers, while most of the men are skeptical as to their ability until by hook or by crook they get a chance to show their mettle. Miss Essie W. Williams, on the other hand, says some of her best clients are women. In her graduating class she was the only woman, there being twenty-one men. She had a hard time getting a place in a law office, though finally she found an established man lawyer who was willing to give a woman a chance. Miss Anna Lambert has been practicing about a year. She also does a considerable business in abstracts. That seems rather a dull line for a woman to take up, but Miss Lambert says she fourth in the St. Paul quartet is the doesn't mind so long as it pays. The veteran of them all, Mrs. M. D. Smith. She has been in active practice two years.

Thirty-three years old and the mother of three small children, Mrs. Anna Jacober, a widow living in Chicago recently graduated from high school. This unusual circumstance was revealed recently through a benefit performance given by a dramatic society composed of school-mates of the mother, but unknown to her. The proceeds will be used in paying the tutition of Mrs. Jacober to the Chicago Normal school, that she may carry out her plan to become a teacher and place herself in a position to better support her children. The woman's husband committed suicide last year. While attending school she supported herself and children by taking in boarders. She gets up at 4.00 a. m. and does her housework before going to school. She completed the four year's course in three and one-half years.

Miss Belle Kinney of Nashville, Tenn., is to receive $10,000 from the Confederate Vererans for her design of a monument to the women of the Confederacy. A replica of the statue will be placed on the capitol grounds of each Confederate state. The statue is to be of bronze, eight feet in height, and it represents the Goddess of Fame placing a wreath on the head of the Confederate woman, who is reclining and extending to a lying Confederate soldier the palm branch of victory.

Experience Extracts.

Lemons are so healthful, and are useful in such a multitude of ways that the home should never be without them. Lemonade is the best of all drinks in fevers; without sugar it is a fine remedy for rheumatism and one of the safest of anti-fat cures; for a sick headache the juice of half a lemon in a cupful of strong black tea or coffee, without sugar will often prove better than medicine.

A little household ammonia put in the water from time to time when cleaning glassware will make it very clear and almost as sparkling as cut glass. A perfectly clean linen towel should always be used to polish glassware.

To remove mildew, wet the cloth in soft water and then rub on plenty of soap and salt, hang on the line in the sun and air for a day or two. This is an infallible recipe.

Tomato soup is so easily made and so generally liked that it is frequently resorted to for an unexpected guest, and occasionally the cook is much chagrined to find that the tomatoes and hot milk separate when poured together. This will never happen if one remembers to pour the hot milk into the hot tomatoes and not the tomatoes into the milk.

Ants in the pantries are a miserable pest and one that the most careful of housekeepers seem powerless to prevent in certain seasons. One of the best ways to get rid of them is to place fresh cucumber-peels around the places they infest. These must be fresh, as it is the odor that drives away ants; fresh peels night and morning for two or three days will often clear them out thoroughly.

Be very careful about the face veils you wear. Face veils are injurious to the eyes. I shudder when I see a face veil over the face of a baby—especially a knit veil. Mlle. Martinovski, a most beautiful young woman, recently lost her eyesight because a blue face veil which she wore caused blood poison. The dye in many fashionable veils is poisonous. Face veils are injurious to the complexion.

I heard a doctor say last summer that the chipped pieces of enamel from cooking dishes cause much of the present stomach trouble. The pieces must get into the food so one should use enamelware very cautiously.

When Cream will not Whip

I was making a shortcake and wanted it extra nice in honor of my husband's birthday and some guests who were going to help celebrate. It was a great disappointment to me when I found that the cream that had been sent me would not whip. I had about given up trying to make it when one of my guests came out and I told her of my dilemma. "Don't tell anybody," she laughed, "and give me the white of an egg I'll beat your cream for you and nobody will know of your difficulty." She dropped the white into the cream and in a moment had beaten the two together with the egg beater. It worked like a charm.—Mrs. C. F. Streeter, of Michigan.

Never press a fur-lined coat. It will ruin the skins. Take a very wet sponge and go over the garment thoroughly if it has become very wrinkled. Then hang on a form in the open air. It will look like a new coat when dry.—J. W. H.

To clean a net waist put it in a two-quart fruit can filled with gasoline. Be sure that the top is well screwed on. Let it stand overnight. In the morning shake the can back and forth. The motion will churn the dirt out of the waist. Sometimes, if the article is very soiled, fresh gasoline must be used in the morning.—L. S.

A Bag Instead of a Clothes-Basket.—A laundry bag is a great improvement over the basket commonly used when taking clothes from the line. It can be made from two yards of heavy unbleached muslin. Make a deep strong hem at the top and fasten two hooks made of wire and shaped like ordinary dress hooks, about eighteen inches apart on this hem. When taking down the clothes the bag is hooked over the line and can be easily pushed along as the clothes are removed. There is no lifting, dragging or stooping.

If, on account of dampness, frost or wind the clothes are not as stiff as desired, sprinkle with a weak cold-starch instead of water. Roll up and do not iron for a few hours. They will be found nice and stiff and will iron with a gloss.—Mrs. A. M.

Old stocking legs are excellent to pull on over furniture legs first covered with excelsior, when packing to move.

Recipes

TOOTHSOME CHICKEN DISHES

Chicken Salad

When stewing a large fowl, or hen, it is a good idea to save out a part of the white meat to use later for making salad. If the meat is kept in a cool place, it need not be used for a day or two. Take two cups of white chicken meat, discarding bones and skin, and chop moderately fine. Cut celery into small pieces, and add to the chicken. Season with salt, and pour over it a mayonnaise dressing made as follows: To the yolk of one egg add one-half teaspoon each of salt, sugar and mustard. With an egg beater, beat into this one cup of olive oil and two tablespoons of lemon juice or vinegar. If mayonnaise is not liked, a cream dressing may be used. To make this, take one well-beaten egg, two-thirds cup of sweet cream, one-half cup of vinegar, one-half teaspoon of mustard mixed with a little cod water, one-fourth teaspoon of pepper, one level tablespoon of granulated sugar, and one heaping tablespoon of butter. Add the cream to the beaten egg, then put in the mustard, pepper salt, and sugar. Stir constantly, and add the vinegar gradually, then put in the butter, and cook in a double boiler until it thickens. The dressing should be cold when added to the chicken.

Roast Chicken

First of all be sure the chicken is perfectly fresh. Cold storage poultry is unfit for anyone to eat. Singe the chicken, remove all pinfeathers, and wash and wipe dry. Take three teacups of dry bread crumbs, add one teaspoon of powdered sage, a tiny pinch of ground allspice, salt and pepper to taste, and moisten with hot water. Add one teaspoon of baking powder. Stuff the chicken, sew up with twine that has been washed in hot water, and place in a self-basting pan. Place three thin slices of salt pork on the chicken, and bake until tender. The length of time will depend on the age and size of the chicken. If there is more dressing than will fill the chicken, tie the remainder up in a muslin cloth, and lay in the pan with the chicken. Cook the giblets on top of the stove, chop fine, and add to the gravy in the pan after the chicken has been taken up. Thicken the gravy with flour.

Baked Chicken and Sweet Potatoes

Divide the chickens in halves, lay them breast down in a baking pan, and place in each depression a thin slice of salt pork. Pour into the baking pan one teacup of hot water, and pile sweet potatoes, which have previously been boiled and peeled, around the chicken. Cook in a hot oven for three-quarters of an hour, turn the chicken and potatoes, and cook half an hour longer. Take up the chicken on a large platter, and pile the potatoes around it. Thicken the gravy with browned flour, and serve with the chicken.

Broiled Chicken

Quarter the chickens. Place an iron spider over the fire and allow it to get very hot. Wash and wipe the pieces of chicken, and drop them into the hot spider, skin side down. No fat of any kind is needed. Season with salt while cooking. Allow the pieces to brown slightly, then turn, cooking first one side and then the other until tender.

Chicken Croquettes

Chicken left over from the day before can be used for croquettes. Take two cups of finely chopped chicken, add the same quantity of dry bread crumbs, one level teaspoon of powdered sage, salt and pepper to taste, and moisten with chicken gravy. If no chicken gravy. If no chicken gravy has been left, hot water will do. Shape into croquettes, dip first into beaten egg, then into bread or cracker crumbs, place the croquettes into a wire basket, and fry in deep fat until brown.

Chicken Pie

Yearling hens make the best chicken pie. Fat hens are preferable. Chicken pie is just as good warmed over the next day, so two hens are not too much. Unjoint them, cut them up, and remove part of the fat. This fat can be tried out and used in various ways to take the place of butter. Put the chicken over the fire with enough water to the dough onto the molding board, and roll out into a large, round sheet, half an inch thick. Grease the chicken pie dish, one of stone ware is preferable, fold the dough over in half, and with a quick, deft movement, slip it quickly into the dish. If the dough has been made stiff enough, this can be done easily, and without tearing the dough to pieces. Turn the folded half back, and press the dough around the sides of the dish. Then moisten the edges. Roll out the remaining crust, spread with slightly warmed butter, fold toward the middle, and roll out again. Thicken the chicken with three tablespoons of flour into which one teacup of sweet cream has been stirred gradually, let it boil up once, and turn the meat and gravy into the chicken pie dish. With a small biscuit cutter, cut three holes in the centre of the top crust, place it over the chicken, and press the sides together. Bake in a hot oven until golden brown, which will take about an hour.

This receipe of cookies was given me by a friend who is a splendid cook:

Three cups fine oatmeal, two cups flour, one cup shortening, one cup brown sugar, one teaspoon cinnamon, one-half teaspoon soda melted in a little hot water.

To Cook Greens.

Place several slices of bacon in a quart of water to boil. Clean the greens in several waters. Place them in a large dishpan and cover with scalding water in which there is a teaspoonful of soda. This will remove the wild taste. Rinse and place in the water with the meat. Cover and boil until no liquor remains in the vessel. It may be necessary to add water from time to time. Serve pickles with greens.

Rhubarb Gelatine.

Cook rhubarb and run it through a sieve. Sweeten it to taste, heat and add a box of gelatine already dissolved. Stir ingredients and pour it into a shallow pan. When cut in slices it is very nice to serve with any cold sliced meat. It makes an excellent fish garnish.

Canning Rhubarb.

It is a good plan to can rhubarb when it becomes cheap. It can be boiled and sealed in a glass without adding sugar. Later it is useful in forming the bulk of acids and butters. It is very nice to mix with berry jellies, and imparts the desired amount of acidity in plum, cherry and peach jellies which often turn to a thick, stringy syrup and will not jelly without acid. Slender rhubard is finer grained than very thick stalks, and requires less sugar to sweeten it.

Potato Squares.

Into enough left-over mashed potatoes to serve four persons, mix one whole egg well beaten. Season the potatoes just a little more as a second heating weakens the former seasoning. Mix in sifted flour until the mass can be handled and rolled out with a floured rolling pin to the thickness of a third of an inch. Cut in squares and fry on a greased pan-cake griddle. Turn when the one side has browned. Serve extremely hot.

Domino Cakes.

Take one cupful of sugar, one cupful of sweet milk, two cupfuls of flour, one egg, two tablespoonfuls of butter, two teaspoonfuls of baking powder. Flavor to taste with lemon, vanilla or bitter almond extract. Bake in a plain cake in shallow biscuit pans half an inch deep. When cool cut into small oblong pieces, the shape of dominoes, but a trifle larger. Cover the top and sides of each piece with hard white icing. When this is hard enough, draw the lines and dots of dominoes on the top with a camel's hair brush in chocolate icing.

Cocoa Wafers.

Cream half a cupful of butter with three-fourths cupful of sugar. Add one beaten egg and one-fourth cupful of sweet milk. Sift together with two cupfuls of flour, one-fourth teaspoonful of salt, two teaspoonfuls of baking powder, four teaspoonfuls of dry cocoa, and one teaspoonful of cinnamon. Combine wet and dry mixtures. Bake fifteen minutes in hot oven.

Cherry-nut Salad.

For a tasty salad, place large preserved peaches on lettuce leaves in individual dishes. Fill the cavity left by the peach stone with shredded almonds or hickory nuts. Add a few cherries and pour a spoonful of mayonnaise over the nuts. While this recipe calls for preserved peaches, the dessert is often made with fresh fruit when in season.

Lenten Salad.

Place several leaves of lettuce on each plate and lay a thin slice of Bermuda onion on top. Pile in the center of the onion a large tablespoonful of chopped celery and beet mixed with mayonnaise. The celery and beets may be separately chopped and pressed into a cone with red base and white top.

Salmon Souffle.

Separate one can salmon into flakes, and season with salt, paprika and lemon juice. Cook one-half cup soft stale bread crumbs in one-half cup milk ten minutes, and add to salmon; then add the yolks of three eggs beaten until stiff and dry. Turn into a buttered dish and bake until firm.

Springtime Cake.

Two cupfuls of sugar, one-half cupful of butter, whites of four eggs, two teaspoonfuls of baking powder, three cupfuls of flour, one teaspoonful of vanilla, one cupful of sweet milk or woter. Cream the butter and sugar, then add the water, two teaspoonfuls of baking powder and a pinch of salt sifted through the flour. Add your other ingredients, folding the eggs in the last thing. This can be baked in a dripping pan and cut in squares or layers and baked as a layer cake. For the filling or frosting take two cupfuls of new maple syrup and boil until it hairs, then add the whites of two eggs well beaten. When the syrup is thoroughly cooked put in a teaspoonful of vanilla. Then pour the cooked syrup over the eggs, beating constantly. Stir until almost cool then spread over the top of the cake, or use as a filling for a layer cake, as desired.

Finnan Haddie with Cheese

To a Scotchman the only correct way to cook a haddie is as follows: Put the fish in a baking pan and pour over it a cupful of milk, then put on the stove where it will come to the scald very slowly. When the liquid begins to simmer pour it off, then dot the fish with bits of butter and a shaking of white pepper and bake in a quick oven for half an hour.

Baked Finnan Haddie.

But in spite of the Scotchman's decision this recipe has also a large number of advocates. Pick sufficient haddie into small pieces to fill a pint measure, then mix it with a sauce made of a tablespoonful of butter, one of flour and a pint of milk. Let this simmer until creamy then remove from the fire and stir in the well-beaten yolks of two eggs and a heaping tablespoonful of grated cheese. Serve on thin slices of toast or in ramekins with toast fingers and sliced hard-boiled eggs as accompaniment.

Haddie may also be broiled, then buttered and served with lemon quarters, or it may be picked up in cream like salt cod-fish. As the large haddies are the fattest, it is better to purchase half of one of these rather than a whole small one, also if the fish dealer permits, take the side without the centrebone.

Fashion Fancies

THE BLACK DRESS.

Women often have an idea they can not wear black, but it is safe to say that any woman can wear black; if not all black, at least black toned with lace. Some of this season's best styles show patterns demonstrating this fact, with laces brought down on each side

the bodice front and across, to form not only a yoke, but a drapery outline on the bodice. One can use several yards of lace without cutting it by draping the dress material over the lace in places.

BLOUSE MATCH GOWNS.

The blouse to be worn with any skirt should seem as much as possible a part of it. The day is past when any kind of a shirt-waist might be worn with any kind of a skirt. A well-dressed woman nowadays selects her blouse for a particular skirt, and a favorite style is the waist of net, either plain or figured, of the same color as the skirt. Often a touch of the skirt material is added to the waist, and this makes it seem even more a part of the costume. To perfect the scheme there should, of course, be a coat of the skirt material; but this is not essential, although much more stylish than any other coat would be.

The vogue of colored parasols with black linings exemplify the fact that it takes a black shade, after all, to protect the eyes.

The New Waists.

The new waists are different in that they are made with surplice effect over the girdle—not only in the front but often in the back. The variety is endless and there is something chic about every style. There is one cut in one piece, seamed under the arms and fastened down the back. It is collarless and a pretty bertha decorates it around the shoulders. The sleeves, which are half length, are slightly fitted and trimmed with backward turning frills. This is one style which calls for tulles or lingerie frills, provided the bertha is not used. This style of waist, in its numerous variations, may be carried out in other materials and plaited chiffons used for the decorations.

The Spice Box

Did He?

"Does this gown match my complexion dear?"

"Which one, love?"

"Wretch."

"I meant which gown, darling!"

Never put your knife in your mouth. If there is no room on the table for it, then balance it on the shoulder of the person next to you.

The less a hat looks like one the better a woman likes it!

Often it is difficult to distinguish between a sympathetic person and a curious one.

It is hard for a girl who marries a good-looking man, for he will monopolise the mirror.

An Englishman and an Irishman went to the captain of a ship bound for America and asked permission to work their passage over. The captain consented, but asked the Irishman for references, and let the Englishman go without them. This made the Irishman mad, and he planned to get even.

One day, when they were washing off the deck, the Englishman leaned far over the rail, dropped the bucket and was just about to haul it up when a huge wave struck and washed him overboard. The Irishman stopped his scrubbing, went over to the rail and seeing that the Englishman had disappeared, went to the captain and said: "Perhaps yez remember whin I shipped aboard this vessel, ye asked me for riferences and let the Englishman come on without thim?"

The captain said: "Yes, I remember."

"Well, ye've been decaved," said the Irishman; "he's gone off wid yer pail."

THE Girls' Cosy Corner

DISAGREEABLE STREET.

By Rebecca D. Moore.

There is a little girl I know
Who sighs and whines and cries, "Oh, oh,
My latest doll has eyes of blue
Instead of brown, what shall I do?"
I hope this child you'll never meet—
She lives on Disagreeable Street.

There is a little girl I know,
When mother calls, she doesn't go,
But says, "Oh, let her come and look,
I've got to finish my new book."
I hope this child you'll never meet—
She lives on Disagreeable Street.

There is a little girl I know
Whose playthings she will never show,
But keeps them hid upon the shelf
Unless she's using them herself.
I hope this child you'll never meet—
She lives on Disagreeable Street.

"If there were no birds man could not live on the earth, and birds are decreasing in this country."

ENGLISH SPARROWS.

They chirp in the crest of the beautiful elms,
They perch and they cling and they sway;
And they tell again the story
Of Old England far away.
They tell of the shores so sunny and fair
Where the blue Atlantic drones;
And a summer dream comes in, perhaps,
As the wind of winter moans.

Oh, there in the street in the sun or the sleet
We see them, a brown-breasted throng;
And we list and we hear the cheet, cheet, cheet,
In the note of their sweet treble song.
They are telling, methinks, of the home they have found
O'er the blue of waters afar;
How they spread the brown wing to the song they would sing
In love to the white western star.

To the blossoms that cling to the low cottage wall,
They come for a time of repose;
And they sleep till the dawn, till the shadows are gone
From the red of the sweet briar rose.
They are under the eaves of palace and cot,
They are under the love of your heart;
They are under the guidance of God, who has sent
Them into the field and the mart.
—Rev. Leslie Clare Manchester.

My Dear Girls:—You are writing splendid letters to us. I am sure the games that are sent in will help you in your play. It is hard for me to award the prize. If I had my way I would give a prize to every girl. I have sent all of the prizes up to date and I hope every girl who was awarded a prize will let me know by a postal card as soon as she receives the book. There is one prize I have not sent—that is to the girl who did not sign her name in the January number. I requested her to send her name and she did, but I have lost it. If she will be kind enough to send it again, I will send her book by return mail. I do not want anyone to miss her prize book.

I will give you two games this month.

THE ENTERTAINMENT BALL.

Make a huge ball of tape, or if this is not at hand, of strips of rags sewed together as if for rag carpet. Write the names of all those who will attend the party on slips of paper and wind them into the ball at random. The bigger the ball the funnier the game, so make it as huge as possible. When the game is to begin, the ball is slowly unwound until somebody's name drops out. This person then begins a story, inventing it as he unwinds the ball. When another name has been reached this second person must take up the narrative at the point where the first player left it and continue it until a third slip is dislodged. This continues until the end of the tape is reached, the last player finishing the story.

NONSENSE ART.

When a really hilarious drawing contest is wanted, make as many slips of paper as there are guests and on each slip write some nonsense subject as a goop, a bird's-eye view, a disembodied spirit, a figment of the brain, a purple cow, a blood-curdling yell, an optical illusion, etc. Fold the papers, pass them around in a basket and let each draw one. Have a number on each slip. This number indicates the order in which each man or girl shall proceed to the blackboard and illustrate the subject he or she has drawn to the delectation of the company.

How many girls are planting gardens this spring?

Let all of the girl readers write to this department.

Sincerely,
Cousin Doris.

GIRL'S PRIZE LETTER.

Desford, Man.

Dear Cousin Doris:—As I have read so many letters, I thought I would write again. I most always read the stories in the boys' and girls' page and I think they are very nice. I think I have read about four or five books. They are: Lake of the Wood, Under the Lilacs, Kriss Kringle Stories and Buster Brown. They are all nice books. I am going to tell you what my favorite game is—Stealing Sticks. First you choose up sides, then you put a row of sticks on the ground and then get an even amount of sticks on each side, about 100 feet from the middle; then start and play, and if a person on one side is touched by one on the other side, he has to stand on a stick off a piece from the middle, and there is one watching him and there are some trying to get him out, and whichever side gets all the sticks has the game. We play it a lot at school in the summer. I have three miles to go. I walk most all the time in the summer and in the winter my brother Kenneth and I drive. Our school's name is Wood Lake and our teacher's name is Miss King. I am in the Fourth Reader. My studies at school are reading, writing, spelling, arithmetic, geography, history and drawing. I like going to school. I think I will have to stop or I will have taken too much room up in your paper. My brother takes the Canadian Thresherman and likes it fine. He has taken it for a good many years.

Wishing your paper every success,
Your loving cousin, Violet Scott.

Dear Cousin Doris.—As my last letter was in print I thought I would try my luck again.

Thank you very much for the lovely book which I received, entitled "Adam Bede." I read it through in a short time.

The weather has been remarkably fine in this part of Ontario all Fall and Winter but people are saying there will be a rough February. I hope not as I cannot go outside in rough weather. It is raining at present and by the sound I guess it will keep up for a while.

I was not very well all last year as I have Goitre on my neck so I cannot go to any place of amusement and I find it very lonely often as I am very fond of dancing and other amusemnts. Some may think it is wrong to dance but I do not see any harm in it.

I read a good deal now as I am very fond of it. I am reading an interesting story which is running in the Family Herald and Weekly Star. It is very amusing and is entitled "Anne of Green Gables."

I would like very much to correspond with any of the members of my own age (16) and would answer all letters promptly. I am also collecting post cards and will exchange with any one. I have about three hundred and fifty.

I hoped all the cousins fared well at Christmas. I got thirteen gifts, including a gold locket and chain.

I think my letter is getting too long so will close, hoping to see it in print, I am, your loving cousin, Annie Contryman, Bush Glen, Ont.

I hope some of our cousins will write to Annie. I have read Anne of Green Gables, also Anne of Avonlea which is the sequel. I wish all of my boys and girls could read these two books. I am glad you are reading it Annie.

C. D.

Dear Cousin Doris.—This is my second letter to you. I was very much pleased to see my first letter printed in the Canadian Thresherman as the girls' prize letter for February.

Last time I wrote I was living with my Grandma and uncle and auntie. I helped my auntie put in a large garden and plant a lot of small trees and they are all growing good now. I like putting in a garden and like to eat it when it grows to. I am home now and going to school again, but we will soon have holidays and I am going to a Foresters' Picnic on July 1st and hope to have a good time there. I hope my letter is not too long for you. I remain, yours truly, Maggie I. Powery, Basswood P.O.

Dear Cousin Doris.—My brother has taken the Thresherman for over two years and he says there are a great many things very useful to a thresherman.

I live on a farm seven miles from the town of Wapella and about twelve miles from Moosomin.

I think that farm life is better than city life, though I have never lived in a city.

The nearest school is two miles from our place. I am in the fourth book and my studies are reading, spelling, grammer, geography, history, composition and drawing.

I am very fond of reading and my favorite books are the Pansy Series. I have read Aunt Jane's Hero, Little Women and The Lamplighter. gives to the girls are very useful. I must close now. Hoping to see my letter in print. Yours truly, Lillian E. Fenwick, Wapella, Sask.

THE Canadian Boys' Camp

UPS AND DOWNS.

Johnny's cryin': do you hear him?
I don't see why he should cry!
Jus' because we two went coastin';
On the hill there, he an' I.

Got a lovely sled las' Chris'mas,
Papa gave it, painted red.
"Let your little brother use it
Half the time"—our mamma said.

An' I did. I only used it
Coastin' down the hill, an then
Every single time I let him
Drag it up the hill again.

An' it took him so long climbin'
That he had it most—he did.
An' yet there you hear him cryin'!
Isn't that just like a kid?
—St. Nicholas.

TWO BRAVE BOYS.

Two Texas boys, Gordon and Lon C. Hill, Jr., brothers, have made a fortune for themselves before either has reached his majority. Gordon is now twenty years of age and his brother nineteen. Their experiences recall the hardships and trying times which the early pioneers of the United States went through. These two boys were left motherless when small. They lived in the ranch region of Southern Texas and before they had entered their 'teens they were expert in handling horses, herding cattle and the many other things that ordinarily fall to the lot of an average cowboy or ranch hand. When Gordon was fourteen and Lon thirteen their father went to the wilderness of the lower valley of the Rio Grande, which stream marks the boundary between Mexico and Texas. At that time the nearest railroad point to the scene of Mr. Hill's home was 165 miles. Afterward he sent for his two sons and four young daughters to come to him. These children left the railroad at Alice and made the trip of 165 miles through the wilderness of mesquite and chaparral in a two-horse wagon which the boys took turns about driving. Only one house was situated on the long route. It was a hut which was occupied by a Mexican family. The courageous children who made this long over-land trip camped out at night. The howls of the wolves and coyotes had no terrors for them. When they reached their new home Gordon and his brother set to work clearing the chaparral from the rich valley lands. They made many long trips in wagons and on horseback to railroad points after supplies and freight for themselves and neighbors who began to come into the new country. A year or two after a new railroad was started and the two boys obtained employment upon this road and worked on its construction. In twelve months they had saved eight hundred dollars between them. They invested this money in land and in five months land values had enhanced so greatly in that territory that they were able to sell their holdings at a profit of five thousand dollars. They made other investments in land and were soon doing a brisk business in buying and selling farming tracts, making a handsome profit on each transaction. All this time they were at work in different industrial projects that paid them well. The rich valley began to attract the attention of captalists and enormous irrigation projects were set on foot. Gordon and Lon obtained contracts for digging canals and ditches. When only eighteen years old Gordon was the boss of five hundred Mexican laborers working for him on canal construction. Lon operated freight teams and did other work which paid him fairly well. The two boys purchased a farm of on hundred acres which they have placed under irrigation and are raising winter graden truck on a large scale. Their land is valued at $150 per acre. They have other holdings of valuable property and are worth more than $100-000, all of which they have made during the last six years. During the time they were doing the work of pioneers in the chaparral-covered region they devoted what little spare time they had at night to studying. In the fall of 1908 they passed the entrance examination of the state university of Texas and are now students at that institution at Austin. During the several years that they spent in the wilderness along the border they became expert deer and wolf hunters. They are both crack shots with the rifle and pistol.

To the boys in our camp:

I am so glad to know you are not letting the girls get ahead of you. We want our Boy's Comp to contain just as many interesting letters and as many as are in the Girl's Cozy Corner. The letters from the boys this month are splendid. Let us have experiences in hunting, farm anecdotes and some stories about your work with farm machinery; write about anything that interests boys. We have a splendid class of boys in Western Canada and they can make an interesting "camp." I will close with a game.

THE SIGNALMAN

This is a game calculated to break up any stiffness in a party and is much enjoyed. Place a row of chairs two less in number than the players. For example, if there are ten players put eight chairs. The players then take hold of each other's dress or coat so as to make a chain. One stands blindfolded, with a stick in her hand and sings:

Take your seat as soon as you can
When your called by the signalman.

The others walk solemnly round the chairs till the leader gives three quick taps with her stick on the floor, when each one endeavors to get a chair. Two are, of course, left out, the blind one and another who becomes signalman, the former signalman joining the chain. These resume their walk and watch for the next signal. Each time after the first chair is removed and those who are left without one are "out of the game" except the one made signalman. The one to capture the last chair wins the game. Sincerely, Cousin Doris.

BOY'S PRIZE LETTER.

Streamstown, Alta., April 4th, 1910.

Dear Cousin Doris:—I thought I would write and describe a game, and I hope to get a book. The game I am going to describe we call Blind Man's Buff; although it is not like the popular game we all play at parties. As many children as you can get form a ring, and one is chosen to stand blindfolded in the middle. The ring must spread as much as it can and then it moves round until the one in the middle calls "Halt." Then they all stop. The blind one begins to move slowly forward with arms stretched out and the child she touches, she must guess who it is. If she guesses wrong, they all go round till she again calls "Halt." If she guesses right, the one she catches goes to the middle with her, and then the blind one has to catch the other in the ring. When the blind one doesn't know where the other is she calls out "Adam," and the other answers "Eve," so the game goes on until the blindfolded one has caught the other who in her turn is blindfolded while the other goes back and joins the ring, and the game proceeds as before. There is a lot of fun in this game, because the blindfolded one has to keep calling "Adam" to hear where the other is. I like this game, and I hope the others will. Yours truly, Enid Lusty.

This is a very interesting game.—C.D.

Dear Cousin Doris:—I will write you a letter about the hills I herded there last summer. I herded on the old Shepard Ranch. Two of us herded 1,000 head of cattle, and 6 4head of horses. We had fine times. We got up at four o'clock in the morning and ate breakfast and then saddled up our horses then we would drive the cattle out of the corral. Some times we would drive them four miles from the ranch.

The ranch is built on the side of a lake. In the middle of summer we dipped the cattle. Maybe some of the children don't know what "dipping" is. If not I will tell them. They dip the cattle to kill a disease which is called Mange. To make a dip they dig a hole in the ground 10 feet long 5 feet wide, and 8 feet deep, then they curb it up with wood. Then they build a cage. Then we would drive the cattle into it and then we would would let them down into a mixture of lime, sulphur, and water. We would let them be in there for one minute, then we would pull them out with a team of horses. Wishing you paper success, I remain, Yours truly, Joel Allen, Weyburn, Sask.

This is a very interesting letter for the boys of our camp. May we have more letters telling of Western experiences?—C. D.

Graysville, Man.

Dear Cousin Doris:—Just a few lines describing a game to help our interesting club The game follows: Miss Butter fly, Miss House fly, and Miss Letter fly. There are three girls in a room and a boy stays in the room too, and the rest go out. Miss Letter fly has a wet rag and the boy calls in one of the boys and is going to give him an introduction to Miss Butter fly, Miss House fly and Miss Letter fly and when it comes to Miss Letter fly, they are going to shake hands with Miss Letter fly she hits them in the face with a wet rag. This is all. I hope I will see this in the paper. Yours very sincerely, Oscar Balter.

I would not care to meet Miss "Letter fly." Of course Oscar your letter would be in print. I will have all our boys letters printed.

The Revolt of Bismarck

Continued rom Page 69

less than that. then, his eyes dropped and his face turned as pale as it had red a few minutes before that. He grinned like a sick cat and turned away, and Guadalupe laughed and walked out of the dining-room. Right there I saw Lizzie bite her lip and look at Bismarck as if he wasn't there, and then, flip went her skirts, and the kitchen door swung to behind her. Pretty tough, eh?

"What devil got into Guadalupe I don't know. I don't think it was because he thought anything of Lizzie. I never seen any signs of it. It was just pure cussedness, I reckon, that made him pick on Bismarck from that time out. If it had been Lizzie, it seemed like he'd queered that game from the jump-off. No more special favors for the Dutch in Ferguson's. Bismarck might look as he pleased, but there was no danger of getting a flicker of an eyelash from the girl after that morning. She'd dump his dishes down alongside of him like he was ten miles away and she rather hoped he wasn't coming back. You can throw bricks at a man in such a way as to convey the impression that you ain't got a large amount of use for him, but it isn't a marker to white queen's-ware when it's dropped around by a dining-room girl who's soured on you. If it had been me, and there wasn't no other place in town for me to feed my glad young face, I'd have got me a cookstove and a couple of skillets and took risks on spoiling good raw material and an average fair digestion; but not so Bismarck; he never missed a meal, though there was never one that he didn't get a frost that would make your teeth chatter. Not only that, but there was always a chance that Guadalupe would be on hand, and, when that happened, there was other happenings. Sometimes it would be just plain insulting language; but, whether Bismarck understood it or not, that slid off him tolerable easy. Other times Guadalupe would make him pass his plate and empty a salt-shaker on his victuals, or take his pie away from him and eat it. If he came in and found Bismarck already setting at the table, he'd indulge in the same little pleasantry of pushing his head down on his plate, or jerking his chair from under him. The things he did were just like the mean tricks that one kid might play on another; but there was something in the way he looked while doing 'em that made you hold your breath expecting something more that wouldn't have no cheap foolishness about it. But Bismarck always acted as if he was going to roll over on his back and put his paws up. He'd give that sick grin and mumble something that sounded apologetic and that's all there was to it. He'd never look Guadalupe in the eyes in the way he did the first time he got manhandled. Maybe he saw all he wanted to then; I guess he did. I could see it glowing above that ugly, hooked beak every time the gentle joshing began.

"I took occasion to mention the hunch I had to Bismarck one time I overtook him on the road from the Morning Glory. There's times when the good advice I've got on hand is more than I can use myself. 'Bismarck, my friend,' I says, 'if you've got the sense of a summer sausage you'll keep out of Guadalupe Brown's way. You may think he's just having a little harmless fun with you, but I've seen a cat have sport with a mouse the same way, and there's always one end to it.'

"He stopped in his tracks and stared at me. Then he says, 'Mein Gott! how gan I? All der time he iss dere. Keep owit ohf his way? I gannot.'

"'I can tell you a darned good plan,' I says. 'Go get your time and climb aboard the Sidney stage. You might try Virginia City, or Coo-Stick, but it's my opinion, you'd be wandering back again in your weakminded condition, before a week was out. It don't matter where you go so long as you go far enough.'

"He shook his head.

"'If you're thinking about Lizzie let me tell you the stuff's off,' I says. 'If you hang around here a thousand years it won't do you no good with her.'

"Darned the Dutch! Blamed if he didn't sit down right there and weep. I couldn't stand that. I quit him. It made me feel uncomfortable. He was a little fellow, but he seemed to hold a heap of anguish and it come out hard.

"I wondered if he wouldn't take my tip, but he was right on deck the next morning at breakfact, looking like a small bar of soap after a hard day's washing. Guadalupe wasn't among those present then. It was early hours for him, but he showed up at supper and took a chair right opposite to Bismarck. For a few minutes he didn't seem to take no notice of him. He smiled at Lizzie when she brought him his steak, and, as she didn't respond, went on smiling at the steak as he cut it up. Bismarck took a quick look at him, and the poor little rat's hands began to tremble. Guadalupe seen it, too, and smiled harder than ever. He smiled as he reached for a biscuit, and he smiled as he plunked it at Bismarck and hit him in the eye; but the next instant he wasn't looking cheerful by no means: he was standing up and clawing at his shirt collar and cussing. Just as the biscuit left his hand, Lizzie jerked the full of a cup of hot coffee at him, and it took him in the neck and face.

"'You make any more breaks like that at this table and you'll hunt another place to eat,' says Lizzie.

"She made a picture as she stood there, her black eyes snapping and a patch of bright red on each cheek. Guadalupe stopped mopping his neck and laughed. Bismarck had jumped up, but when he heard the laugh he dropped back into his chair with a groan and wiped the sweat off his forehead with his paper napkin.

"'I didn't know he was a pet of yours,' says Gaudalupe.

"'No pet of mine,' says Lizzie.

'Don't you never think it. I have no more use for a man that can't take his own part than I have for a black-hearted, bloody-handed brute like you. If he wants to let you dog him around, that's his business, but you're not going to do it in here.'

"Guadalupe smiled again. 'I'll tell you,' he said, just to show you that my heart is good and that I aim to keep my hands clean I'll promise that I won't kill him—not unless I happen to run acrosst him again. You hear that, don't you, Dutchy? Lizzie wants to keep her floors clean, so don't you come around here any more—or anywhere else where I am. Hear me?'

"He stood a moment, sort of waiting.

"'Hear me?' he says again.

"Bismarck nodded and again wiped his forehead. Guadalupe laughed at him, and then at Lizzie. Then he looked around the table quickly, to see if any of the crowd seemed to disapprove, I guess. They didn't seem to. I know I just recollected my supper about that time. So he reached his hat down off the peg and swaggered out.

"Nobody said nothing for a while. Then Cicero Bentley spoke up. 'When are you going to start, Bismarck?' he asks.

"'I vas nod going avay,' says 'I kom her alvays. I am dog no more. You shall see.'

"He scraped back his chair and started off. Just as he got to the door Lizzie took a quick step or two forward, but checked herself and went back to the kitchen.

"Sam Hardwick whistled. 'If he ain't going away he sure will stay alvays,' he said. 'It's my belief that fool's going after a gun.'

"It was my belief, too, and I hadn't a heap of confidence in Bismark as a gun-fighter, so I started out to see if I could find him and give him some more advice. I went up to his cabin the first thing. The door wasn't locked, so I opened it and struck a match and went in. Blankets neatly tucked into the bunk, little green-painted chest that was his idea of a trunk in the corner, two or three books and his accordion on the shelf, but no Bismarck. I asked some of the boys if they seen him. Nobody had, except Joe Bradley, who said he thought he seen him walking up the trail to the mine. That didn't seem likely, seeing he was on the day shift, but I wasn't going to chase around after him all night, so I turned into Paul Kleman's, where Guadalupe put in most of his time.

"He was there all right—Guadalupe, I mean. There was a rancher from up Castle Creek had drove in a couple o' beef cows that afternoon, and Guadalupe and Pete Hathaway were taking the price of 'em away from him. There wasn't much doing in other respects, and the rancher was keeping sober and playing a cautious game, though the hands he got looked good enough for some lofty betting. So, after I'd watched 'em a while I started to leave, when Bismarck came in.

"I hardly knew him at first. He'd left the dining-room without his hat, and he was still bareheaded, with wisps of hair hanging over his face, looking as if he'd dipped his head in the creek. He was about the color of a greasy dollar, and his eyes were bloodshot and wild. He wasn't wearing any coat, and his shirt was bulged out from the throat to the waist with something lumpy that made him look like a gunnysack full of potatoes. He walked right straight to the backdoor that was standing ajar, closed it very easy and gentle, locked it and took out the key and put it in his pocket. Paul saw him and shouted out from the bar for him to open that door or he'd pound the daylights out of him.

"The only notice Bismarck took was to come back and shut the door opening from where the tables was set into the bar-room, and put his back to it. At that Guadalupe and the rest of us seemed to get a suspicion that something was happening. At the same time I saw what Bismarck had in his hand, and cold shivers ran up my spine. It was a stick of giant.

"'Chentlemen,' says Bismarck from the door. It wasn't like Bismarck's voice either. It was a sort of hoarse croak. All the same, there wasn't no trouble understanding it. 'Chentlemen,' he says, looking straight at Gaudalupe, ' vant you shouldt all lisden to me, und I vant nopody shouldt leaf until I haf got drough. If some one shall try to leaf I shall hit mit dis chiant on der gap und ve shall all plow to schmall pieces togedder. Dere is more in my shirt—und gaps. If I choomp or fall dere vill be no saloon here, dere vill be no Fritz Schuler, dere vill be no Gaudalupe Brown. Dere vill be noding but a hole in der groundt und der drouble all ofer.'

"I have heard speeches that was reckoned effective, but I never seen any effect like that little talk made. There were maybe twelve or fifteen of us herded in there by that animated dynamite-bin. We was breathing, spitting, laughing, restless, cussing human beings when he began. When he finished we was an assortment of chalk-faced, pop-eyed, slack-jawed petrifactions. Some of us did breathe, because you could hear it, drawed in and out, jerky and short, and you could see chests swell up, hold and collapse, but that was the only sound and the only movement. Gaudalupe made just the shadow of a motion with his right hand as he dropped his cards, but it never went farther.

"'Brown, *verdammter Hund!*' says Bismarck, suddenly taking a step toward the table.

"Gaudalupe's face began to twitch.

"'For why do you nod shoot? Shoot, you! I gif you leaf. Shoot, cowardt! Here is goot mark.' He put his hand on the bulges of his shirt.

"'Or here,' and he struck his forehead. 'Here is no chiant, skunk, gross vite lifer, dot you are! Lick your libs ad me, curdog und feist. Vell? No? You are afraid? Ohf vat—off deat'?

Dere is vorse as deat', if you haf a heart in your body. Yes, I know. Shoot, den!'

"Gaudalupe's face jerked again, but he didn't say nothing nor do nothing.

"'Oh, if I couldt dell you at you are,' says Bismarck, and trailed off into a stream of Dutch. Then: 'You shall kill me if I kom vere you are, liar! Sheep's soul! I shpit on you- No Nod yet?

"He reached over, gritting his teeth and slapped Gaudalupe's jaws, twice. Gaudalupe took it like a kid getting his face washed. The next moment Bismarck had him by the collar and was dragging him out of his chair. Then the terror howled for the first time. 'For God's sake- I'll go, I'll go!'

"What happened after that I can't say exactly, nor anybody else. The minute Bismarck took him by the collar the spell broke and there was a stampede. The ranchman went at the partition door, and it shattered before him, like a circus hoop, and the rest of it went flying as the others jammed it. I was clean to the blacksmith shop before I stopped to take the strap hinge out of the back of my neck. Paul Kleman says he was wiping glasses at the bar when the procession streaked by, accompanied by the wreckage of the partition, and he was surprised; but he wasn't half as much surprised by that as to see Bismarck trail along after, holding Gaudalupe Brown by the collar, and kicking him every third step.

"At the door Bismarck put all his heart and soul of one hob-nailed miner's boot into a parting kick that sent Gaudalupe off the sidewalk with a four-foot drop into the street, and then went back and slumped as limb as a rag into a chair and begun to cry.

"When we was eating our breakfast the next morning reference was made to the happening Juite a considerable. We went over it all a dozen times, I guess, and Lizzie seemed about as interested as any of us. Spurlock, the foreman of the Morning Glory, told about finding the lock busted off the power-house door, and allowed that it was his solemn duty to fire Bismarck, even if he had to hire him over for higher wages. Sam Hardwick was telling us what he had intended to do to Gaudalupe himself if he hadn't skipped, and what he would do to him if he ever came back. We was all so busy we hardlv seen when Bismarck came in.

"He shambled up to the table, looking as sheepish as a dog caught sucking eggs, and sat down without a word. We all quit talking too, and waited. We didn't have long to wait. Clippetty-clip. Here comes Lizzie with the tray, rosy as the dawn, and a sparkle in her eyes it would have done you good to see. Bismarck kept his head hanging while she unloaded the potatoes, graham gems, fried eggs, and the prize steak of the season at his place. But he raised it as she let her hand drop lightly on his shoulder, and the look in his face—and in hers—wasn't meant for a crowd to see.

"'Good-morning, Fritz,' she says.

"'Goot-morning, Lizzie,' says he.

"I got up and waved my hand, and the whole crowd got up like little men, and we tiptoed out and left 'em alone."

"The Cost of High Living"

Continued from page 14

The average man of to-day demands the best and demanding the best he has to pay for it. In former days it was a case of making a living while at the present time it is a case of living in luxury. The average man is an employer of labor and with an ever increasing burden of expense upon his shoulders, he grinds and harrasses those who are forced to travel in the under-groove in order to exact from them every ounce of labor, with the result that the poor are being forced lower and lower down the scale of poverty, while the rich are climbing steadily up the ladder of prosperity.

With the average man it is not the desire to grind those under him or to make a dishonest dollar, so much as it is the desire to place himself on a plane of independent luxury that is responsible for modern economic conditions. The manufacturer of a few years ago was content with a business whose capital stock could be quoted in terms of thousands; while the manufacturer of to-day is not content unless his capital stock can be quoted in terms of millions. The average man of a few years ago was content with a house, the cost price of which could be quoted in terms of hundreds, but the average man of to-day is only content with a house that can be quoted in terms of thousands. The average farmer of a few years ago was content to size his farm up in terms of acres, while the average farmer of to-day is content to size his farm up only in terms of sections.

It is not the "High Cost of Living" that is responsible for our present state of affairs so much as it is the "Cost of High Living" and in this case as in every other the old but true saying that "he who dances must pay the fiddler" holds good.

A doctor, returning from a professional call, found a load of hay overturned near his home, and a young Swede busy trying to reload the hay on the rack. He invited the boy to jump in the buggy, go to his home and have some refreshments before finishing his job, but the Swede said. "No! I don't tank my fadder he lak it." After some urging he was driven to lunch at the doctor's home. But every once in a while he would break out with: "I don't tank my fadder he lak it."

The doctor lost all patience with him and said: "Young man, I'd like to know what difference it makes to your father whether you are here taking lunch or down there pitching hay."

"Well," the boy replied, "you see, my fadder he be under de load of hay."

Li'le Ephra'm says — Even aftah beardin' so menny lions in dere dens, Kernel Rozyfelt showed great bravery by lettin' an Egypshun barber shave him.

Plant Diseases and Some Remedies

Continued from page 51

satisfactory for use in oats or barley. The formula is approximately 2½ parts of Mercuric bichloride ($HgC12$) to each 997½ parts of water, or approximately 1 lb. of powdered corrosive sublimate to 50 gallons of water. Pile the wheat upon a floor or upon a canvas, and thoroughly spray with a force spray while the grain is constantly shovelled so that it becomes evenly wet over the entire surface. Do not use any more of the solution than necessary to moisten the outside surfaces of the grain. This treatment is the most effective treatment for stinking smut of wheat known to us, aside from the formaldehyde. Corrosive sublimate is a strong poison and should be handled with care.

5. Formaldehyde: Use formaldehyde at the rate of 1 lb. (16 oz. Avoirdupois) to 40 or 50 gallons (U.S.) of water. The grain can be dipped in the solution or sprinkled or sprayed. This treatment is effective against all the smuts except that of corn, loose smut of wheat and loose smut of barley, and is beneficial against all other known seed borne diseases.

If the sprinkling and spraying method is used, in the case of wheat, it is only necessary that sufficient solution be used to dampen the entire outside of the grain. The object is to wet all of the spores that may chance to cling to the grain. In the case of oats or barley the dipping method is preferable in as much as a larger amount of solution comes in contact with the grain and thus may penetrate to all parts beneath the husks. If the work is properly done the wheat may be drilled at once. It is preferable to allow the oats and barley to stand under cover of blankets or canvas for two or three hours before attempting to sow. In the case of flax, the sprinkling or spraying method is preferable. The flax should be stirred very thoroughly while the spray is being thrown upon it. It should be piled and allowed to stand for an hour or so under canvas or blanket after which it should be stirred over and over and then can be seeded at once.

7. Vapor Treatments: There has always been a desire on the part of the farmers to procure some sort of treatment which would make it possible to treat a stream of dry seed by some kind of gas or vapor. There would be advantages in this as it might be possible for the seed to be more rapidly treated and also possible that a vapor treatment would be more effective, reaching all cracks and crevices in the grain coverings, possibly without swelling. This Department conducted a large series of tests with the view of using formaldehyde in the form of vapor treatment. The idea gave promise that it might be quite effective because of the all-pervading action of the gas. It was thought that it was possible that such a method might be very effective for treating grain on a large scale in elevators where the appar-

atus could be made upon a large plan. Extended experiments along this line, in which the strength of formaldehyde vapor was determined for each given exposure of the grain, developed the fact that, to be effective, an arrangement must be made which would give off sufficient water vapor to practically form a film over the exterior surface of all the grains. This film approximates the amount of water necessary to the liquid treatments. It was also determined that dry gases have little or no effect upon the spores of fungi. It is our belief at the present time that it will be practically impossible to get a formaldehyde treatment by means of dipping machines or by the sprinkling and spraying method.

8. The modified hot-water treatment for loose smut of wheat and barley: A treatment which promises much is known as the modified hot-water treatment for the prevention of loose smuts of wheat and barley. As previously noted, these types of smut are not prevented by ordinary treatments, or in fact by any treatment that simply applies to the exterior of the grain. The treatment was originated by Jensen, of Copenhagen, Denmark, during the season of 1889, for the prevention of loose smut and barley.

Soak the barley "from five to seven hours in cold water, followed by a fifteen minute soak in hot water at 52 degrees Cent. (125½ degrees F.)." For wheat, for the prevention of loose smut, Messrs. Freeman and Johnson recommended "Soaking for five to seven hours in cold water followed by immersion in hot water at 54 degrees Cent. (129½ degrees F.)" for ten minutes. The effective feature of this treatment is due to the long soaking in cold water. This undoubtedly makes a change in the character of the seed coat of the grain, and also the texture of the filaments of the fungi, which are inside of the seed coats of the wheat in such a manner that the following hot water treatment becomes destructive to the fungi. Persons undertaking this treatment should watch the temperature closely as the range between which the fungi are killed and the seed uninjured is comparatively narrow.

As the modified hot water treatment would be very expensive to carry out on a large plan, the way to make use of it with advantage would be to treat seed for a small seed plot sufficient to raise the seed for general field cropping the following year. Every farmer could do this without a great amount of trouble. Small wire baskets of one-half to one peck capacity are most satisfactory for this dipping work, though, no doubt, some of the regular dipping machines could be modified so as to properly handle the hot water end of the work when it would not be difficult to rapidly treat the large volumes of seed by this method.

To summarize as to treatments, the writer believes that the two treatments of value for the farmers of the Northwest are the regular formaldehyde treatment, as used for the prevention of stinking

smut of wheat and loose smut of oats, and the modified hot water treatment, as used in the prevention of loose smut of barley and loose smut of wheat. Either one of these treatments will prevent the diseases for which they are intended and largely eliminate all of the ordinary fungous diseases which are associated with cereal seeds. The only methods which are not in extensive use are the copper sulphate method and the formaldehyde method. The modified hot water method is now recommended only for the prevention of the loose smut of wheat and the loose smut of barley, and to be used in connection with the small seed plot to clean the grain for the following crop on the field areas. The general use of the formaldehyde treatment in the ordinary form will eliminate practically all of the seed borne diseases of wheat, oats and barley, with the exception of the two types of smut named. It will also destroy the spores of most of the indefinite fungous diseases of mould-like types, such as blight, root-rot, etc.

It is possible that the modified hot water treatment will be found to be of wider importance than simply the elimination of the loose smut of wheat and the loose smut of barley, for numerous experiments conducted at this station show that these are not the only types of cereal diseases which are born internally in the seed.

SWELLING OF SEED: In all of these methods of treatment the various types of grain are apt to be swelled considerably. The person doing the treatment should therefore learn how much the grain has swelled and set the drill to sow a quantity sufficiently in excess of that which he usually uses to offset the swelling.

MACHINERY FOR SEED TREATMENT OR SEED DISINFECTION.

Since the development of the various methods of seed disinfection, and especially since the development of the formaldehyde treatment, there have been invented many types of machines especially constructed for the purpose of dipping the seed grain. The formaldehyde treatment for general seed disinfection only demands that each of the seeds of the seed grain shall be evenly moistened over the entire exterior surface. It is not intended, however, that it will be sufficiently moist to wet up the bran covering and thoroughly moisten the hairs or brushes on the wheat, and that it shall be sufficiently applied to oats, barley, millet, etc., to moisten the chaff or scales enclosing the grains, both inside and out. We have introduced in this bulletin sketches or cuts illustrating a number of various types of machines that are now in use, not for the purpose of advertising any particular machine, but simply to call attention to the fact that there are machines on the market well constructed for the purpose of disinfecting seed grain. Each farmer should study the various types of machines carefully and upon visiting the machinery houses decide upon the one which is most apt to suit his needs. Some of the machines are so constructed

as to treat large columns of grain very rapidly, elevating the grain directly into the wagon tanks, and others are constructed simply to soak the grain, while some of them, though having comparatively small capacity, are very effective for the use of the person who farms in a small way. Furthermore, there is no excuse whatever for anyone raising either stinking smut of wheat, loose smut of oats, or flax wilt, on new lands for want of machinery. It is not necessary to have anything more than a good sprinkling pot and sense enough to sprinkle and shovel over the grain until it is evenly moist. A small three-gallon compressed air sprayer is the most satisfactory type of machine for doing this sprinkling and shovelling method, the pressure sprayer allowing the solution to be thrown in a fine, forceful, misty spray, so that all the grains are quickly made evenly wet. The writer belives that this is the most satisfactory way of treating flax seed, although some farmers have successfully used some of the different types of dipping machines with flax, stirring in dry flax after the dipping process to eliminate the excess of water. In any case the essential in treating flax is to grade the grain until only plump yellow seed is left, and no sticks or chaff or shrivelled grains. Our late studies upon wheat also show that this is a matter of great importance with wheat. Many of the shrivelled grains in the ordinary wheat crop are found to be infested with the filaments of indefinite fungi which attack the young seedling and later produce blighting, root-rot, and soil infection. Before treating seed wheat it should be thoroughly graded so that only plump heavy wheat remains. This will eliminate many disease bearing grains and the treatment used, whatever it is, will, in most cases, destroy spores of fungi which may be on the exterior of the grain, thus preventing new points of soil infection.

Shoeing the Farm Horse

The farm horse is generally an all-around purpose animal, and, for this reason should be shod. In addition to its being obliged to do the ordinary farm work, it is also used for hauling farm products to market, and for a pleasure animal for the family.

The farm horse should be shod with a moderately heavy shoe, one that will be durable and protect the feet. The shoes should have low calks in order that the frog may touch the ground. In winter the calks should be sufficiently long to get a good foothold on the slippery roads. If the feet are obliged to have shoes with the long calks for 3 or 4 months, then a bar shoe is to be recommended. The never-slip calks have became popular of late years for the reason that the calks are quickly removed and new ones replaced, thus saving time and money.

Just as great care should be taken with the shoeing of the farm horse as is taken with the valuable

race horse. The feet should be perfectly leveled and placed at an angle of from 45 to 50 degrees for the hind ones. The shoes should not be fitted hot as they are likely to start diseases of the feet which might cause trouble later. The shoe should be attached to the foot with as small nails as will be necessary to hold it in place. Then, as in shoeing all horses, the nails should not be drawn too tightly and pinch the sensitive structures.

It is best to have the shoes reset every four to six weeks. If the horse can be kept off the road during the summer months, have the shoes pulled off and allow the feet to come down to the ground and get the natural frog pressure. The feet should be kept growing; then there will be no trouble from the feet getting dry. Oil the coronary band twice a week. This band is located just underneath the hair line. It forms the horn of the wall, and if a new hoof is produced normally, the foot will not have time to become too dry.

Storage of Seed Potatoes.

Seed potatoes, like table stock, should be stored, as cold as possible, without frost. Light injures the flavor of table potatoes, which should be kept in the absolute dark. Light is a benefit to seed potatoes, as it toughens the skin and retards sprouting. Hence potato cellars should be partitioned so that the seed may be in the light and the eating potatoes in the dark.

Potatoes in large piles or in unventilated cellars often heat so that they will not grow well, and if for seed, are most vigorous if stored in boxes, crates or open barrels, or if thinly spread upon the floor.

Dirt should be carefully screened out of seed potatoes before they are stored, because much dirt among potatoes tends to heat them, and stop the circulation of air. If potatoes have been frosted in the ground and put in storage, they should be sorted over, the third week, to remove the rots, as the rotten potatoes tend to heat and kill the seed.

Every potato man should have two cheap thermometers tested in slush for correctness at 32 degrees F., one for the outside of the house and one for the cellar, and by opening and closing doors and ventilators and in letting in cold or keeping out warmth or cold, he should hold the potatoes from 32 to 35 degrees all winter, and fight back the spring rise in temperature as much and as long as possible.

After the temperature gets up to 45 degrees, the potatoes should be thinly spread out and shoveled over once a week, or oftener, to discourage sprouting.

The first sprouts that come are the most vigorous and afford a sort of natural selection. If potatoes were set by hand, like cabbage plants, it would be well to have these sprouts started before setting. Where planters are used, seed potatoes should not sprout at all, until their most active sprouts start after the tubers are in the ground.

The Horse Breeding Industry of Saskatchewan.

Considerable activity has been shown in the horse industry of Saskatchewan by the purchase of a large proportion of the 18,000 work horses which have been brought in from the Province of Ontario and the States and distributed to western points from Winnipeg and Brandon since the 1st of January. This, in itself, is a significant phase of the horse breeding industry of the province, and goes to show that it will be many years before the supply of work horses is likely to overtake the local demand. At the same time there is a sufficiently high duty placed on the importation of horses that are not of pure breeding to make the business of the owners of stallions in Saskatchewan a lucrative one.

It may be mentioned in passing that it is strictly essential that the owners of stallions should take out enrolment papers or have their animals' certificates of enrolment transferred in the manner prescribed by The Horse Breeders' Ordinance of Saskatchewan. Furthermore, every bill, poster, or advertisement issued or used by the owner of a stallion enrolled under the above mentioned ordinance must contain a copy of the stallion's certificate. These regulations apply with equal force to pure bred and grade animals. A copy of The Horse Breeders' Ordinance may be obtained, free of charge, on making application to the Deputy Minister of Agriculture, Regina, Sask.

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WANTED—One good Hart-Parr plowing engine. State price and terms.—Jos. Pantel, Somerset, Man.

SOUTH AFRICAN SCRIP FOR SALE—Cash and terms with good acceptable security to farmers in Alberta and Saskatchewan.—Address A. D. Mabry, Saskatoon, Sask.

VALUABLE—Farm for sale at a bargain if bought at once. All necessary buildings, new. Excellent location. Creek at stable, eighty acres under cultivation, rest pasture, good fences, near Regina, Saskatchewan. For further particulars, write A. K., c.o. M. W. Kapell, Pilot Butte, Sask.

FOR SALE—South-African Scrip. Two years' terms to farmers with acceptable security.—Romeril-Fowlie & Co., Prince Albert, Sask.

FOR SALE—One Avery Steam Plow, 1906 make, with ten breaker and stubble bottoms and steam lift complete, at Elm Creek, Manitoba. For further information address—Walter M. Grimes, Nokomis, Ill., U. S. A.

WANTED—Second-hand Cockshutt engine gang plow, 8 or 10 furrows. Quote lowest price F. O. B., railway, Jas. W. Mitchell, Arrow River, Man.

WANTED—One reliable man in each locality with rig, or capable of handling horses, on salary or commission, to introduce and advertise our Royal Purple Stock and Poultry Specifics to the trade and direct, post up large bills, 7 feet wide and 9 feet high, tack up tin signs, and generally look after the introduction and advertising of our goods. Apply at once. W. J. Jenkins Mfg. Co., London, Ont., Canada. 35-5

FOR SALE OR EXCHANGE—80 acres of land in Minnesota. Would be willing to sell for cash or exchange for a 45 H. P. Hart-Parr Gas Traction Engine.—J. F. Crosby, Hanlan, Sask.

FOR SALE—One dozen of our hardy, improved Bush cherries, prepaid to any address in Manitoba, Alberta or Saskatchewan for two dollars. Perfectly hardy. Good canning fruit, Catalog free. Buchanan Nursery Co., St. Charles, Man.

Our ten dollar hardy fruit collection is just the thing for those who wish to plant fruits and do not know what varieties to select. Only the very best varieties for this country supplied. Buchanan Nursery Co., St. Charles, Man.—Catalogue free.

ENGINEER wants position on a plowing engine or a stationary for the season of 1910. Have had two years' experience; am also a graduate of the Heath School of Engineering. Can furnish references. Chas. McMain, Summerberry, Sask.

WANTED—Position as assistant engineer on ploughing outfit for the coming season. Am experienced in steam ploughing, can do repair work and also handle blacksmith's tools. Can furnish best of references as a fireman and assistant engineer. When writing please give name of engine. G. A. Webster, Cailmount, Sask.

YOUNG MAN used to gasoline engines wants position on gasoline tractor this summer. State make of engine and wages to Box 3079, Canadian Thresherman and Farmer, Winnipeg.

KNOW THE LAW.

It will only cost you One Dollar. A lawyer will charge you five for advice on one question. My "Legal Compendium" is full of legal information, and is pronounced by 20,000 people and by press and legal experts to be the best law book of its kind ever published. One dollar to any address. J. R. Long, J. P., Mortlach, Sask.

FOR SALE—One Gould Balance valve for 22 or 25 H. P. Gaar-Scott engine. J. Reynolds, Yellow Grass, Sask.

ENGINEER—Wants position on plowing outfit coming season in Manitoba, Saskatchewan, or Alberta. Saskatchewan certificate. Strictly temperate. Do own repairing. References furnished. —Edward Winchester, Melita, Man.

TRAVELLER WANTED—Energetic, experienced Traveller wanted to sell Threshing Machinery in Manitoba and Saskatchewan. Address, Box 3079, Winnipeg.

WANTED—Position as engineer on steam plowing outfit the coming season in Manitoba or Saskatchewan, or Traction Engine work of any kind. R. H. Pargest, McLean, Sask.

FIREMEMAN—First Class Fireman wants position on a plowing outfit when plowing begins. I am a graduate of the Heath School of Traction Engineering and I know how to fire properly and save coal. Wages, $2.50 for firing or $3.50 for firing and handling plows both. Write at once stating make of engine and when plowing begins to E. K. Siemens, Rosenfeld, Man.—Box 63.

EXPERIENCED Practical Engineer, Fireman and Traction Plowman desires position. Licensed for Saskatchewan and Alberta, also Graduated Student of The Heath School of Traction Engineering. Apply H. L. Bushell, 448 Elgin Ave., Winnipeg.

CERTIFIED ENGINEER and Machinist with fifteen years' experience wishes position on steam or gasoline plowing engine. Can do own repairing. Apply D. Mark, Manville, Alta.

A COOK and Caker seeks place on big farm, ranch or other place where good board is appreciated. Wages moderate. State wages. Address F. M. Burns, 295 Thompson St., Winnipeg.

THRESHER wants position on a steam plowing outfit for coming season in Alberta or Saskatchewan. References furnished. For information reply to Box 93, Broadview, Sask.

HARDY Ontario Nursery Stock, apples plums, small fruits, hardy roses and ornamentals. Agents wanted immediately on vacant territory. Thos. W. Bowman & Sons Limited, Ridgeville, Ont.

WANTED—Position on steam plowing outfit, firing preferred, experienced. Frank Campbell, Marquette, Man.

WANTED—A job running engine through plowing season. Will take engine on through threshing season if desired. Can do own blacksmithing, flue work on engine a specialty, graduate of Heath School of Traction Engineering; also have papers to operate in Saskatchewan. Address G. Y., Box 3079, Winnipeg.

ENGINE OWNERS write me for terms on refluefing and stay bolt repairing. I can save you money. I am also open for engagement during the plowing season. Chas. Fenwick, Licensed Engineer, Wapella, Sask.

POSITION WANTED by practical and experienced man as engineer on plowing outfit for the months of May and June. Have had a number of years' practical experience with different makes of traction engines in the States, also in Canada. Anyone in need of a trustworthy and reliable man is invited to call or write, addres Jos. H. Polley, Elbow, Sask.

ENGINEER wants position on breaking outfit this season. Holds certificate for 50 horse power in Saskatchewan. References given, strictly temperate. Apply Mark Ketteringham, Box 43, Foxwarren, Man.

WANTED—Position as engineer on plowing engine. Can begin work at once. Fully experienced in Western Canada. References furnished. Joseph Richers, 73 Farr St., Winnipeg.

EXPERIENCED Practical Machinist desires position as Threshing Engineer in Manitoba. Apply W. B. c. o. Canadian Thresherman and Farmer.

WANTED—Position for all next summer to run engine, by good experienced Steam Saver engineer. When apply please state wages and make of engine you have. Address J. E. Peatch, P. O. Clove, Sask.

WANTED—Position as fireman during plowing and threshing season of 1910. Two years experience. Can operate engine if necessary. References. Reply stating wages to Russel Alguire, 255 Dorothy St., Winnipeg.

WANTED—Position as Engineer, experienced. First class references. Ready to start at once. Saskatchewan or Alberta preferred. Apply Box A, Winnipeg, Man.

FOR SALE

One No. 2 Austin Well Drill Outfit with ¾ inch cable 350 feet long, weight 5,000. One 6 horse power upright Fairbank and Morse engine, with Wizard Magnet attached loaded on low truck. All in first class order. Address Didsbury, Box 188.

FOR SALE

20 H. P. J. I. Case Simple Traction Engine run 75 days, J. I. Case 32x54 separator with feeder and blower, weigher bagger, 150 ft. 8 in. drive belt, steel tank, and 1 wood tank and caboose. Easy terms of payment. Reference, Harrison Bros., Holmfield, Man. Apply to Hendry Blackwell, Jr., Holmfield, Man.

FOR SALE

At bargains. Second-hand engines and separators or complete outfits. Thoroughly rebuilt and repainted. Good as new. A long list to select from. Write us your wants or come and see us.—**AMERICAN-ABELL ENGINE AND THRESHER CO., LTD., WINNIPEG, CANADA.**

FOR SALE OR EXCHANGE FOR LAND

Good second-hand Portable Steam Engine, 26 h. p. double cylinder separator and plows Terms and price would be made most interesting to threshermen. Calvin Young, Mapleton, Man. Apply to Manitoba Bridge and Iron Works, Winnipeg, Man.

FOR SALE

One 25 h. p. direct flue, Simple, heavy gear tracrion engine.

One 21 h. p. Compound, return flue, traction engine.

One 18 h. p. Simple, return flue traction engine, and one 25 h. p. Compound, return flue traction engine.

Also several others of our own and other makes. We also have several rebuilt separartors of our own and other makes.

GAAR-SCOTT & CO., WINNIPEG

FOR SALE

One American Advance Separator, 36 x 56, with all latest attachments. One 15 inch Vessott Grinder; One 2 wheeled Engine Tender; 2-3furrow John Deere Engine Gangs. The above property for sale cheap. F. W. Hunter, Stonewall, Man.

FOR SALE

Two four bottom Moline engine gangs with beaker bottoms and extra shares, price, $160.—J. Hansford, Fairlight, Sask.

FOR SALE

1—12 H. P. Compounded (Case) portable engine No. 11374.
1—15 H. P. Compounded (Case) portable engine No. 13426.
1—15 H. P. Simple (Case) portable engine No 15833
1—15 H. P. " traction " " 13281
1—15 H. P. compounded " " " 9872
1—20 H. P. Simple " " " 13261
1—25 H. P. " " " " with 36-inch drive wheels No. 17579.
1—32 H. P. " " " " 19000
1—22 H. P. Compounded (Advance) traction engine.
1—18H. P. John Abell portable engine.
1—16 H. P. Stevens & Burns portable engine.

For the price, terms, and conditions of any of the above engines, write us. Our rebuilt engines are bargains.

J. I. CASE, THRESHING MACHINE CO., Winnipeg, Man.

BARGAINS

Give these bargains your attention.

Four Case Portable Engines at $1,500; two Minneapolis Tractions, 9000, 18 and 20 H. P.; one Advance Traction $800

1 Case 20 H. P. Traction Engine $800.00

Several good Separators to suit the above engines. See our farmers Pet separator

All our engines fitted with Gould Balance valves.

Write us about them.

THE GEO. WHITE & SONS CO., LTD. BRANDON, MAN.

FOR SALE

One 15 H.P. Case Traction Engine, with or without 28 x 50 separator. For sale or exchange with a Gasoline Traction Engine.—WILLIAM BRAYSHAY, Kelloe P. O., Man.

FOR SALE

One 36 x 56 Great West Separator, with feeder and wind stacker. This separator has been run for 20 days last fall and is practically as good as new. Address: A. FORATH, Raymore, Sask., G.T.P.R.

FOR SALE

SECOND-HAND AND REBUILT MACHINERY.

Two 25 H. P. Simple J. I. Case engines.
One 15 H. P. Simple J. I. Case engine.
One 15 H. P. Compound J. I. Case engine.
One 32 x 54 Wood Case separator.
One 28 x 50 steel Case separator, with wind stacker, self feeder and weigher.

J. I. CASE THRESHING MACHINE CO. Calgary, Alberta

BARGAINS

1—32 H. P. Reeves Rebuilt Cross Compound.
1 Rebuilt American-Abell Advance 20 H. P.
1 Minneapolis Separator 42 x 72. Rebuilt. With all attachments.
1 J. I. Case Steel Separator, complete with all attachments, 42 x 62. Run forty days.
1 Advance 36 x 60 Separator, Battle Creek with Hawkeye Fosston Wind Stacker.

HAUG BROS. & NELLERMOE Co. Ltd. WINNIPEG.

FOR SALE

Two Rebuilt Threshing Outfits:

22 H. P. Port Huron Compound Traction Engine No. 5057, equipped with steel gearing and all plowing attachment.

36 x 60 Port Huron Rusher Separator No. 6569, with all attachments.

Price F.O.B. Winnipeg, Man., for full outfit ..... $2,500.00.

21 H.P. Port Huron Compound Traction Engine No. 5203, steel gearing, all plowing attachments.

36 x 60 Port Huron Rusher Separator No. 6685, with all attachments.

Price F.O.B. Winnipeg, Man., for full outfit ..... $2,300.00.

These outfits have been thoroughly rebuilt, painted and varnished, and ready for immediate shipment.

We guarantee them the same as we do new machinery. Write

CANADIAN PORT HURON CO., LTD. WINNIPEG, MAN.

FOR SALE

One 30 H. P. Geiser Plow Engine. One ten bottom Cockshutt Plow. This outfit has only been in operation for one season. A snap. Good reasons for selling.—JESSE CROSBY, Warren, Man.

REBUILT MACHINERY ON HAND AT BRANDON.

1-34 H. P. C. C. Hy Northwest Traction engine.
2-28 H. P. C. C. Hy Northwest Traction engine.
2-25 H. P. Northwest Traction engines.
1-25 H. P. New Giant Traction engine.
2-20 H. P. New Giant Traction Engines.
2-18 H. P. New Giant Traction engines.
2-21 H. P. Port Huron Traction Engines.
1-20 H. P. Sawyer & Massey Traction engine.
1-20 H. P. J. I. Case Traction engine
1-25 H. P. J. I. Case Traction engine.
1-17 H. P. Sawyer & Massey Portable engine.
3-size 7½ 40x64 Northwest Separators with N. W. Feeder, Windstacker and Dakota Perfection Weigher.
1-size 6 36x56 Northwest Separator with Parsons Feeder, N. W. Windstacker, and Dakota Perfection Weigher.
1-size 3½ 32x52 Northwest Separator with N. W. Windstacker, Parsons feeder and Dakota Perfection Weigher.
1-36x60 Sawyer & Massey Separator with attachments just as it stands. (not rebuilt).
1-36x60 Port Huron Separator with all attachments just as it stands. (Not rebuilt).
1-36x58 Case Separator with all attachments, just as it stands. (Notrebuilt).

All the above engines and separators, except last three mentioned Separators, are or will be thoroughly rebuilt and repainted and warranted to be in first class shape and working order, and will be sold cheap.

Write for particulars.

NORTHWEST THRESHER COMPANY Brandon, Manitoba.

FOR SALE

30 H. P. American-Abell Sim. Trac.	$2500.00
26 H. P. American-Abell	1700.00
26 H. P. John Abell Sim. Trac	1200.00
22 H. P. American-Abell Sim. Trac	1500.00
22 H. P. American-Abell	1200.00
22 H. P. American-Abell Cross Comp	1200.00
22 H. P. American-Abell Simple	1500.00
22 H. P. American-Abell Simple	1500.00
28 H. P. American-Abell Cross Comp	2500.00
18 H. P. American-Abell Simple	1000.00
18 H. P. American-Abell Simple	1000.00
18 H. P. John Abell	900.00
18 H. P. Advance Comp. Tracrion	1000.00
18 H. P. Advance Comp.	1100.00
19 H. P. Minneapolis Comp. return flue	1000.00
20 H. P. American-Abell Portable	800.00
18 H. P. American-Abell	800.00
14 H. P. American-Abell	800.00
36x90 Tor. Adv. Sepr., 36 inch Parsons feeder	575.00
36x56 Tor. Adv. Sepr., 36 inch Parsons feeder, 56 inch Maple Bay Windstacker Perfrection E. W. & W. L.	700.00
40x56 Advance Sepr., 40 inch Advance feeder, Advance Wr. & W. L.	550.00
36x60 Toronto Advance Sepr., 36 inch Parsons feeder, Straw carriers	575.00
36x90 Toronto Advance Sepr., 36 inch Parsons feeder, 60 inch A-A Windstacker, Perfection E. W. & W. L.	750.00

These goods have been thoroughly rebuilt, painted and put in first class condition throughout and will stand up to the high reputation that our rebuilt machinery has acquired in the past. The prices quoted are f. o. b. Winnipeg.

AMERICAN-ABELL ENGINE & THRESHER CO., LTD., WINNIPEG.

FOR SALE

Rebuilt Gasoline Engines for sale by 2nd hand Department Canadian Fairbanks Co., Limited. An opportunity to get a good engine at a low price.

2 Horse Power Fairbanks-Morse Vertical
3 Horse Power Fairbanks-Morse Vertical
4 Horse Power Fairbanks-Morse Jack of all Trades
6 Horse Power Fairbanks-Morse Vertical
12 Horse Power Fairbanks-Morse Horizontal
15 Horse Power Fairbanks-Morse Horizontal
5 Horse Power Howe Horizontal engines
18 Horse Power Howe Horizontal engines
15 Horse Power Stationary slide valve steam engine
8 in. Stover Grain Grinder with Bagger

Send for special price on above machines, and full particulars. Quotations made subject to prior sale.

SECOND HAND DEPARTMENT THE CANADIAN FAIRBANKS COMPANY, LIMITED, 92-94 Arthur St., Winnipeg, Man.

Are You Going to Build?

We wish to draw your attention to the Weir Ready Made Cottages advertised in another page. These cottages are a great boon to the settler or homesteader as well as to townspeople as they can be put up in such short time after delivery at station. These cottages are built in all sizes, made absolutely warm and are manufactured at the factory's plant in Winnipeg. In conversation with Mr. Drynan, of the William S. King Co., Mr. Drynan informed our reporter that their factory is kept busy taking care of spring orders and that they were receiving orders from all over Western Canada for these ready made cottages. The above firm will be glad to furnish catalogues to all interested parties.

The Barth Jack Booklet

It is seldom a booklet with as much really interesting information as the above is issued. This booklet is really more an instruction book on jacks in general than a eulogy on one jack in particular.

It not only tells of new uses for a jack, but it shows these with illustrations in colors.

Those who do not have jacks or who believe jacks were made for lifting only should write for a copy

The Barth Manufacturing Co. of Milwaukee, who issues this booklet, tells us that while the booklet is too expensive for general distribution they will gladly mail a copy to any of our threshermen readers on request.

WESTERN CANADIAN IMPLEMENT DIRECTORY

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6—BRANDON MACHINE WORKS Brandon.
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8—BRANDON & ROBERTSON, Brandon.
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McCormick Disc....33
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Paris Disc and Drag....49
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Paris Feed Cutter....49
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Wilkinson's Feed Cutter....61

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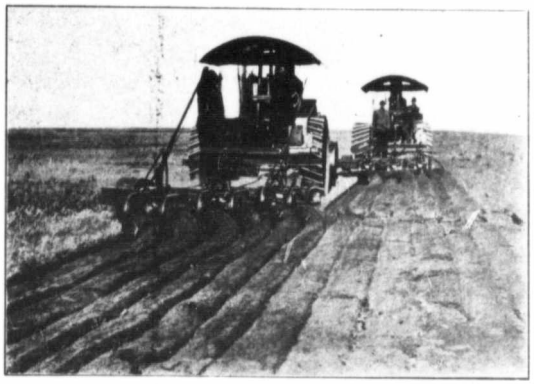

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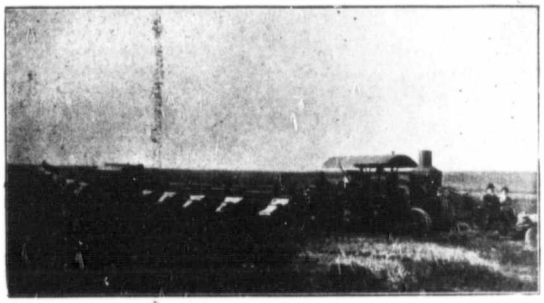

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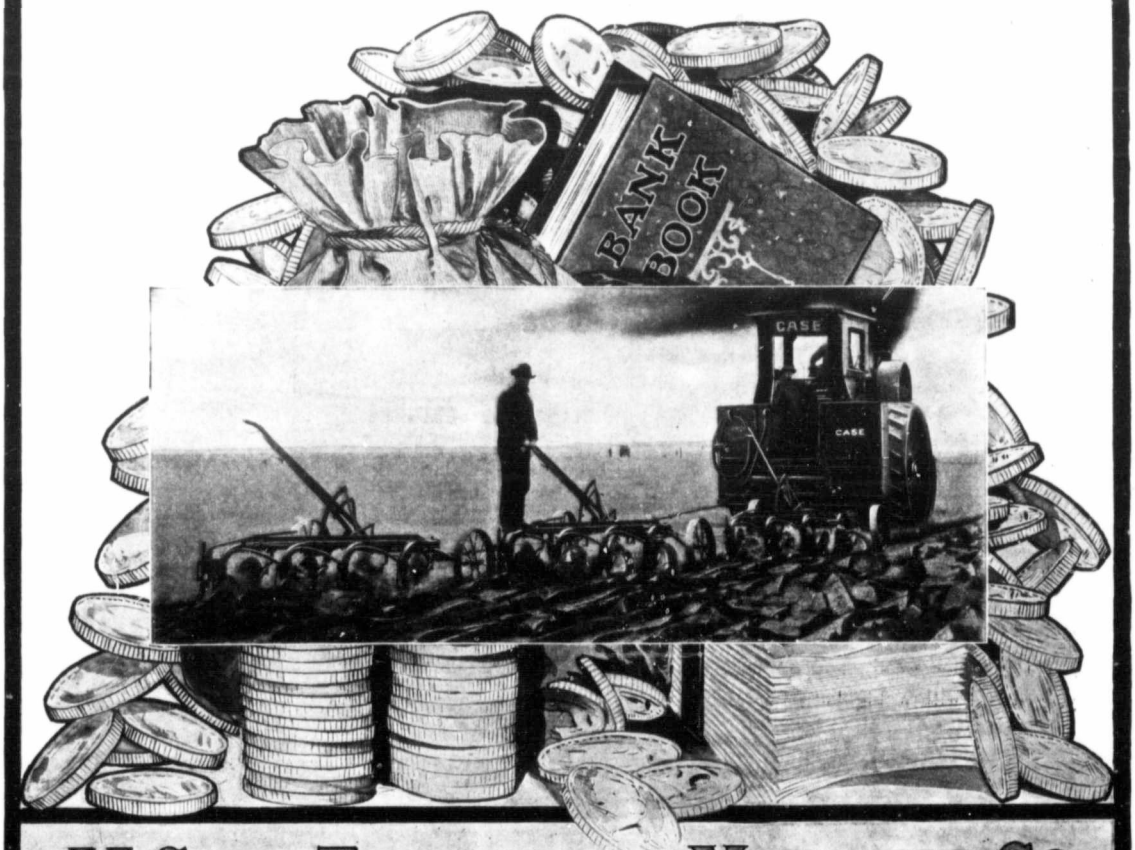

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