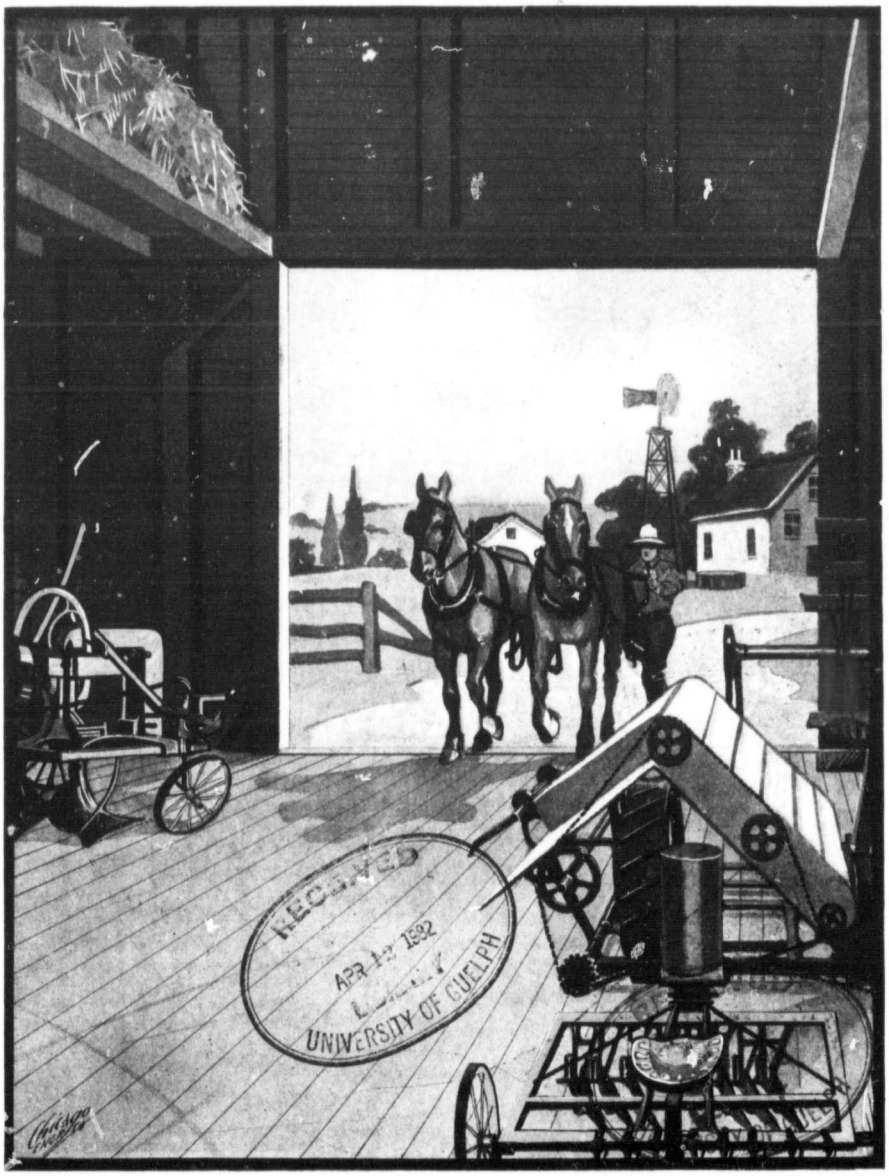
THE CANADIAN THRESHERMAN and FARMER

CANADA'S FARM MACHINERY MAGAZINE

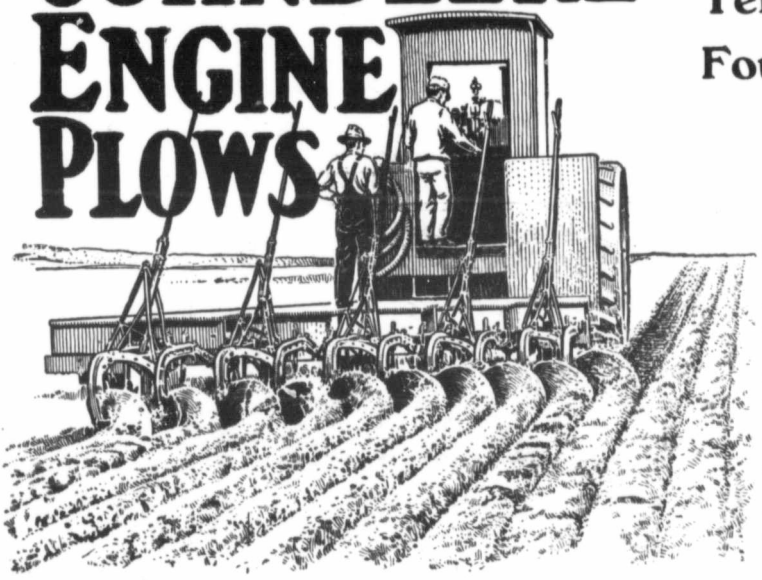
WINNIPEG · CANADA

MARCH, 1911



E.H. Heath Company Limited Publishers

JOHN DEERE ENGINE PLOWS



Four, Six, Eight, Ten, Twelve or Fourteen Bottoms

Equipped with

Deep Suck, Quick Detachable Shares

Handiest Feature Ever Put on an Engine Plow

Buy a John Deere Engine Plow

Because these plows have the longest successful field record back of them.

And more of them are in use than of any other make.

Which is the best evidence of their efficiency.

Because it is a safe bet that farmers generally will not buy an implement unless it gives satisfaction.

John Deere Engine Plows are very strong, pull easy, handle easy and do the finest kind of work.

They are strong because of the high grade material used.

They pull easy because **John Deere** bottoms are light in draft.

They handle easy because there is only one lever for each pair of plows and every other desirable convenience is provided.

They do the finest work because the pulverizing and turning qualities of **John Deere** bottoms have never been equalled.

Quick Detachable Shares A Big Advantage

It takes a lot of valuable time to change shares on an ordinary engine plow.

John Deere Engine Plows are equipped with **quick detachable shares** which can be changed in one-fifth the time usually required for other makes.

Each share is removed by taking of one nut which is easy to get at instead of four nuts inconveniently located.

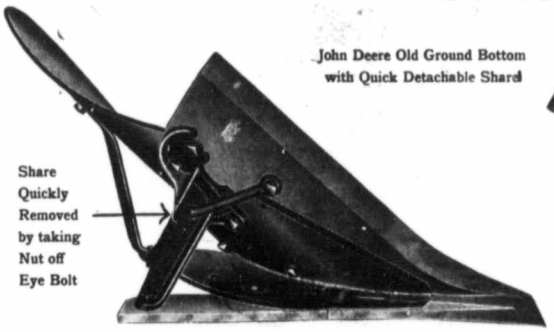
Illustrations below give you a good idea of this feature.

Another thing, the one eye bolt holds the share more securely than when bolted to frog in the old way.

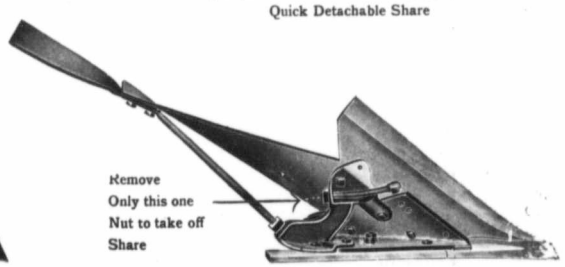
Think of saving 80% of time ordinarily required to change shares. This means a lot—especially when in a hurry.

Ask your John Deere Dealer about these plows, or write us for Engine Plow Book. This book contains all available vauable information on Engine Plowing.

John Deere Old Ground Bottom with Quick Detachable Share



John Deere Breaker Bottom equipped with Quick Detachable Share



JOHN DEERE PLOW CO. LTD.

Winnipeg Regina Calgary Saskatoon Edmonton Lethbridge

John Deere One Man Engine Plow

Operated from Engine Cab or Platform by Engineer

One Man Operates Both Plow and Engine

The John Deere Engine Plow shown in this add is an ideal proposition for those who want a small one man outfit.

It works perfectly behind any small tractor that requires only one man to operate.

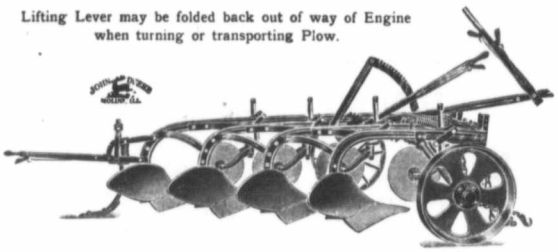
And the operator of engine handles plow without any assistance, because the lifting lever is just as handy for him as controlling levers of engine.

Combined with a small tractor this plow makes a very handy outfit which is economical to operate and conveniently used in comparatively small fields.

It will save money and time if substituted for horse drawn plows.

Engine of course, can be used for other purposes besides plowing. It is a general purpose farm power.

Lifting Lever may be folded back out of way of Engine when turning or transporting Plow.



Bottoms Equipped with Deep Suck, Quick Detachable Shares.

Handles Very Easy

When plow is leveled and rear shoe set for plowing, the lifting lever is the only one that needs to be touched till land is finished. This lever extends far enough forward so engineer can operate it conveniently from engine platform.

Remember this plow has no platform and that it is not necessary to step down from engine when raising bottoms.

In raising plow wheels crank backward, giving practically a power lift when engine is running.

Besides this, powerful lifting springs assist lifting lever.

Three, Four or Five Bottom

The John Deere Engine Plow for Small Tractors is sold regularly with four bottoms, but it can be converted into a three or five bottom plow as conditions require.

To make a three bottom plow remove rear beam and bottom and substitute blind beam which supports land axle and clevis frame.

To make a five, attach fifth beam and bottom, also attach shoe to fifth beam.

This ability to increase or decrease number of bottoms is important.

For example, in heavy breaking the engine may not be able to handle more than three bottoms, while in loose stubble ground it may pull five easily.

Deep Suck Quick Detachable Shares

These are not ordinary shares with the nose turned down. They are specially built for our engine plows and are very durable.

Quick detachable feature is a big advantage because it saves at least 80% of time ordinarly required to change shares on an engine plow. This means a lot—especially when in a hurry.

Simply remove one nut to take off share. This nut is easy to get at and holds share more securely than when held to frog by four bolts in customary way.

John Deere Jumbo Grub Breaker

For Use with Traction Engines

Built for Heavy, Stony, Grubby, Poplar or Other Brush Lands.

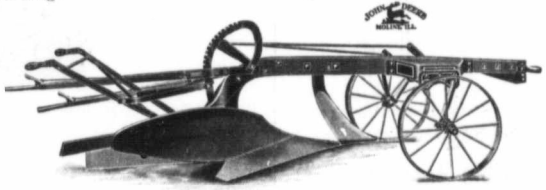
There are many localities, especially in the Northwest, where there are large areas covered with grubs and it is desired to use an engine instead of horses for breaking.

This requires a specially built plow of great strength.

And that is what the JOHN DEERE JUMBO Grub Breaker is.

It has the strength, turns a 24-inch furrow, cuts off all roots to depth of furrow and throws them out so that it is easy to clear the land.

It stands to reason that it is much more economical to clear a piece of brush land in this way, because the work is more rapidly done; all the roots are cut off deep enough to prevent sprouting and the ground is well plowed at the same time.



Cuts 24 inches wide and any depth up to 10 or 12 inches. Weight 950 pounds.

All Steel—Has Great Strength.

The beam, levers, lever ratchets, clevis wheels, axles, handles and all other parts are made of high grade steel.

The fact is, the Jumbo Breaker is so strong that it will stand the pull of a high-powered engine without straining or breaking—you know what this means.

Specially Constructed Beam

Instead of being one solid piece, the beam is made of three heavy flat steel bars securely bolted together.

This makes a very strong beam and permits the two outside bars to be shaped so that one supports the moldboard and the other the landside.

Fore-Carriage Insures Steady Running

Two large, wide-tired steel wheels mounted on strong steel axles support front end of beam and steady the Plow when at work.

Also axles operate with levers to regulate depth, level the plow and raise it out of the ground.

Extra Heavy Standing Cutter

This cutter is held to beam by a strong clamp and is drilled at heel to receive share point—a great protection to share.

Clevis Gives High or Low Hitch

By referring to illustration, you will see that by inverting clevis a high hitch is obtained.

Clevis as shown gives a medium or low hitch.

Inverted, it gives a medium to high hitch.

Write us for further information about either or both of these plows

JOHN DEERE PLOW CO. LTD.

Winnipeg Regina Calgary Saskatoon Edmonton Lethbridge

The Acme Grain Pickler

Acme Grain Pickler

Capacity: 100 Bushels per hour

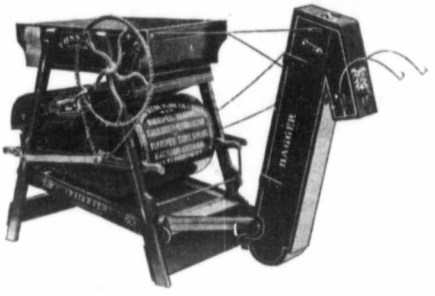
The Crop Insurer!

THE ACME is an Endless Screw Machine. Thoroughly pickles all the grain and is proof against destruction from bluestone solution.

Equally effective with formalin. The easiest operated most efficient and perfect pickler offered.

ORDER NOW.

The Fosston Grain Cleaner



THE FOSSTON

Will enable you to rid your field of wild oats.

Will take oats out of wheat or flax better than any other mill made.

Absolutely the best cleaner of all kinds of grain ever invented.

Here are Fosston Facts

The only **Patented Feed Device**—which allows grain in Machine only when running—Feeds full width of sieves.

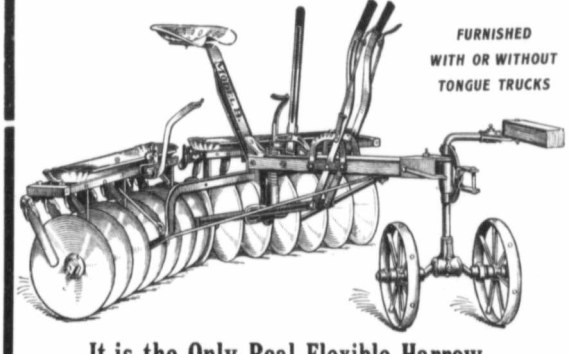
A **Patented Gang** for separating wild or tame oats from wheat. Composed of a series of nine perforated zinc screens.

A **Bottom Screen** thirty six inches long. Under this screen in arranged a patented cleaning rack to keep bottom rack clean. Special attachment for seperating wild or tame oats from barley. Screens for cleaning all kinds of grain. Bagger can be attached in five minutes.

DISC HARROWS

Deere Model B Disc Harrow

FURNISHED WITH OR WITHOUT TONGUE TRUCKS



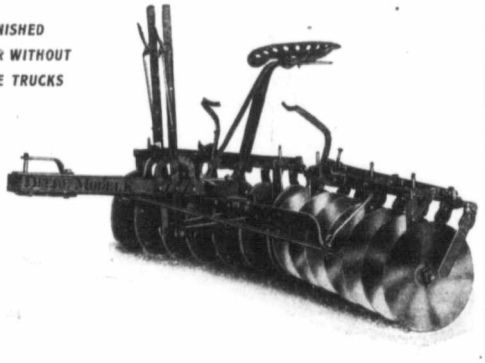
It is the Only Real Flexible Harrow

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 **controlled** draw bars enables you to govern your discs. They can't push up in the 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

FURNISHED WITH OR WITHOUT TONGUE TRUCKS



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 riveted 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 very best quality steel, thoroughly polished and sharpened. Double **Angling Levers** on this harrow 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, LTD.

Winnipeg Regina Calgary Saskatoon Edmonton Lethbridge

To the Threshermen of Canada.

TALK No. 2

This is your magazine. We know that you appreciate it or you would not have stood by us as you have during the past eight years. We have tried to give you full value for your money and have at all times tried to keep pace with the growth of your business.

When this magazine was started steam was predominant. As a means of farm power it was then the only thing in existence. Our discussions at that time were wholly and solely steam.

In 1905 we introduced to you our first Traction Plowing number. At that time we scoured the Canadian West for traction plowing experiences and succeeded in getting hold of thirty-eight. Since that time however, the traction plowing proposition has made wonderful strides, no better evidence of this than the fact that we have in our office at the present time nearly five hundred traction plowing experiences that have been sent in since the first of January, 1911.

The Department of Agriculture at Washington, D.C. told us over a year ago that we had done more for the traction plowing proposition than any other single factor in the world and that the people of Western Canada were to be congratulated upon having such a publication.

The next thing that came into the field was the gas tractor. We saw that it was going to develop into something good and accordingly entered upon a discussion of this farm implement with the result that we have given to our readers more material on the gasoline engine than any other paper published in Canada today. As a matter of fact we except no one in this case anywhere outside of the regular gas publications.

With this issue we begin a new department for the thresherman. We will publish every month one or more pages of threshermens' experiences.

We want your experiences. We want you to tell us what success or failure you had during the past year with your threshing outfit. Your fall's run will make an excellent story if you will but give us the facts. You have them and we want them. We are going to make it worth your while to give us these experiences and in doing so make you the following proposition.

Just sit down and write us the plain facts as you would tell a neighbor. It may take you one evening to do it, or it may take you two evenings, but we believe that you will enjoy it. Don't think that you can't do it, for we know that you can if you will but take the time.

For every such experience that we receive, provided we can use it, we will send you a copy of "Farm Engines and How to Run Them" and at the same time will give you a year's subscription to this magazine. If you are already a subscriber we will extend your subscription from the date of expiration.

Give us the name and make of your outfit, how long you have had it, how long you have been a thresherman, the number of bushels that you threshed, the price for threshing in your community; in fact tell us the whole story. If you are an old time at the business give us some of your early experiences away back in the horse power days. We have five thousand of the above books waiting for you and we want you threshermen to take advantage of them.

We want to receive enough of these letters so that we can devote a department to it each month. You will enjoy reading the experiences of others and they in turn will enjoy reading your experience. Don't delay this matter, but do it now.

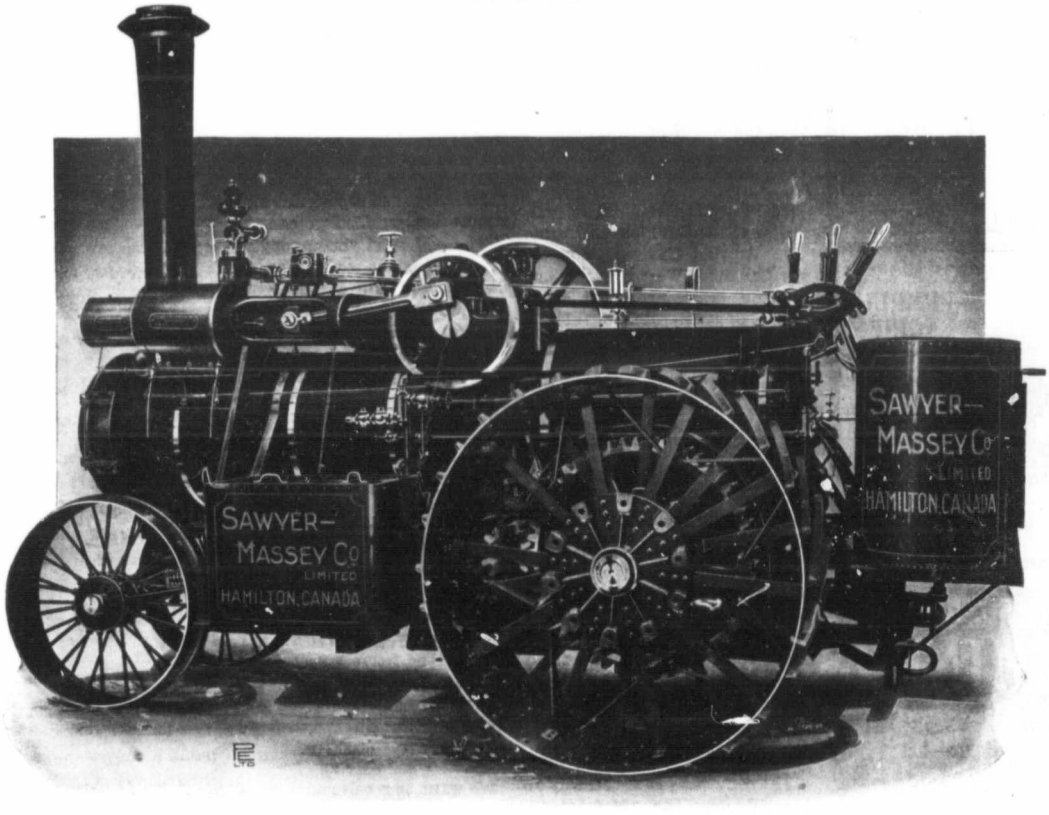
In sending in your letters if you have any photographs of your threshing outfit let us have them. We can make this department one of the best features of our paper, but without your help it will be impossible, and by the way, in addition to the above offers, to the first two hundred that send in their experiences we will send a beautiful embossed button that you will enjoy wearing in the lapel of your coat.

Address all your letters to The E. H. HEATH CO., Limited.

RECIPROCITY!

This Word Defined Means an Even Exchange of Products

Do You Understand This? It also means that if you have the Money we have the Goods.



Built in five sizes--22, 25, 27, 30 and 32 horse power. Our engines comply with all new Boiler Inspection Acts and carry the highest boiler pressure obtainable.

MR. READER! Are you open to consider a proposition on a plowing engine?

Our line of Steam Plowing Engines is absolutely unequalled—either from a price standpoint—or judging by results.

We know it! And we want you to know it. Will you let us tell you?

LOOK! On page 32 there's a picture of the Sawyer-Massey field staff. We are proud of it. Every man is a hustler and ready to give you the latest facts about Sawyer-Massey Machinery.

Each man is able to do this because each man has been properly, correctly and thoroughly taught the truth regarding our machinery.

A simple request for information will bring you the desired answer.

DON'T DELAY WRITE IMMEDIATELY

SAWYER-MASSEY CO.

Winnipeg, Man. LIMITED

The Largest Engine, Thresher and Road Machinery Manufacturers in Canada

A MAGAZINE FOR THE FARM AND HOME

THE CANADIAN THRESHERMAN AND FARMER

Vol. XVI. WINNIPEG, CANADA, MARCH, 1911. No. 3.

Canada Wins World's Sweepstakes for Oats

Some of the States from which our Canadian Northwest has been drawing many excellent settlers are chagrined to the border of hysterics over their loss of good men. It seems necessary only to show facts to establish the wisdom of the choice of our new friends. For those who come to see the country it is easy to come to a decision. Few go back dissatisfied; but it is a long job, as anyone engaged in the immigration business can assure us, to bring a man several hundred miles to see a new country that is being loudly decried by the press of his state. A man may or may not believe the stories of yields claimed for this country. He cannot know unless he measures the land and is present at the threshing, or at best be able to accurately estimate the probable yield of a standing crop.

* * * * *

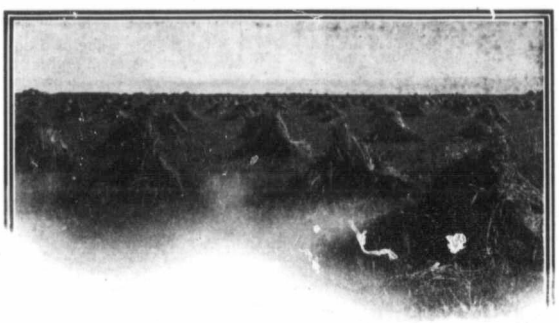
Once get a man who knows into a field of grain ready for the binder and the "where to locate" is quickly in his mind. Thus the getting of a man into the country by some tangible, unimpeachable evidence of the land's productiveness is a work of the highest moment.

* * * * *

In 1882, in Paris, France, Manitoba wheat won in a world-wide competition, and an unknown country came into notice of those who saw and those who read. Many were attracted by that premium who might not have heard of Western Canada as a wheat-growing country for one or more decades. As years rolled on, the quality of our wheat was the lodestone that drew the investigators and the restive so far from their former homes, into places where a man might be lost for days under a cloudless sky, with horses travelling seven miles or more an hour in one direction, so far were human habitations apart. Among the achievements of late years the success of the Lethbridge wheat at the Dry Farming Exposition of 1909 gave Western Canada a pre-eminent position in the eyes of thousands who would otherwise know little about us. It will be remembered that on that occasion the exhibit was a carload, and samples were given away. Talk of "setting a sprat to catch a mackerel," these gifts were worth a dollar an ounce to donors and recipients both.

* * * * *

There are iron mines of great richness that do not pay to work because of their distance from a suitable fuel. Coal and iron are both enhanced in value if in close proximity. In a measure it is the same with wheat and oats, in regard to land where one or the other is a paying crop. Hitherto, wheat has been our king, and in 1910 no one success in the exhibition of that cereal could do much more than corroborate previous demonstrations. However, in 1910, Western Canada has taken new ground and lays claim to notice on the quality of her oats. It was no mere being "in the money," or an "also ran," nor yet was it a series of first prizes at local or provincial shows. This time an enterprising grain grower of Saskatchewan went further afield for fresh laurels.



Miles and Miles of Oats.

* * * * *

The products of 1910 were exhibited at the National Seed Grain Exposition, at Columbus, Ohio. Messrs. J. C. Hill & Son, of Lloydminster, Sask., entertained the happy idea of making an entry of oats—oats which, it is likely, neighbors admitted were very fair (for neighbors on neighbors' farms are not very clamorous optimists), but Messrs. Hill, possibly not quite duly appraising their crop, decided to go to a far country for high honors. Messrs. Hill attained results beyond their anticipations, or they were optimists of a very pronounced order. The reward was the sweepstakes for oats at an United States National Exposition—a valuable attainment for the exhibitors, and they may well be proud of it. The firm no doubt has seed oats for sale from the same field where the prize stuff was grown. There should be no difficulty in getting a good price for them, and the prestige gained is a good asset; but the community in which these exhibitors live, their province and the Dominion at large are far greater gainers in the long run.

* * * * *

As all grain raisers must be interested in the system of cultivation by which such crops are produced, the Canadian thresherman requested Messrs. Hill to describe their modus operandi.

The reply was as follows:

"Lakeside Farm,
Lloydminster, Sask.

13th Feb., 1911.

E. H. Heath Co., Ltd.

Gentlemen.—

"The piece of land upon which these oats were grown was broken 4 inches deep, during the second week of June, 1909, and was rolled immediately the breaking was finished. Directly we had finished binding that season, the breaking received two strokes with the disc harrow, and was left in that condition through the winter. As soon as possible the following spring (1910) this land received one stroke with the drag harrow followed by two strokes with the disc harrow cornerwise of the field. This was followed by two strokes with a plank drag, the first one lengthwise of the furrows, the next going straight across, and by this time the field looked like a planed board. This patch was seeded on May 4th, with five bushels by measure of English Abundance oats, drilled 2½ bushels each way of the field.

"These oats, when cleaned for seed, weighed 48 lbs. per bushel, which made a total of 240 lbs. of seed per acre. After seeding, the land received one stroke with the harrows, which finished the work received by that crop. The crop made very fair growth considering the dry season, and was dead ripe all over the field by Aug. 15th, about which date it was cut and stooked, after which it had several showers on the stook which resulted in the grain being somewhat discolored, but only very slightly. The grain was in the stook for six weeks before being threshed, and from 18 acres we threshed 1,280 bushels, a little over 71 bushels per acre. On the summer fallow of 1909, cropped with oats in 1910, sown 3¼ bushels per acre, we had a yield of 82 bushels per acre, but we have yet to determine whether the difference in yield was due to rate of seeding or to the greater moisture content in the summer fallow.

Yours truly, J. C. Hill & Sons.
Per Geo. Hill."

* * * * *

It is very evident that work was not spared. Four inch breaking, rolling, drag harrowing twice, disc harrowing four times, is pretty assiduous attention, and seven bushels is a lot of seed. Does it pay? Well, what about the yield? 71 bushels per acre? Does that pay? No doubt about it. But this 71 bushels was not ordinary oats. It took the sweepstakes at the National Seed Grain Exposition, and will be in demand for seed, if we do not overestimate the business sense of our western farmers. Mr. Hill says his field was like a planed board, and the whole crop was dead ripe at one time. A very natural sequence after all the discing. There were no half ripe heads to shrivel and go light. The seeder buried all the seed at equal depth. It would be a tremendous rain that ground in that shape would not absorb as it fell. Then all parts would start at once and have an equal share of moisture. That was the secret of the even ripening and the absence of imperfectly ripened or shrivelled grain of the fine sample produced. The percentage of germination in such grain should be very high.

* * * * *

There are plenty of seed fairs throughout the country where one may easily learn the requirements of prize-taking grain. The success of Messrs. Hill & Sons should induce fifty farmers in our northwest provinces to enter grain at this National seed grain show, held in the centre of a district which is supplying our country with first class settlers. For every man who has come there are ten thinking of it, and every prize taken may be the one argument needed to clinch the decision to move to the place the sample was grown.

The Power Problem and the Farmer

By E. P. EDWARDS.

This Doesn't Solve the Power Problem

The beginning of the Twentieth Century will stand out in history as an age of marvelous achievement and any one development must indeed be most remarkable to attain individual prominence.

Nevertheless, it is asserted, without fear of valid contradiction, that the progress of scientific agriculture and the electrical development of the last decade will stand out in bold relief as pre-eminnent examples of our wonderful accomplishments, and it is believed that each has need of the other and that the closest co-operation and relationship should exist between them.

In comparison with other world movements the science of agriculture has lain dormant for centuries past, and not until the last few years has it moved forward at a pace commensurate with its importance and taken that place which rightfully belongs to it as the principal factor in our cosmos.

This recent awakening has not been brought about solely or directly because of the increasing demands made upon our sources of food supply by an increasing population and its expanding requirements. This demand has always outstripped our resources. This advancement has been brought about through scientific treatment of the problem which confronts us.

We are now rapidly reaching a solution of this problem and a few years more will see the abandonment of century old and primitive methods that have prevailed, and the substitution of rational, scientific, business principles.

Who is bringing about this most desirable change? The practical student of Agriculture, the graduate of our Agricultural College, is principally responsible.

He is taught the value of crop rotation as a means of preserving soil productiveness;

He is taught the value of proper seed selection and fertilization;

He is taught the proper method of cultivating the soil;

He is taught the value of drainage and irrigation;

He is taught the value of proper supervision in the selection and retention of live-stock;

He is taught the value of properly laying out his farm and farm buildings;

He is taught how to market his product.

But over and above all he should be taught, and is being taught, the value of business methods and the application of those methods to his needs.

After all is said, his aim is to secure the greatest returns from the least investment and by "returns" is meant not only financial prosperity, but physical comfort and happiness as well.

Let us repeat that the Agricultural College is bringing all this about, and bringing it about in a sane, conservative way.

This paper has been prepared with the hope that the suggestions contained in it may be helpful to a speedier solution of the problem, and an effort will be made to point out a neglected but vital phase of the situation and an obvious remedy.

The Agricultural Engineer has apparently overlooked the growing importance of mechanical power as an adjunct to his line of work.

Millions of dollars have been expended by our agriculturists in the investigation of plant life phenomena and in the dissemination of the knowledge so gained, but how much has been spent by the farmer in the study of the power problem which confronts the farmer? Relatively nothing. His expenditures in this direction can be charged up principally to experience. Why should the farmer spend money for the study of this problem? Because the

Nor This

great developments in all other lines outside of farming have been brought about through a comprehension of power and its economic application. Because the problem is real and vital to the farmer as well as to the rest of mankind. Because the farmer, as a class, is our greatest user of power in its many forms, but the power that he uses is not on a par with that of modern progress, considered from the standpoint of efficiency and economy.

The census of 1900 estimated that there were over 29,000,000 people in the United States engaged in gainful pursuits. Of this number more than 10,000,000 were devoting their energies to agriculture. This means man power.

The same census estimates the number of horses and mules at over 29,000,000, of which 89% were utilized in Agriculture. This means horse power.

To-day most of the mechanical power used on our farms has the gasoline engine as its source. There are approximately 400 manufacturers of gasoline engines in the United States and most of their product finds its way to the farm, one manufacturing concern alone selling over 30,000 gasoline engines a year to the agricultural trade. This means mechanical power.

In additon, the farmer utilizes steam, water, producer gas, crude oil, kerosene, alcohol and waste products generally, as a source of power.

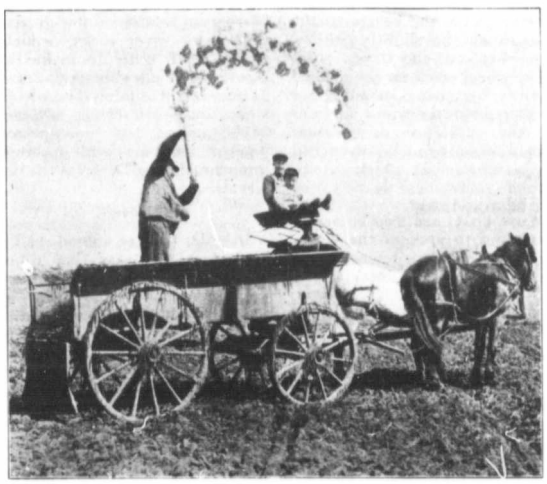
We know that the farmer finds use for a greater variety of implements and mechanical contrivances than almost any other industry.

Is he operating these implements and contrivances most economically? To-day, he does not know. To-day he is at the mercy of every manufacturer engaged in the building of power apparatus. He must buy power apparatus on faith and with experience only as a teacher. The reputable manufacturer endeavors to meet his needs to the best of his ability with reliable apparatus, but is hampered in his endeavors through his ignorance of those needs.

Why should the farmer remain in ignorance on this vital subject? Certainly not because he is incapable of comprehending it. It is absurd to say that any man who is capable of understanding the intricacies of agriculture, as it is now taught, is incapable of understanding the power problem and its practical applications, if he is given the opportunity to make a study of it.

Our great universities are turning out electrical, mechanical and agricultural engineers by the thousand, but there is too little co-operation between these three student bodies.

The Electrical and Mechanical Engineer is usually ignorant of matters agricultural, and can probably afford to be, in a majority of cases. The Agricultural Engineer is almost equally ignorant of matters pertaining to electricity and mechanical applications of power, but he should be led to feel that he cannot afford to remain in ignorance.



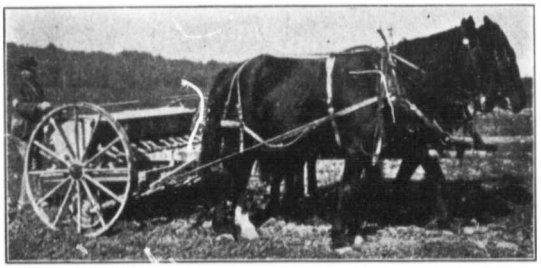
Out of Date Years ago.

Let us refer to Bulletin No. 73, issued by the U. S. Department of Agriculture in collaboration with experts in the Minnesota Agricultural Experiment Station. The bulletin is entitled "The Cost of Producing Minnesota Farm Products, 1902-1907." It comprises 69 pages of valuable information dealing with "Agriculture and the Science of Business."

A study of this bulletin will show that the greatest stress is laid on the necessity for determining cost of production in the most accurate way and this necessity cannot be too strongly emphasized, but while elaborate data has been accumulated in an effort to determine the "cost per hour" of farm labor, expressed in man power and in animal horse power, the whole subject of mechanical power has been treated in the most casual way.

The writer is not prepared to believe that a sharp dividing line exists between the power needs of our urban and rural population. He does believe that mechanical power can be made to benefit the farmer to the same extent that it has benefitted his city brother.

It is not asserted that mechanical tractors are better suited or more economical for the work in hand than the horses which they supersede. It is not asserted that the stationary engine used for pumping, feed grinding, threshing, churning, hoisting, etc., etc., is more satisfactory or economical than man power, but it is asserted that in other walks of life, both man power and horse power have been superseded by mechanical power, to a relatively much greater extent than on the farm and there must be some good reason for it. The manufacturer thinks that power can be applied to farming methods as advantageously as it has been applied to other industries, but neither the manufacturer nor the farmer knows just how it should be applied or where it should be applied.



Still in the Ring. Watch Our Next Issue for a Better Way

Who is it that should bring the farmer and the manufacturer into closer touch? It is the Agricultural Engineer, and the Agricultural Engineer will be an engineer in name only, until he has mastered the power problem.

To-day the farmer can purchase a power plant of the same horse power rating at prices ranging between $10 and $300 per unit of power. Why this discrepancy? What does it mean?

It means that there is no reliable standard to which the farmer can pin his faith. Who will determine upon such standard? The Agricultural Engineer should be the one to do it.

A further study of the typical bulletin above referred to will show that he has not yet realized the necessity for doing so. This bulletin dismisses the whole subject of mechanical power with a bare statement showing the depreciation of farm implements, and states that "the various factors which enter into the cost of producing the field crop may be enumerated as follows:—Man labor, horse labor, values consumed in farm machinery, seed, twine, etc., and the rental value of land."

But what has electricity to do with this discussion, and why was it mentioned side by side with the science of agriculture? Simply because it seems to the writer that the two sciences should go hand in hand, and it is his belief that electricity will do for the farmer what it has done for our manufacturing industries.

Let us mention a few things that electricity has accomplished. It has given us means for rapid and convenient communication in the telephone and telegraph. Without these devices the farmer would be isolated to a degree. He could not keep in touch with his markets or with weather conditions.

With these exceptions, electricity has been of little direct benefit to the farmer until the development of our irrigation projects, which extensively employ electricity.

On the other hand consider the numberless benefits derived from electricity by our urban inhabitants and manufacturing industries. They have harnessed a power possessing the greatest flexibility and adaptability.

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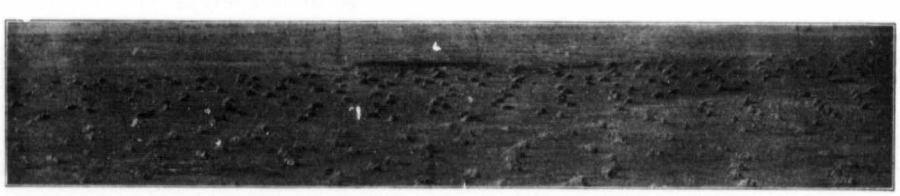


Roads for Everybody

The grade is the most important factor to be considered in the location of roads. Steep grades should always be avoided if possible. They become covered at times with coatings of ice or slippery soil, making them very difficult to ascend with loaded vehicles as well as dangerous to descend. They allow water to rush down at such a rate as to wash great gaps alongside or to carry the surfacing material away. As the grade increases in steepness the load has to be diminished in proportion, or more horses or power attached. If a horse can pull on a level 1,000 pounds, on a rise of:

1 foot in		Pounds
100 feet, he draws	.....	900
50 ditto	ditto	810
44 ditto	ditto	750
40 ditto	ditto	720
30 ditto	ditto	640
25 ditto	ditto	540
24 ditto	ditto	500
20 ditto	ditto	400
10 ditto	ditto	250

with the same effort.

Drainage.

An essential feature of a good road is good drainage, and the principles of good drainage remain substantially the same whether the road be constructed of earth, gravel, shells, stones, or asphalt. The first demand of good drainage is to attend to the shape of road surface. This must be "crowned," or rounded up toward the centre, so that there may be a fall from the centre to the sides, thus compelling the water to flow rapidly from the surface into the gutters, which should be constructed on one or both sides, and from there in turn be discharged into larger and more open channels. Furthermore, it is necessary that no water be allowed to flow across a roadway; culverts, tile, stone, or box drains should be provided for that purpose.

In addition to being well covered and drained, the surface should be kept as smooth as possible; that is, free from ruts, wheel tracks, holes, or hollows. When water is allowed to stand on a road, the holes and ruts rapidly increase in number and size; wagon after wagon sinks deeper and deeper, until the road finally becomes utterly bad.

The wearing surface of a road must be in effect a roof; that is, the section in the middle should be the highest part, and the travelled roadway should be made as impervious to water as possible, so that it will flow freely and quickly into the gutters or ditches alongside. Where the road is constructed on a grade or hill, the slope from the centre to the sides should be slightly steeper than that on the level road. Every wheel track on an inclined roadway becomes a channel for carrying down the water, and unless the curvature is sufficient these tracks are quickly deepened into water courses which cut into and sometimes destroy the best improved road.

Water Breaks and Side Ditches.

In order to prevent the washing out of earth roads on hills, it sometimes becomes necessary to construct water breaks; that is, broad, shallow ditches arranged so as to catch the surface water and carry it each way into the side ditches. Such ditches retard traffic to a certain extent, and often result in overturning vehicles; consequently they should never be used until all other means have failed to cause the water to flow into the side channels; neither should they be allowed to cross the entire width of the road diagonally, but should be constructed in the shape of the letter V. This arrangement permits teams following the middle of the road to cross the ditch squarely and thus avoid the danger of overturning. These ditches should not be deeper than are absolutely necessary to throw the water off the surface, and the part in the centre should be the shallowest.

A Straight Path But Not a Narrow One.

Where the road is built on a grade, some provision should be made to prevent the wash of the gutters into great, deep gullies. This can be done by paving the bottom and sides of the gutters with brick, river rocks, or field stones. In order to make the flow in such side ditches as small as possible, it is advisable to construct outlets into the adjacent fields, or to lay underground pipes or tile drains with openings into the ditches at frequent intervals.

Subdrainage.

In order to have a good road it is just as necessary that water should not be allowed to attack the substructure from below as that it should not be permitted to percolate through it from above. Under drains are not expensive. On the contrary, they are cheap and easily made, and if made in a substantial way and according to the rules of common sense, a good under drain will last for ages. Slim fagots of wood bound together and laid lengthwise at the bottom of a carefully graded drain ditch will answer fairly well if stone or drain tile cannot be had, and will be of infinite benefit to a dirt road laid on springy soils.

Subdrains should be carefully graded with a level at the bottom to a depth of about 4 feet, and should have a continuous fall throughout their entire length of at least 6 inches for each 100 feet in length. If tile drains can not be had, large, flat stones may be carefully placed so as to form a clear, open passage at the bottom for the flow of the water. The ditch should then be half filled with rough field stones, and on these a layer of smaller stones or gravel, and a layer of sod, hay, gravel, cinders or straw, or if none of these can be had, of soil. If field stones or drain tile can not be procured, satisfactory results may be attained by the use of logs and brush.

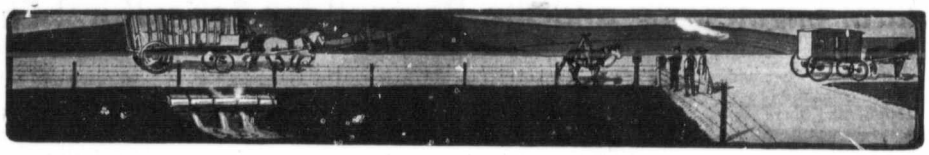
Earth Roads.

Earth is the poorest of all road materials, aside from sand, and earth roads require more attention than any other kind of roads, and, as a rule, get less. At best, they possess so many defects that they should have all the attention and care of which their condition is susceptible. With earth alone, however, a very passable road can be made, provided the principles of location, drainage, and shape of surface, together with that of keeping the surface as smooth and firm as possible by rolling be strictly adhered to. In fact, a good earth road is second to none for summer travel and superior to many of the so-called macadam or stone roads.

"Water is the great road destroyer," and too much attention can not be given to the surface and subdrainage of earth roads. The material of which their surfaces are composed is more susceptible to the action of water, and more easily destroyed by it than any other highway material. Drainage alone will often change a bad road into a good one, while, on the other hand, the best road may be destroyed by the absence of good drains.

If loose earth is dumped into the middle of the road and consolidated by traffic, the action of the narrow-tired wheels cuts it or rolls it into uneven ruts and ridges which hold water, and ultimately results, if in the winter season, in a sticky, muddy surface, or if it be in dry weather, in covering the surface with several inches of dust. If, however, the surface be prepared with a road machine and properly rolled with a heavy roller, it can usually be made sufficiently firm and smooth to sustain the traffic without rutting, and resist the penetrating action of the water.

In constructing the new earth roads, all stumps, brush, vegetable matter, rocks, and boulders should be removed from the surface, and the resulting holes filled in with suitable material, care-



fully and thoroughly tamped or rolled before the road embankment is commenced. No perishable material should be used in forming the permanent embankments. Where possible, the longitudinal grade should be kept down to 1 foot in 30 feet, and should, under no circumstances, exceed 1 in 20, while that from centre to sides should be maintained at 1 foot in 20 feet.

Roads of Sand, Sawdust, Tan-bark, etc.

Sand is the one material that is an exception to the necessity for drainage in roads. The more one improves the drainage of a sand road, the more deplorable becomes its condition. Nothing will ruin one quicker than to dig a ditch on each side and drain all the water away. The best way to make such a road firm is to keep it constantly damp. Very bushy or shady trees alongside such roads prevent the evaporation of water.

Any strong, fibrous substance, and especially one which holds moisture, such as the refuse of sugar cane or sorghum, and even common straw, flax or swamp grass will be useful. Spent tan is of some service, and wood fibre in any form is excellent. The best is the fibrous sawdust made in sawing shingles by those machines which cut lengthwise of the fibre into the side of the block. Sawdust is first spread on the road from 8 to 10 inches deep and this is covered with sand to protect the road against fire lighted from pipes or cigars carelessly thrown or emptied on the roadbed. The sand also keeps the sawdust damp. The dust and sand soon become hard and packed, and the wheels of the heaviest wagons make but little impression upon the surface. The roadbed appears to be almost as solid as a plank road, but is much easier for teams.

Roads built of poles or logs laid across the roadway are called corduroy roads, because of their corrugated or ribbed appearance. Like earth roads, they should never be built where it is possible to secure any other good material, but, as is frequently the case in swampy, timbered regions, other material is unavailable, and as the road would be absolutely impassable without them at certain seasons of the year, it is well to know how to make them. Roads of this character should be 15 or 16 feet wide, so as to enable wagons to pass each other. Logs are superior to poles for this purpose and should be used if possible.

Gravel Roads.

Where beds of good gravel are available, this is the simplest, cheapest, and most effective method of improving country roads. Inferior qualities of gravel can sometimes be used for foundations; but where it becomes necessary to employ such material, even for that purpose, it is well to mix just enough sandy or clayey loam to bind it firmly together. For the wearing surface or the top layer the pebbles should, if possible, be comparatively clean, hard, angular, and tough, so that they will readily consolidate and will not be easily pulverized by the impact of traffic into dust and mud. They

A Road that Nobody Likes

should be coarse, varying in size from half an inch to an inch and one-half.

Blue Gravel and Bank Gravel.

Where blue gravel, or hardpan and clean bank gravel are procurable, a good road may be made by mixing the two together. Pit gravel or gravel dug from the earth as a rule contains too much earthy matter. This may, however, be removed by sifting.

The best gravel for road building stands perpendicular in the bank; that is, when the pit has been opened up, the remainder stands compact and firm and can not be dislodged except by use of the pick, and when it gives way falls in great chunks or solid masses.

Stone Roads.

The practice of using too soft, too brittle, or rotten material on roads cannot be too severely condemned. Some people seem to think that if a stone quarries easily, and packs readily, it is the very best stone for road building. This practice, together with that of placing the material on unimproved foundations and leaving it thus for traffic to consolidate, has done a great deal to destroy the confidence of many people in stone roads. There is no reason in the world why a road should not last for ages if it is built of good material and kept in proper repair. If this is not done, the money spent is more than wasted. It is more economical, as a rule, to bring good materials a long distance by rail or water than employ inferior ones procured close at hand.

The durability of roads depends largely upon the power of the materials of which they are composed to resist those natural and artificial forces which are constantly acting to destroy them. The fragments of which they are constructed are liable to be attacked in cold climates by frost, and in all climates by water and wind. If composed of stone or gravel, the particles are constantly grinding against each other and are exposed to the impact of the tires of vehicles and the feet of animals. Atmospheric agencies are also at work decomposing and disintegrating the material. It is obviously necessary, therefore, that great care be exercised in selecting for the surfacing of roads those stones which are less liable to be destroyed or decomposed by these physical, dynamical and chemical forces.

Useful Stones for Road Building.

Siliceous materials, those composed of flint or quartz, although hard, are brittle and deficient in toughness. Granite is not desirable, because it is composed of three materials of different natures, viz., quartz, feldspar, and mica, the first of which is brittle, the second liable to decompose rapidly, and the third laminable or of a scaly or layerlike nature. Some granites which contain hornblende instead of feldspar, are desirable. The darker the variety the better. Gneiss, which is composed of quartz, feldspar, and mica, more or less distinctly slaty, is inferior to granite. Mica-slate stones are altogether useless. The agrillaceous slates or clayey slates make a smooth surface, but one which is easily destroyed when wet. The sandstones are utterly useless for road building. The tougher limestones are very good, but the softer ones, though they bind and make a smooth surface very quickly, are too weak for heavy loads; they wear, wash and blow away very rapidly.

The materials employed for surfacing roads should be both hard and tough, and should possess, by all means, cementing and recementing qualities. For the southern States, where there are no frosts to contend with, the best qualities of limestone are considered quite satisfactory as far as the cementing and recementing qualities are concerned, but in most cases roads built of this class of material do not stand the wear and tear of traffic like those built of trap rock, and when exposed to the severe northern winters, such material disintegrates very rapidly. In fact, trap rock, "nigger heads," technically known as diabase and diorites, are considered by most road engineers of long experience to be the very best stones for road building.

Macadam Construction.

The macadam road consists of a mass of angular fragments of rock deposited usually in layers upon the roadbed or prepared foundation, and consolidated to a smooth, hard surface, produced by the passage of vehicles or by use of a road roller. The thickness of this crust varies with the soil, the nature of the stone used, and the amount of traffic which the road is expected to have. It should be so thick that the greatest load will not affect the foundation. The weight usually comes on a very small portion of the sur-

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Agricultural Engineering and the Demand for Agricultural Engineers

By SAMUEL FORTIER.
Chief of Irrigation Investigations, U.S. Department of Agriculture.

Half a century ago engineering attracted little attention. Then only a small number of men followed this vocation, and there were few institutions which gave instruction in this subject.

It was not until after the people of the North were pitted against those of the South in a war to the death that men began to recognize the value of technical training, and to question the wisdom of compelling all college students to spend so large a part of their time in a study of dead languages and a dead past. In that terrific struggle it was the man who could do things that rose to the top. Deeds proved greater than words, and oratory, although it may have played an important part in starting the war, did little to carry it on or to stop it.

The widespread demand for an education differing from that given by the classical colleges culminated in the passage by Congress of the Land Grant Act of July, 1862. This act gave to the several states and territories public lands for the benefit of instruction in the arts and sciences relating to agriculture and the mechanic arts. In 1909, 67 of these land grant colleges had been established.

The importance of these institutions may be gathered from a few statistics taken from the annual report of the Office of Experiment Stations for 1909. From this it appears that the permanent funds and equipments of these colleges amount to 112,000,000 dollars, and the revenue from all sources, State and Federal, to over 18,000,000 dollars a year. In regard to the courses of study, and the number of students in each, one finds a larger percentage of students in the preparatory special and short courses than in the four year courses. In 1909, there were enrolled in the four year courses, 27,579 students, of whom 24,940 were grouped as follows:

Engineering	17,892
Agriculture	4,999
Household Economy	1,443
Forestry	223
Veterinary Science .	215
Horticulture	158
Total	24,930

According to the report of the Commissioner of Education for 1909, the number of engineering students at all the universities, colleges and technical schools of the United States was 31,748, or 17,892 were found in the land grant colleges and 13,856 in the state institutions other than land grant and the private technical schools.

The foregoing statistics disclose two facts that are not generally known. These are, first, that the land grant institutions are engineering rather than agricultural colleges, and second, that they are training more than 56 per cent. of all of the engineering students of the nation.

So great is the preponderance of engineering students and engineering courses in these public institutions that it would seem proper to review briefly the character of the instruction given and the courses offered in this subject. I do so on the ground that it is a matter which deeply concerns both the nation and the states and territories of the Union. The nation donated 10¾ million acres of its public lands for the benefit of instruction in the arts and sciences related to agriculture and mechanics' arts, and last year both state and Federal aid, exclusive of tuition fees, amounted to nearly 17 million dollars. I shall not attempt to discuss the right of the land grant colleges to instruct by means of state and Federal aid nearly 18,000 students in engineering, and only 5,000 in agriculture. This is not germane to my theme. I merely wish to call attention to the fact that the kind of instruction given and the courses offered in engineering do not seem to me to be in full accord with the act under which they were organized and the purposes for which they are maintained. One has but to scan the list of courses offered to find that nearly all are classified under civil, mechanical, electric and mining, with a scattering pertaining to sanitary, structural and other branches of engineering. This shows that the main activities of agricultural colleges are concentrated upon the training of civil, mechanical, electrical, and mining engineers, in competition with a large number of state universities and private technical schools. Nor is this all. In their eagerness to train civil engineers for railroad corporations, mechanical engineers for manufacturers, and hydro-electric engineers for water power companies, they are neglecting to train men for the engineering work of the farm. Only one out of 67 institutions—the Iowa State College of Agriculture and Mechanic Arts—offers a degree in agricultural engineering, and few devote much time or attention to this phase of engineering.

Now, in the brief time allotted to me I shall endeavor to outline the scope of agricultural engineering, and to indicate the need and the demand for this kind of training. As I view it, the general course may be sub-divided into six branches, three of which relate to the farm and three to agricultural communities. This tentative sub-division is as follows:

1. Farm machinery and farm motors.
2. Farm structures, including rural architecture.
3. Rural water supplies and sanitation.
4. Public Roads.
5. Drainage.
6. Irrigation.

These six major studies would, of course, be supplemented by instruction in English, mathematics, drawing, agricultural chemistry, physics, soils, surveying, and elementary engineering.

One or more of the sub-divisions of this course, as outlined, is now taught in most of the land grant colleges, but with a few exceptions, they are mere side issues to what is considered the more important work of training men to become professional engineers. The institutions of this class in the West give instruction in irrigation as part of the C.E. course. Those of the Mississipi valley have more or less complete courses in farm machinery and farm motors, while the subject of roads and pavements is included in a large number of the C.E. courses, but, as we shall see later, is chiefly adapted to the needs of the municipal engineer. Rural water supplies, farm sanitation, and farm structures are for the most part overlooked. What is urgently needed, in my opinion, is an engineering course in each agricultural college, which would combine into one the course of farm machinery and farm motors as now given in the University of Nebraska and the Iowa Agricultural College, that of irrigation, as now given in the University of California and the Agricultural College of Colorado, that of rural architecture and cement work, as given in the University of Wisconsin, and that of highway engineering, as taught at the University of Kentucky. That there is an urgent need for better and more general training for the engineering work of the farm is evidenced by the following facts which relate to the main branches of such a course as I have outlined.

Farm Machinery and Farm Motors.

According to the report of the Secretary of Agriculture, the crops of corn and cotton, wheat and oats, for the past season aggregate a value of over $3,400,000,000. All four are annual crops, requiring the preparation of the soil and subsequent operations of seeding, cultivating, harvesting and marketing. When one tries to estimate the large number of implements, machines, and motors required for a task of this magnitude, he begins to have some realization of what is annually expended by American farmers in the purchase and maintenance of this necessary equipment. The census for 1900 estimates the value of farm implements and machinery at $761,000,000, and the annual expenditure at over $100,000,000. This was ten years ago, and since then not only the number of implements and machines, but more particularly the number of motors have been greatly increased. The simple, inexpensive implements used by our fathers have been for the most part replaced by more complicated and more expensive machines. Out of the hand flail of the fifties has been evolved the steam thresher of today. The modern harvester does the work of a large number of men, women and children, equipped only with a sickle, and motors, trolley cars, and railroads have relegated the saddle-bags to the museum. These great changes during the lifetime of men still living, and more particularly the substitution during the past decade of motors for horses and mules, have created a widespread demand for young men possessing a knowledge of motors and machines, and the principles which underlie their construction and use. Studies of this character are as essential now to the ambitious farmer boy as anatomy is to the embryo doctor. The simple arts of handling a flail, whetting a scythe, or harnessing a team, have grown into a complicated business demanding not only experience and skill, but special training as well.

Farm Structures.

Some colleges now give instruction in rural architecture, others in farm architecture, and still others in cement and concrete. I have attempted to combine these under one head, and to make the subject broad enough to include such types as the design and construction of concrete drinking troughs, silos, barns and country residences. A number of the land grant colleges give a course in architecture, but like many others it is designed to draw men away from the farm. Undergraduates who are taught to design and supervise the erection of the palatial homes of the rich, find the city or its suburbs the most convenient place to practice their profession. Nearly fifty years ago, the nation provided for instruction of a kind suitable for the boys and girls on the farm, but the millions of poorly designed farm homes which still mar the landscape are mute evidence that the instruction given did not include architecture. The improvement in farm buildings so urgently needed does not call for money so much as a knowledge of how to do things. Out of the same materials and with very little extra labor may be built a pleasant, convenient, healthy and durable country home, or the reverse. The main difference is one of plan and execution.

Rural Water Supplies and Sanitation.

The contrast between rural and urban residences is still more strongly emphasized in relation to the water supplies and sanitation of each. Skilled engineers are employed to provide an ample supply of water for cities, and

equally skilled biologists determine its purity, while but little attention is given to farm water supplies and sanitation. Most of the laborious work which falls to the lot of the farmers' wives and daughters is due to the lack of proper facilities for providing a plentiful supply of fresh water and for removing the waste. Day after day and year after year the old oaken bucket is pulled out of the open well by means of a wet, dirty rope, and later on the same water may have to be carried by tired hands from the kitchen to pollute the door yard.

Farmers procure water for their needs from the same sources which supply water to the residences of cities. These are springs, wells, cisterns, reservoirs, lakes and rivers, but the training and experience necessary to utilize such sources for the benefit of the one class differ in many essentials from those of the other. The civil engineer may succeed in building a distributing reservoir for a city, and yet fail in his effort to build a cistern for a farmer. His computations for a high water tower may be correct, and those for the windmill wholly wrong in principle. It is true both belong to hydraulic engineering, but so long as engineers are trained to solve the problems of the city and to neglect those of the country, we need not expect a high class of engineering on the farm.

Farm sanitation is of even greater importance, for on it depends in no small degree the health of the farmer and his family, and to a lesser extent that of the dweller in cities. The milk can washed in polluted water from the farm well may carry disease to thousands.

The farm water supplies of Minnesota have recently been investigated by Messrs. Kellerman and Whittaker, of the Department of Agriculture, in co-operation with the Minnesota State Board of Health, and after making a careful examination of 79 typical farm water supplies of that state, they conclude their report as follows:

1. Both farm and city suffering from the careless management of rural sanitation.

2. Exhaustive data upon 79 carefully selected and typical rural water supplies shows that 20 were good and 59 were polluted. The chief cause of the polluted wells was carelessness or ignorance.

3. During this investigation 23 of the farms examined showed a record of typhoid fever.

4. The protection of farm supplies by common-sense methods obvious to anyone who will try to discover the dangers incident to his own water supply, would render safe the majority of farm supplies which are now polluted.

Public Roads.

In 1904, the Office of Public Roads of the United States Department of Agriculture collected and compiled from every county in the Union data pertaining to the mileage, revenues and costs of country roads. This information was condensed in Bulletin 32 of that office, from which the following facts were taken:

The total road mileage in the United States is classified as follows:

	Miles
Improved roads	153,664
Unimproved roads	1,997,906

The improved roads are further classified as

	Miles
Roads surfaced with gravel	108,233
Roads surfaced with stone	36,622
Roads surfaced with special material	6,810

In the same year, the total expenditures for public roads and bridges was nearly eight million dollars. This was furnished by counties, townships and districts, and included poll taxes, labor, bond issues and state funds.

The most striking feature of these statistics is the enormous extent, comprising nearly two million miles, of unimproved roads in the United States. The same authority estimates the cost of macadam roads at $4,500 per mile, of gravel roads at $1,500 per mile, and of other surfacing materials at $1,000 per mile. It is obvious that an expenditure of something like three billion dollars will be required to convert the common earth roads of this country into even good gravel roads. That this change is desirable few will gainsay; that it is necessary under modern conditions and the relations now existing between producer and consumer is also quite generally admitted. The rapid increase in urban population has greatly multiplied the demand for the perishable products of the dairy, truck farm and orchard, and the value of such products depends, to a large extent, on their speedy transportation from the country to the city. For this and other reasons the auto truck and similar product carrying motors are taking the place of the horses and cart and the farm wagon. Public sentiment in favor of better roads is rapidly spreading to each farm and hamlet. As a result of this awakening, our two million miles of earth roads cannot much longer remain in their present condition. American farmers cannot afford to pay on an average 23 cents to haul a ton a mile, when 10 cents would suffice if the highways were improved. In casting about for ways and means to bring about a change, one of the vexing problems which now confronts the States which have decided in favor of better roads, is the honest and efficient expenditure of road funds. The citizens of California recently voted to bond the state for $18,000,000 for the construction and maintenance of state highways. The majority of those opposing this measure did so on the ground that no definite plan had been worked out to show where the highways were to be built and what method of construction should be followed. Furthermore, that there was no provision in the Act for the maintenance of those roadways when built. I am of the opinion that California would receive much more benefit from the expenditure of this special fund, and that of the $2,000,000 which the state annually expends for highways, if her Agricultural College had seen fit to establish years ago a good course in highway engineering. The state engineer and other state and county officials would not now have their best efforts impaired by the lack of men competent to plan and locate, construct and maintain the public roads of the state. It is true, the University of California for a number of years has given instruction in highway engineering as part of the C.E. course, but the main purpose of such instruction is evidently designed for the benefit of the municipal engineer, in the construction of city streets and pavements, since the time given to the subject is wholly inadequate for both comprehensive study of both city streets and country roads.

The Drainage of Farm Lands.

In 1903, a committee on rural engineering, of which the writer was a member, was appointed by the Association of American Agricultural Colleges and Experiment Stations to prepare and submit a report on this subject. From this I quote the followin:

The marsh and overflowed lands along our sea coast, and the bottom lands bordering many of our rivers are at present unsightly, unproductive, and in some instances, a menace to the health of surrounding districts. They need only to be diked and drained to be the most valuable lands in the country. The carrying out of these improvements will add immensely to the agricultural values of the country, and the work is certain to be undertaken in the near future. It involves, a larger knowledge of agricultural engineering than can now be obtained in our land grant colleges. In fact, the profession of agricultural engineer, so prominent in Europe, is almost unknown in this country. Very little has been done in this country to develop a satisfactory drainage practice. The principles of drainage are understood by but few, and instruction in our colleges is meagre and far from being up-to-date.

Since the above was written, and in response to a resolution of the United States Senate of December 9, 1907, more definite information has been collected on this subject by Mr. C. G. Elliott, Chief of Drainage Investigations, of the Office of Experiment Stations. Mr. Elliott classified the unreclaimed swamp, overflowed and wet farming land of the United States, and estimates their extent as follows:

	Acres
Permanent swamp lands	52,665,020
Wet grass lands	6,826,019
Periodically overflowed lands	14,747,805
Periodically swampy lands	4,766,179
Occupied farm lands needing drainage ..	150,000,000
Total	229,005,023

In showing the effect of draining swamp lands on public health the pamphlet recites many instances where the number of deaths from malaria had been greatly reduced as a result of drainage. The benefit to agriculture from the same causes are placed so high in the millions as to be well-nigh incomprehensible. Perhaps the most surprising thing about this inquiry is that each state in the Union is in need of drainage. The figures giving the total extent, exclusive of occupied farm lands, varies all the way from 8,000 acres in little Rhody to nearly 20 million acres in Florida.

Irrigation.

Of even greater importance is the subject of irrigation. Two-fifths of the United States is arid, and the remaining three-fifths, although humid, is subject to periodical droughts, during which crop failures can only be averted by artificial watering. In the past ten years, nearly 16 million people have been added to our population. The public lands suitable for cultivation in their natural state have been taken up, and the farms for the future millions must be wrested from the desert by irrigation or from the swamps by drainage. About 13 million acres of desert land have been reclaimed. The water which is applied to this area each crop-growing season would cover the whole of New England to a depth of 15 inches. The handling of this enormous volume, its distribution over widely scattered areas, and the preparation of the surface of fields so that water may be spread evenly over them call for an amount of experience and skill not equalled in any other branch of agriculture. Western farmers deserve great credit for the lands they have reclaimed, but their task is not completed. So great is the waste of water that from 50 to 100 per cent. more land might be reclaimed if the waste water were saved and utilized. It is, however, if the farmers will accomplish this reform by their unaided efforts. They have gone about as far as they can without the assistance and supervision of the trained specialist. All over the irrigated West, from every district and from nearly every farm, and also from the drought stricken states in the East and middle East comes the call for help. How shall I line my ditch to prevent loss from seepage? How much water is needed for this and that crop? When should it be applied? How shall I prepare my fields so that the ditch water will moisten the soil uniformly? and what is the most suitable device for measur-

Continued on page 28

The Engine Gang That Wins the West for Wheat

YOU BUY WHAT MOST OTHERS ENDORSE AS BEST

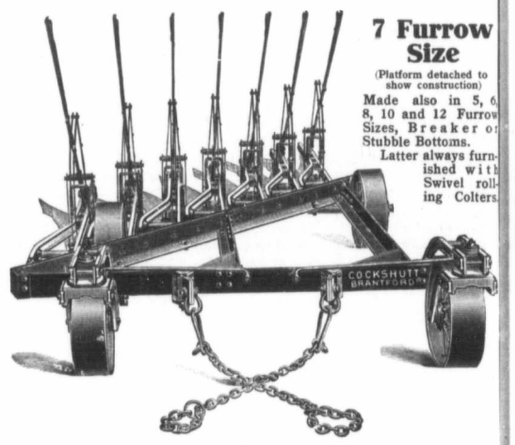
THREE out of every four Engine Gangs are Cockshutt Make because they fit Canadian Conditions. They do not pack clay bottom watertight, making land sour. They operate singly. They pass over stones automatically, the one plow affected rising and again setting itself. They do not wing, having a double, straight strong head with wide bearing at frame. Long levers give prompt lift at land ends. Pivoted, wide steel wheels at front give quick turn. Plows in line of the tractor tread plow the wheel ru to set depth. A set screw adjusts each plow to exact amount of dip. Plows adjust themselves to uneven land. No Engine Gang so satisfactorily turns the furrows as the Cockshutt in stubble, hard clay or prairie.

See the Cockshutt Engine Gang.

SEE THE Cockshutt Dealer

THE COCKSHUTT ENGINE GANG has one plow unit to a double, straight head, hinged at a wide bearing to the platform frame. The single plow unit (instead of two to a single bar) operates independently, passes over rocks or obstructions and again sets itself without interfering with the other plows. The double-bar head, straight and not arched to make least possibility of twisting under strain, holds the plow unit absolutely in line. A set screw adjusts the share of each individual plow.

The plows adjust themselves to the most irregular ground and to depressions of any depth from tractor wheels. These depressions are plowed to full depth by the Cockshutt Engine Gang. Depth of plow units is set by broad-tired gauge wheels and plows will not rise in hard ground.



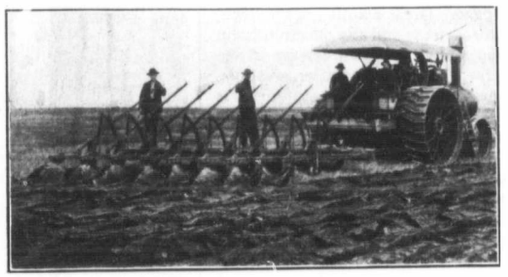
7 Furrow Size

(Platform detached to show construction)

Made also in 5, 6, 8, 10 and 12 Furrow Sizes, Breaker or Stubble Bottoms. Latter always furnished with Swivel rolling Colters.

The Cockshutt Engine Gang

In the early days of gang plows there was some truth in the statement farmers sometimes made, namely, that better work could be done with a horse plow than with a gang plow. At that time gangs were made with a rigid beam which would not allow the plows to follow inequalities of ground. Some are still made that way to a greater or lesser extent. The plows were held rigidly upon an exact level and on uneven land one plowed deep while another skimmed the surface. That is not possible with the flexible, yet powerful, construction of the Cockshutt gang of to-day. It has independent plows on individual beams so that every plow does its own work, each one follows inequalities of ground as met, hollows are plowed at same uniform depth as higher spots. More than that, these plows are strongly and accurately fixed at exactly the same space apart and furrows never vary in width. Every farmer knows an engine permits straighter furrows being plowed.



Read our free booklet on

"Horseless Plowing"

You get the facts

SPEEDY AND CLEAN PLOWING is the Cockshutt Engine Gang standard. The automatic action of each plow unit saves attention. Each plow is operated by single levers of extra length, requiring little effort, and allowing speedy operation of levers.

Quick turning at ends of lands is a feature. The swivel mounted front wheels to platform allow short turns. The large platform allows quick manipulation of levers. The swivel tractor connection allows short hitch to tractor, developing maximum power of tractor at the plow, and by extra length of furrow at ends of lands, permits shorter end lands.

SEE THE Cockshutt Dealer

The 5-plow Engine Gang develops best capacity of small tractors, and the larger sizes allow increased capacity, a 12-plow Cockshutt Gang requiring about the same power as an ordinary 10-plow gang with plows set in pairs. In case of accident, plowing need not stop, as a few minutes' work allows an outside plow to be set in, and work continued one furrow narrower until repair is made on the broken unit.

Three out of Four Engine Gangs are Cockshutt's—Quality does it.

COCKSHUTT PLOW COMPANY LIMITED WINNIPEG

BRANDON REGINA SASKATOON CALGARY EDMONTON

COCKSHUTT PLOW COMPANY LIMITED WINNIPEG

BRANDON REGINA SASKATOON CALGARY EDMONTON

MAR.

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

1911

"Everything begins and ends with the soil."

A PLAIN TALK TO OUR ADVERTISERS

OUR GUARANTEE

No advertisement is allowed in our columns until we are satisfied that the advertiser is absolutely reliable and that any subscriber can safely do business with him. If any subscriber is defrauded E. H. Heath Co., Ltd., will make good the loss resulting therefrom, if the event takes place within 30 days of date advertisement appeared, and complaint be made to us in writing with proofs, not later than ten days after its occurring, and provided, also, the subscriber in writing to the advertiser, stated that his advertisement was seen in "THE CANADIAN THRESHERMAN AND FARMER." Be careful when writing an advertiser to say that you saw the advertisement in "THE CANADIAN THRESHERMAN AND FARMER.

THIS is simply a plain talk to our advertisers—it is neither a vindication of our position nor a criticism of others. It is given largely to show that the path of success lies always on the upward grade; that there are some mortals in this world who attempt to climb by traversing the gutters of the successful man's road rather than striking out for themselves.

The publishing of a newspaper or a magazine is a business. Manufacturing flour or plows is a business. It is a matter of placing reading matter on a printed page that is of the kind and stamp that people want and will cry for more. It is a question of producing something.

Two things are necessary in the modern publication, viz., subscribers "as distinguished from readers" and advertisers. Subscribers are absolutely necessary. Advertisers will come through efficient service rendered. The advertiser may feel that when he gives an order for space he is buying a certain amount of thin air. It is true that what he is buying is not as tangible as an engine or a suit of clothes, but if he will but stop and think he is buying the privilege of conveying a message to such people as the publication in which he orders space reaches,—nothing more, nor less. He is not buying space to reach readers. Theatre programs and bill boards do that. When he buys space in an up-to-date magazine he buys it to reach people who have paid their good money for a publication because they want it; people who have faith in it, who believe in what it says and who give the advertisers in that publication first consideration when it comes to purchasing goods.

It is a practice of some publications to continue their subscribers after the date of expiration. Let us look into this matter.

Supposing you went to a hat store and bought a hat. We will assume that the life of this hat was six months. Would you consider it good business policy for that hat store at the expiration of that period to send you another hat and expect you to pay for it simply because you had bought there once? It is perhaps not a parallel case but is true to a greater or less extent in the case of a newspaper. Simply because a man has subscribed for a newspaper once, is it fair to assume that that paper is to be forced upon him whether he wants it or not? Is it fair to assume that he will feel towards that publication the same as he does towards one which he has ordered and for which he has paid his good money? The kind of circulation that an advertiser wants is the kind of circulation that will read the paper in which you place your advertisement; otherwise the money you pay for space is a donation to charity.

Another thing. You as an advertiser and as a business man choose your company; likewise you want the goods that you sell and the name that your company carries to choose its company. When you place your advertising do you always stop to consider the fact that your advertisement may not be next to the very best of company? Haven't you sometimes found that the company it was obliged to keep in some publications was somewhat undesirable, that certain advertisements in those publications bore the hall-mark of a fake? Supposing that some of the subscribers of that publication were bitten by those same fake advertisements, don't you believe that to a certain extent, it would spoil the effect of your own ad? A man is known by the company he keeps; likewise the advertisement.

The advertiser of today is being besieged on all sides by new publications. He is exhorted, patronized, cajoled, begged and threatened for advertising space. Great claims are set forth, flagrant promises made and any old circulation sworn to in exchange for an order for advertising space, for which the advertiser must pay his good money. A very frequent statement is "We have just as good a publication as so-and-so. You patronize that publication; consequently it is up to you as an advertiser to patronize us." Instead of talking the merits of their own publication such "clap trap" periodicals seek to fill their own advertising columns by tearing down or discrediting those who have served the advertising public, and served it well for years, and who have succeeded in building up more advertising than the aforesaid publications are actually carrying.

Let some of the older publications embark upon a campaign for new subscriptions and this "touted" following will immediately attempt to discredit its sincerity, both by word of mouth to every advertiser with whom they can gain an audience and through their own columns.

Let some of the older publications get out an unusually large issue from an advertising standpoint, and immediately there will be rumours started by the above brand of publishers of "free space," "rebates" and many other similar expressions. They generally come to you with a story that "they know" as they are in the "confidence of" practically every advertiser; while on the other hand you will find that these same advertisers have not returned their "confidence" to the extent of giving them space, at least not in any appreciable quantity.

Do you as a business man advise your salesman to secure business by knocking the other fellow? If you should find out that an order had been secured in this way do you feel very good about it? Doesn't your conscience hurt you somewhat? The order that makes you feel good is the order that was secured on the absolute merits of the goods sold. You know that such business is legitimate, and when secured in this way will stick.

This is not meant as a criticism upon any new publication. Canada is a free country and anybody and everybody has a perfect right to engage in any business that they may find to their liking. As we have stated before, advertising space is an intangible thing and the advertising salesman can put it up to you in such a way that it may look good. The new publication that comes to you with a circulation of twenty or twenty-five thousand as a starter is telling you a pretty big story and one that bears very close investigation. We know whereof we speak.

We have spent in the past year in cold hard cash very close to fifteen thousand dollars on circulation and we want to say to you right here that we didn't put on twenty thousand new subscribers; no, we didn't put on ten thousand new subscribers. We want to

Continued on page 85

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.

IMPORTANCE OF FARM MACHINERY

By John G. Rayner.

When we speak of the importance of the farm machine upon the farm we are dealing with a subject on which depends to a very large extent the greatness and prosperity of the individual, the country and the Empire. In the small space to be devoted to this article it would be impossible to deal fully and justly with each detail of a subject of such magnitude and importance, but it is the purpose of this article to endeavor to impress upon all those interested, the indispensable position which the farm machine commands, not only with the agriculturist but with the nation as a whole, embracing, as it does both its present and future wealth and prosperity.

In Canada, perhaps more than in any other country, is the farm machine the main outstanding factor upon which depends the future greatness of the country because of the immense areas of first-class land yet to be taken up and cultivated and made to produce cereals which are increasing in demand continually and without which no nation can thrive. The products of the farm are the pillars which must inevitably elevate and hold Canada to a position which can never be attained by any other country and from where she will be called upon to supply the world with wheat which is rightly called the staff of life. To do this calls for an equipment of farm machinery upon the farm which will enable the farmer to produce immense quantities of farm products with the least possible expense and time and which will lessen the great demand for men and horses to operate the various machines, thus calling for improvement along the line of farm motors. The time must soon come when mechanical motive power will largely displace horses and the work on the land will be done almost exclusively by either steam, gasoline or electrical power, thus increasing the amount of work done and lessening the amount of men required.

Very few persons seem to realize the importance of the development of modern farm machinery and its effect on the development of a country. The success of the agricultural profession depends almost wholly on the obtaining of the largest possible results at a minimum of cost and it is because of the liberal use of farm machinery that this country has become so great agriculturally. Farm implements will be more important in the future because it is through them the farmer reduces the cost of production. By doing the work more satisfactorily and easily, and economizing human labor, they increase a man's capabilities and in many cases enable him to produce crops of finer quality. It is often said that a man is known by the implements he keeps and the truth of this statement is becoming more and more apparent.

The greatest factor determining the value of machinery in its adaptation to purpose, and the care given to it often determines the length of its period of usefulness. Although farm implements have undergone such rapid development that development has only added to their complexity and rendered their operation more difficult. Comparatively few farmers understand the laws and principles governing the construction and operation of farm machines and, therefore, are not able to use them in such a way as to secure the greatest possible efficiency.

Perhaps the most important implement on the farm is the plow. Its gradual evolution has kept pace with the advancement of the human race. It is mentioned in the Bible and has been undergoing changes and improvements ever since. Although not so complex as many other implements, yet to operate it properly requires a very thorough knowledge of the principles governing its construction to make it do the best work. The plow has steadily undergone improvement but until about the middle of the last century its real purpose of pulverizing the soil was practically unknown. The first plows merely scratched the soil, later ones loosened it a little more, while the modern plow inverts the soil completely with a great pulverizing effect and is an implement of much beauty and capability when handled intelligently. Necessity is the mother of invention and the rapidly increasing demand for the products of the farm have necessitated the making of larger plows, such as the double and triple-furrowed gang, and later on heavy plows to be operated by steam or gasoline power, turning over a number of furrows and plowing from 20 to 100 acres per day, as compared with the old walking plow with which two acres was considered a good day's work. The plow is the pioneer implement of every farm and it may be cited as the only implement that is absolutely necessary to the individual farmer, in fact, it is often thought that the plow had more influence on the development of man and the direction of his lines of advancement than any other thing that he has been associated with. Very little improvement was made until the self binder was introduced, which enabled the farmer to harvest his grain quickly and thus extend his acreage. This created a demand for all modern machinery, which was followed by a remarkable change in commerce, transportation, manufacturing and the de-

velopment of the great resources of the country.

To the individual farmer the farm machine is of vital importance, being the medium through which he obtains the best results in converting the raw materials of the soil into cash. In this country new farms and other forms of business are being opened up so rapidly that the demand for laborers makes the supply of farm hands very inadequate and wages high; here also has necessity stepped in and is constantly bringing forth machinery with a view to saving manual labor and increasing the farmer's possibilities. The self-binder is a very good example. In the early part of the last century the grain was all cut, bunched and tied by hand labor, while to-day the self-binder does all this with much more rapidity and efficiency and can be operated by one man. The farmers of Western Canada are very liberal in their views and are constantly looking for something to do the work quicker and with less cost, and to do this the steam and gasoline powers are being introduced and are to-day a sign of the most modern and progressive farming. The individual makes the nation, and with the go-ahead spirit, characteristic of the Westerner, our country must rise to a position which has never been attained by any other country, because we believe this is the last, best west. To the farmer alone can be credited the progress of the country, both at the present and in the future

The farm machine is of vast importance to the nation because it is the adaptability and efficiency of the machine that determines the quality and quantity of the farm produce; it also makes the individual farmers broaden their possibilities and branch out in new lines which are made possible only by suitable farm machinery. The machine also has a great influence on the character of the individual, broadening his mind through or by its immense possibilities and complexity and the prosperity which it insures increases education and improves his social condition. The suitability and efficiency of the farm machine controls the amount of production and a nation's greatness to-day is determined by her commerce, therefore, it is essential that stress be laid upon the producing of machinery that will increase the production of farm produce with a minimum of cost.

In spite of the high degree of perfection already attained in most farm machinery, there is still a very wide scope for improvement in the machinery used for all the several branches of the farm work. It is quite improbable that farm machinery will ever reach such a high state of perfection that it cannot be improved further. One of the chief difficulties in the production of new machinery is educating the public to its proper use and value. The manure spreader is an implement almost invaluable to the farmer, yet it seemed to take a considerable time to become in general use throughout the country. Someone has to be the pioneer of every new machine and very few seem to be willing to take a new implement and find out for themselves its real value. There are some machines such as the steam or gasoline traction which because of their high price are a trifle out of the reach of the average farmer but which are used extensively on all the large farms, thus there is wide scope for the introduction of a farm motor, reasonable in price so that it may be within reach of the average farmer and yet be suitable for use in all branches of the farm work.

Perhaps the improvement possible along the line of farm motors is one of the most important issues of the day. The internal combustion motor is practically a new invention and is open for very large improvement but it bids fair to take the place of steam in nearly all cases. Also there are untold possibilities along the line of electricity. At the present time very little is known about electricity but it is quite probable it will supersede largely all other forms of power in the future.

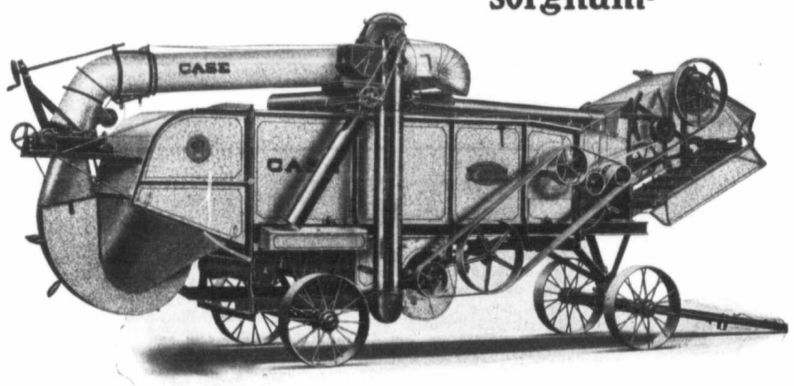
One of the most important and complicated machines found on the farm to-day is the threshing machine. It is a machine by no means perfect and is open for a great deal of improvement. As the farm machines are improved they seem to increase in complexity and consequently more competent men are required to operate them. The farming profession is one of the widest professions of the age, demanding men of sound brain and ability to put into practice the most improved methods of farming, hence the great demand for graduates of the agricultural colleges to manage the large farms.

Perhaps one of the reasons why opinions so radically differ as to the value of certain machines is because they are abused. A machine used in the wrong place is worse than no machine at all. There are many cases where farm machines have been used in utter ignorance of the real purpose and because they did not give positive satisfaction were condemned as useless. Such a machine as the roller is often abused in its use. It is an ideal machine when used on medium light soils but on heavy clay or gumbo soils proves more of a detriment than a profit to the farmer. In most cases the implements are built for a special purpose and if properly used will give every satisfaction but if used in ignorance of their real purpose will fail to do the work they were designed for and consequently be condemned.

Continued on page 30

CASE STEEL THRESHING MACHINES
THRESH MOST

The **CASE** Machines
thresh wheat, oats, barley, rye, millet, buckwheat, timothy and equipped especially thresh flax, rice, peas, beans, clover, alfalfa, sorghum-

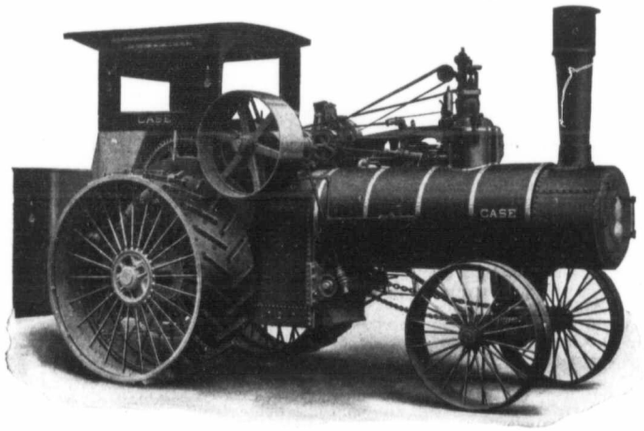


seed, red top, brome grass, and peanuts. Grain buyers pay highest prices to farmers for grains and seeds threshed by **CASE** machines.

Write for Catalog No. 68

SAVE MOST

CASE Steam Engines
stand for economy in cost of operation, strength and lasting qualities. This all adds to profits.



Immense power is produced with least consumption of fuel and water. Ideal for stationary, field or road work.

J.I.CASE THRESHING MACHINE COMPANY INCORPORATED
RACINE WIS. U.S.A.
CANADIAN BRANCHES, TORONTO, WINNIPEG, REGINA & CALGARY

Course in Gas Engineering

Conducted by D. O. BARRETT.

This is a new series of lessons that will continue for two years. These will consist of a number 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 V.

Compression—Continued

In the last lesson we took up a study of the factors affecting compression. These as given were:

Size of air pipe and connections.
Size of valves.
Timing of inlet valves.
Tension of inlet valve spring.
Poorly fitting piston and rings.
Leaky valves.
Poor lubrication.

These were discussed with the exception of the last two.

When the engine is built the valves are ground in at the factory, each valve to its own seat, and are made gas tight. The fitting of a valve to its seat must be done with extreme care as it must be tight under the pressure of compression, and the still greater pressure at the time the explosion occurs. The most prevalent type of valves for gas engines at the present time is the poppet, although rotary and sleeve valves are being exploited for the high-speed automobile engine. The latter types of valves have large rubbing surfaces and, under the high temperature of the exhaust gases, trouble is experienced with lubrication.

As a general rule the poppett valves have the 45 degree bevel seat, although good results are obtained with the flat valve. The popet valves have, of course, their disadvantages, chief among these being the noise of seating when in operation, but they will undoubtedly retain their supremacy for some time to come.

The conical valve has the advantage over the flat valve in that the force of explosion tends to force it more tightly into its seat. There is very little real wear on the admission valve of the engine when mechanically operated. Of course when automatically operated the pounding of the valve in its seat exerts a wearing action, but it is with the exhaust valve that the greatest trouble is experienced. Due to the hot gases discharged the valve and seat gradually become pitted and soon develop a leak. It is surprising how greatly a small leak in the valve will decrease the power of the engine. Of course, as soon as a leak once occurs it increases very rapidly, due to the high velocity of the gases passing through.

Exhaust valves are usually constructed of cast iron in the small and medium sized engines, while in the larger sizes both valves are of cast iron and are internally cooled by the use of water. Cooling the valve naturally keeps down the temperature and prevents to a great extent the burning of the valve and seat.

One of the chief features in the proper design of a gas or gasoline engine is to so arrange the exhaust valve and passages surrounding it, whether in pockets or in the head, so that it will be properly cooled by means of the circulating water. The advantage of the cast iron over the steel valve is that it will not pit as readily. Only the head of the valve is of cast iron, the stem being of steel, either threaded into the head or having the same shrunk on to it and the end of the stem then riveted over. The valve seat is of cast iron, either being in the cylinder head, in a pocket at the side, or in separate removable cages. One firm who places the valves in a horizontal position in the cylinder head uses a removable seat. This seat is simply a removable cast iron ring. This is an excellent feature, as, should the seat become so excessively pitted for any reason as to be useless, it would not be necessary to replace the entire head.

Of course, engines in which the valves work horizontally are more likely to give trouble than those in which they operate vertically. The reason for this is that in the horizontally operated valve the weight of the valve, acting downward, will wear the stem, or the guide in which it works. This throws the eccentric valve with its seat so that when the valve closes it will naturally strike on the bottom side first and tip slightly. Engines with this type of valve, it is admitted, operate for years without giving trouble—at least visible trouble—but the vertical valve is to be preferred, nevertheless, as it has practically no side wear either on stem or seat. It is a good plan with all valves to turn these half a revolution or so every week or oftener, this prevents any portion of the valve wearing to a corresponding part of the seat, by bringing different parts of the surfaces together.

Valves should be examined to determine any leaks which may exist. A leak past the admission valve can usually be detected by listening at the air pipe or mixer opening. This is not so easy with the exhaust valve but the condition of the valve and its seat is an index to its proper functioning.

As soon as the least sign of leakage is detected the valves should be reground. This may be done as follows:

Remove the nuts and springs from the valve stems and place the cylinder head or cage so that the stem is vertical. Mix emery and oil to a fairly thick consistency and then spread on the valve seat, dropping the valve back into position. In the head of the valve will usually be found a slot in which a screw driver may be placed for rotating. Otherwise a clamp may be fastened to the stem for this purpose. The valve should now be rotated in one direction for several revolutions, then back and forth several times, alternating the movements. This changes the position of the particles of emery, and prevents grooves being cut in the seat. It is not necessary to use pressure on the valve, its own weight being sufficient. The emery and oil will gradually work from the seat and the valve should occasionally be lifted and then dropped back again to the seat. More emery and oil should be added as needed. The grade of emery will depend upon the condition of the valve and its seat, and is left to the judgment of the operator. After using the coarser grades the job may be finished by using flour of emery. When through with the operation the valve should be removed and the head or cage washed out thoroughly with kerosene or gasoline, the utmost care being used to prevent any emery remaining and thus afterward being carried into the cylinder. The valve should then be rotated several times, using only oil on the seat. This works out any emery which may have become imbedded in the metal. Before starting in to grind the valves it is a good plan to stuff waste or rags into any passages in the head to catch the surplus emery. The valve and seat should now show bright all around denoting a perfect bearing. However, this bearing should not have grooves in it, and should there be, it denotes that the proper amount of work was not done before using the finer grades of emery. To determine the tightness of the valve it may be held to the seat with the finger and gasoline poured into the passage above the seat. Should there be no leakage the valve may be passed as being in good condition. The grinding in of a valve is an operation not to be slighted, and the operator who is thorough and consistent will be amply repaid for any extra work which he may do.

Lubrication.

A subject which ought to have the close attention and study of the operator is that of lubrication. Most operators, however, know little of the proper amount of lubricant to be applied to rubbing surfaces, and, in consequence, allow more than necessary to be used, resulting in a dirty, oily engine, and in considerable extra cost for the item mentioned.

How many times have you gone into an engine room and found the parts covered with oil and grease and then hear the owner say "Well, oil is cheaper than engines." Of course a poor excuse is better than none, but such a one is indeed poor. Oil on parts of the engine other than rubing surfaces simply signifies that it has been applied with poor judgment.

On nearly all horizontal engines the lubricator is placed near the open end of the cylinder. This supplies oil for the piston and usually for the piston pin, although in the larger sizes, an extra lubricator is often supplied for the pin. Now, ordinary lubricating oil or even the best grades of steam engine oil are not at all suitable for use in the cylinder of a gas engine on account of the intense heat generated by the combustion of the gases. This heat is sufficient to burn any of the ordinary lubricating oils almost immediately, leaving a heavy, carbon residue. This residue collects on the cylinder walls, head of piston, etc., it also gathers in the ring grooves, holding fast the rings and allowing leaks past the piston. Besides this the deposits in the cylinder are apt to become incandescent and cause pre-ignitions.

A good grade of gas engine oil should be used for the cylinder, having a burning point of about 500 degrees Fahrenheit. This oil should give good satisfaction, but should not, however, be used to excess. Too much of the oil will produce the same effects as with the ordinary oil, burning and leaving deposits.

A number of animal and vegetable oils have been found that have a sufficiently high fire test, but they contain acids which, under the intense heat generated in the cylinder of the engine, are separated from the other constituents of the oil and exert an injurious effect upon the piston and cylinder walls. For this reason the mineral oils are to be preferred as filling all requirements.

One of the best lubricants known at the present time and one which is not at all affected by this heat is graphite. Heretofore, the greatest difficulty has been in introducing graphite into the cylinder at the proper time and in the proper amount. If the ordinary graphite be mixed with oil and an attempt be made to use this mixture in the oil cup or lubricator, it is found that the graphite will settle and the flakes clog the lubricator opening. Two forms of graphite may be obtained, the flaked and the pulverized, both have their adherents, but the writer much prefers the powdered. About the only way in which it may be successfully introduced into the cylinder is through the air pipe in the dry state, or much better, mix about a tablespoonful to a pint of cylinder oil and two or three times a day allow some of

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Gas Engine Experience Department

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 experience. 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.

Uses Very Little Gasoline,

In reply to your letter I beg to say that we bought an International Harvester Co. 20-horse power Gasoline Tractor, a Mogul engine gang (five furrows), and an Aultman and Taylor Separator this spring.

We finished some threshing for ourselves and neighbors and we then put the engine to seeding. We seeded 323 acres, the work being well done. We then broke 710 acres, our greatest week's work being 100 acres and greatest day 17½ acres. We used a Ham Headlight, so that we did much during the night. We have been out threshing for 23½ days and we have about 6 more days. We have also disced 350 acres, using 3 discs and a heavy float behind the discs.

We have used $530.00 worth of gasoline up to date. We paid $150.00 for use of steel barrels. We find a great saving by using them.

This is a correct statement and telling enough to influence farmers to try gasoline power on their farms. It is certainly superior to horse power and nearly equals steam, in fact having some advantages over steam.

Our tractor uses very little gasoline, about 2.2 gallons per acre at 25½c. This certainly brings the cost of breaking low and surprisingly little when threshing.

We used two seeders joined in a rigid frame and we got over 50 acres per day seeded. When discing we use 3 with tongues of different lengths so that the discs can lap; the float being attached behind with a strong chain. I would strongly advise the use of a float in discing.

Our 14-inch five-furrow Mogul plow gave great satisfaction to ourselves and others for whom we did breaking. We were able to take five furrows.

The Aultman and Taylor 27-42 separator gave good satisfaction. Our best run per day was 1039 bushels of wheat.

We had some breaks during the season but not very serious. My sons operated the outfit themselves all through, being without previous experience; so I think no one may demur buying a gasoline engine on the score of complication.

Yours truly,
A. Glendinning,
Glenhurst, Sask.

Going Some.

In reply to your enquiry I will endeavor to let you know what I think of the gasoline tractor as a farm implement, for I would like to receive your Gas and Oil Engine Handbook, as I am always looking for pointers along that line. I am not yet an expert with my machine, having had a good engineer to run it for me most of the time.

I have a 20-horse power International Harvester gasoline tractor. I use it for breaking and discing and have broken between three and four hundred acres of land, some of it pretty rolling at that, but I find my machine is quite a hill climber.

I have a P. & O. Mogul plow with five fourteen inch plows. Owing to my land being rolling I have used only four of the plows most of the time, but on clear level land I have no difficulty in handling the five.

I also used my engine to pull trees and brush and found it worked all right. My engineer could handle the engine backwards and forwards. Three men would make the hitches and throw the trees out of the way. We pulled poplar trees eight and ten inches in diameter without using an axe or spade.

My boy, just out of High School, has just finished discing 150 acres of the land I had broken. I certainly believe the gasoline engine is the coming machine on the farm, at least on farms of any size, from a section up. I favored the gasoline machine as I consider it is cheaper than horses to do the work I was doing. I would have needed twelve horses and four men. With the engine two men handled the engine and plows and when I am through my day's work I have not got to feed it. I consider that gasoline cost me no more than horse feed for twelve horses. A horse is also liable to die at any time but you can repair an engine and make it as good as ever.

Gasoline cost me about 31 cents at the railway station, which I consider a very high price. I used from 18 to 20 gallons per ten hours steady work. It seems to me that something ought to be done in the reduction of duty on gasoline now that so much of it is being used in this Western country.

I have some photos taken of plowing and tree pulling, but they are so poor that I could not think of sending you any of them.

In closing will say that I am well pleased with my outfit and would not think of exchanging for horses.

Yours truly,
Cameron Anderson,
Edmonton, Alta.

Gas Engine Outfit the Thing.!

Regarding my experience with my gasoline engine, I must say that I am well pleased with the same. I bought my engine last

spring, 1910, from the Manitoba Windmill and Pump Company. The engine is a 6 horse power, costing me $325.00. I have used it for cutting wood and grinding.

I can cut fifteen cords of wood per day of eight hours. I like the engine very much, but I must say that the fuel prices are too high. I paid 32 cents per gallon for gasoline.

For my part, I would say that the gas engine outfit is the best thing for the thresherman, as it saves him several hired men. I will enclose a photo of my engine cutting wood. Would be very pleased to receive the Gas and Oil Engine Hand-book, as I would like to know more about the gas engine. I'm a lover of the gas engine. Yours truly,

Peter B. Hoeppner,
Waldheim, Sask.

Experience Necessary.

Our engine is an International Harvester Co. make, Type C, single cylinder, 20 horse power. The separator is a 27 inch cylinder Aultman - Taylor, complete with high weigher, feeder and blower, etc. The plows, a five bottom P. & O. Mogul gang.

The engine is simple to run and handled the separator with ease in any kind of grain we encountered this fall.

When threshing about 2 gallons of gasoline is consumed per hour. When plowing considerably more, but I am not positive about the quantity as we were very green and lost a lot of time. It depends on the operator quite a lot what gasoline the engine consumes. We pay 26½ cents per gallon for gasoline laid down here.

The trouble when breaking was to keep the engine cool, the cylinder overheating and burning the oil. Then very soon the cylinder rings get crowded and there is no power. But I think with our present experience we can considerably remedy this.

One principal thing is to have good cylinder oil, another, careful and frequent adjustment of the time plug, then good gasoline and ordinary gumption. Breaking and threshing are the only two jobs we have tackled as yet.

My own opinion of the gasoline engine as a means of farm power is that it is the only kind, and one cylinder is enough for me. The farmers we threshed for liked the rig, there being no danger of fire and a great saving of feed, board, etc. Our separator is easy to run and does a dandy job, saving every kernel.

Yours truly,
E. J. Willard,
Collingwood Farm,
Marshall, Sask.

Uses a Marine Motor.

I have read with interest the articles of your February number entitled, "The Importance of the Farm Machine upon the Farm." To my mind, Article No. 3 throws out suggestions which are important and well worthy of the consideration of any farmer, and which, within the next twenty years, will be pretty well established.

I have been working along the lines of the selection of seed under the rules of the Canadian Seed Growers' Association, and

right from the start found it practically impossible to carry on my work satisfactorily without an individual threshing outfit. During the summer of 1909 I decided I must procure this or quit working under those lines. As the work in its early stages is slow and the amount of grain comparatively small, I looked for as small an outfit possible. I found that there were several outfits made by reliable companies, but these were not as small as I wanted. They were larger than was necessary for my work and also for my pocket, taking into consideration the outlay for the amount of work I would have to do, besides being entirely green on the workings of a gas motor.

I considered it would be wiser to gain my experience of gasoline on the smallest outfit I could possibly obtain, but which at the same time would answer the purpose for which it was required. I accordingly purchased a Ferro marine motor, 5½ h.p., and a No. 2 Champion separator, 24½ inch cylinder. I had the engine fitted up with the necessary shafting, etc., and a governor and friction clutch. This was done by the A. R. Williams Company, from whom I bought the engine. We had to fit the engine up on skids when I got it home.

I do not know whether such a small affair as this comes under your category of threshing machines, but nevertheless I think the fact of a marine boat motor of this size being used for threshing grain is unique.

Unfortunately, I was late in the season in ordering the outfit, and there was considerable delay on the road before it arrived. In fact, the snow was on the ground to stay, for winter was well set in.

I was lucky enough to have the services of a good mechanic, who mounted the engine and attended to it during the time we were threshing.

I cannot say that we had good success with it that fall, or rather winter. The weather was cold and blustery and we often had great difficulty attended by long waits before the motor would start up. However, we put a tent over it, and when it did start up it worked capitally.

The little separator made an excellent job, cleaning the grain wonderfully well. I had so many little lots, tests and plots of grain to thresh, which had to be kept separate and everything cleaned up between the threshing of each lot to prevent admixture in any way. So of course it was not a fast job. But we found that we could make 20 to 35 bushels of wheat per hour, according to the straw and amount of grain in the straw. With oats and wheat we made up to 90 and 60 bushels per hour respectively. This was done with usually four of us, sometimes only three.

This fall I attended to the engine and separator, which is hand fed, myself, with two other men, occasionally four of us. Bucking the straw with a team gave the men plenty of time to look after the grain when we were threshing wheat; but with oats or barley it required four of us, and better with five. But men are not picked up so easy nowadays.

The weather was fine and warm, in fact, we picked our days, and there was no trouble with the engine at all. It was nearly always ready at once when it was required. I intend, all being well, to add a few little fixtures which I think will make it much handier, and even allow two men to thresh lots at a pinch.

I chop all my feed with an 8 inch plate grinder, and make about 20 bushels per hour; more if the grain is clean, and good and dry.

This outfit is too small and too slow for many farmers, but it answers my purpose very well. Considering the outlay on the whole outfit (freight and all expenses being $500), I do not think it can be considered anything but a cheap investment, because it does good work and gives a greenhorn a good opportunity to initiate himself in the peculiarities of gasoline, and prepare him for the handling of a larger and better outfit when he requires such. Rex.

Gas Engine Has its Place.

In reply to your letter, will say I am, as you will see, a very poor hand to tell my experiences with a pen, but will give you the plain facts.

I have a 15 h.p. International Harvester gasoline engine and a Parlin and Orendorff engine gang of four 14 inch plows. When I come to tough pulling I can take one plow off, but I have used almost all the time the four plows.

I plowed 240 acres of stubble, and used 464 gallons of gasoline, taking to do this 26 days, but I put in very short days, plowing a little better than 9 acres per day, which cost about 52½ cents per acre for gasoline and 5 cents for oil. I got my gasoline for 24 cents per gallon, but some of it was very poor stuff, so poor in fact, that I would have to use some better oil until I could get the engine warmed up. This gave a lot of bother, and I had very little trouble outside of the poor gasoline.

I have 320 acres to break in the spring, and by the time I get that done I may be able to say more about this work, but, so far, must say that I am very well satisfied with the gas tractor. For plowing gasoline is far ahead of steam, as the gas tractor does not pack the ground, and this means a good deal here. I had some 15 or 20 acres broken by steam three years ago, and today cannot get a horse gang to go in where the drive wheels went. But I don't want to leave the impression that steam is no good. It has its place and it is filling it well.

Yours truly, C. E. Anderson,
Low Farm, Man.

Fuel too High.

I have used a 22 h.p. traction and 45 brake h.p. Hart-Parr engine for one season. I think in this country, where the question of farming to preserve the moisture is so important, the gas tractor on a section of land or more certainly is a fine thing.

I have to hire all my help on the farm. I find that a good engineer, even with a boy to steer, can do the work of five men and from twenty to twenty-five horses.

I pull six Cockshutt breaker bottoms in breaking and backsetting. Then in stubble I can pull from 7 to 8 14 inch stubble bottoms. It will be seen at the present price of horses, a gas tractor and plows is the cheaper power. I have sufficient horses to do the discing, harrowing and drilling, which enables me to keep the ground worked as soon as it is turned over, which is an important item in farming.

I use gasoline only to start the engine, and as soon as the engine gets hot enough I switch off on to kerosene. A gallon of kerosene costs 10 cents less than the gasoline, and there is more power in a gallon of kerosene than in a gallon of gasoline.

I want to say right here that if the Canadian Government would take the matter in hand, they could give us a much cheaper fuel and the Western provinces would develop faster. 20 cents for kerosene and 30 cents for gasoline is more than double what it costs in the State of Kansas. I don't think I have plowed an acre for less than 80 cents for fuel.

I use from one-half to a barrel of water per day.

I consider traction plowing is much harder on my engine than threshing. I don't think I would buy a rig in this section of the country just to do domestic work at $4.00 per acre for breaking. But the way the seasons are here, with a rig we can get so much more done in a short time, and do it when it ought to be done. My experience in operating a gas tractor is that the less the operator knows about one the more bother he will have. It is very easy to have a break that will run into hundreds of dollars through not understanding the working of the engine, or through carelessness or neglect.

I have an 8 inch feed grinder which I attach to my engine, and can grind from 50 to 60 bushels per hour, which I find to be a good thing. If one has any damaged or low grade grain he can grind it up and feed it to the stock.

Yours very sincerely,
Geo. B. Snapp,
Warner, Alta.

A Good One.

The idea of your securing the experiences of those owning or using traction engines is good. I think it is an efficient way of mutual education.

I am owning a 20 h.p. International tractor, and a 5 14 bottom Cockshutt engine gang and a Rumely Ideal Junior separator.

I used the plowing outfit last summer for breaking and backsetting one quarter of a section. I did a very fine job in spite of the dry weather. Eight acres a day was an average for a run of ten hours.

As the land was somewhat hilly, I used more gasoline than I would have done on level. In the dryest days I pulled four plows at the speed of 36 to 40 minutes per round (one mile). I generally used one barrel of water for cooling; in very hot or in very windy weather, I needed more.

I can figure as follows the cost either for breaking or for backsetting:—

Machinist (includ. board)	$3.50
Depreciation of engine (supposing it lasts 10 years and working 100 days per year)	3.73
Depreciation on plows, lasting 10 years, working 50 days a year	1.79
Gasoline, 20 gal. at 26c..	5.20
Lubricating oil and grease	.50
Sharpening shares (every two days)	.08
Cost per acre = 14.80 / 8 =	$1.85 14.80

For breaking, as the land was pretty stony, I put an extra man on for attending the plows. But, as a rule, the machinist can operate both engine and plows without any loss of time.

For threshing, I could not submit you any valuable record. I got my outfit just for my own use. I started threshing when everything else was done (about the end of November). It was freezing pretty hard, and here we got some trouble before finding the trick. But very soon we found it and got along very nicely. I managed it as follows:

I took off all the oilers of the engine, except that one of the cylinder, which I wrapped with a piece of sacking, to keep in the heat of the cylinder when running and have the oil fluid all the time. I replaced the oiler of the crank pin box by a compression grease cup and those of the two main bearings by common grease cups (Hofer). Before starting I poured a pail of hot water into the cylinder jacket, through the pipe above the cylinder. The cooling water was left every night in the tank, but jacket, pipes, and pump were carefully drained before leaving, and the pipe connecting the pumps to the tank taken off. With those precautions the engine was started as easily as in summer time.

In conclusion I will tell you that I am quite satisfied with both plowing and threshing out-

fit. As to my engine, I will not say that it is the best in the world, but I can assure you that it is not a monster at all. This engine is thoroughly built, and is simple in construction, easy and effective in operation.

As to economy and efficiency, I am a firm believer in gas engine farming. I think those who are criticising the gasoline engine are doing so because they don't know it.

Yours sincerely,
Ch. J. Horne,
Zealandia, Sask.

Dry, But Did Good Work.

Two partners and myself own some eight sections about thirty miles north of Calgary, part rented out and part farmed by ourselves. In 1909 we hired some 1,500 acres broken, paying from three to five dollars per acre. Two steam outfits plowed nearly half of this. After seeing them at work we concluded that we did not want any steam engine to do any more breaking for us. As the rains as a rule come in June it seemed to me that we had to have a lighter engine than a steam engine for that part of Alberta. I believe a steam engine may be all right for half of Alberta, but not for, say, a hundred miles east of the foothills of the Rocky Mountains. One engine seemed to mire down about every other day. One day they would be pulling eight plows, when up would come a rain, and they would drop down to five. And they patched up the land so trying to avoid the wettest places.

So last June we got a Gas Traction Co.'s engine from Winnipeg, and feel confident for farm purposes it will give good satisfaction. As it was so dry this past spring and early summer, my idea is that there was not more than one-third the breaking done that would have been done had the season been normal. It was a good season for steam engines, but most of them quit by July first.

Getting the engine late and the land getting so dry, we did not make any great acreage. All the land we plowed was what the steam outfit had left the year before.

As I had no one around me who knew how to run the engine, I did not try to start it up until the expert came. It was unloaded and we hitched on four horses with the intention of pulling it away from the track a little distance, but they handled it so well that we just pulled it right out to the ranch, a mile from town.

We bought a second-hand Cockshutt ten bottom engine gang. It was larger than we wanted, but it was a good outfit, and figured to use six plows breaking and up to ten in stubble. Our engine is a 25 h.p. and weighs 7 tons. I figured our engine did the same work as 27 to 30 horses in breaking.

We plowed a good depth and made a fine job. When the work was pretty fair length and pretty straight, one man ran the engine. The self-steering device is very accurate in fairly straight work. The man who ran the engine had been working for me some months on the farm, and the first day he got so that he could turn at the ends, raise plows and drop them in again, and make an even job and not lessen the speed of the engine. Where the work is short, though, or crooked it pays to have another man. I had a good man to run it, although new at the work. He was interested and took good care of the engine. It pays to have a good man to run any kind of an engine.

It got so dry we quit breaking early in July. As we had over 40 head of work horses, the land was worked down and made ready for seeding as fast as it was plowed.

After quitting breaking we did not do a great deal with the engine except threshing.

We had thirty acres of timothy sod that the engine went out to plow with seven bottoms. The engine handled these so well that we were sorry we did not put on eight. But the other plow was not there, and it did not take one man two days to plow the thirty acres. The timothy was cut and stacked and the land drilled to wheat the same week.

We considered threshing was harder on the engine than plowing. It took more oil per day. In plowing we used from 27 to 37 gallons per day.

We have no photo of our outfit. We would have liked to send you one of the engine pulling the separator, a large cook wagon, bunkhouse, and water tank, or another time the machine and two wagons with about 230 bushels of wheat in the tanks, up a pretty stiff grade.

Like every other engine owner we have had some trouble, but feel confident that the internal combustion engine is going to cut a bigger swath every year in the farm work of the prairie provinces.

Yours truly,
George F. Stooke,
Crossfield, Alta.

Across the Border.

I take pleasure in saying that I own and operate a Universal tractor, which is made in Stillwater, Minn.

This engine develops a 45 h.p. brake test, and is guaranteed to do the work of 16 horses on the farm

I have a 6 bottom P. & O. plow, 14 inch which can be used in stony land as well as where there are no stones, as each plow is independent, and uses a wood brake pin, which I have found is very satisfactory.

The outfit can be operated very successfully by one man, but I generally have two so as to make long days, and keep the rig going all the time.

I also used 30 head of horses on the farm, but I am going to put another tractor on and sell off part of my horses, as I can do the work cheaper and better with traction power than I can with horses. My tractor uses about 1¼ gallons of gasoline and about 1-5th gallon cylinder oil per acre, and the water consumption is very little, only about half a pail a day. In fact, I can run the outfit and plow between 18 and 24 acres per day, at a cost of about 60 cents per acre, including everything except interest on my money, and I do not believe that traction plowing is any harder on the engine than threshing.

In regard to hitches for hauling drills, harrows, binders, etc., I have nothing to say, as I have had no experience as yet, but will be pleased to give you my experience next winter, as I expect I will have a lot of it.

Yours truly,
H. W. Sims,
Grand Forks, N.D.

Wants a Suitable Hitch.

My experience in gas traction farming is somewhat limited. I have operated a Flour City 30 h.p. gas tractor part of two seasons. I got it late in the spring of 1909, and not having any experience with gas tractors I had some trouble getting the right amount of power for plowing.

I think the traction engine the proper thing for plowing the tough sod of this Northwest territory, and I think the gas engine is the proper one for this territory on account of the kind and scarcity of water and the problem of fuel, also the scarcity of help of the right kind.

I have run my engine and plows alone for the lack of help. I could have done more if I had had help, but as it was I could keep going and got along fairly well. I plowed about 400 acres. I had lots of other work to do, so didn't get in the field as early as I wished. The only help I had was my boy, 11 years of age. He could guide the engine by standing on a box so that he could see over the steering wheel.

I had one team to haul fuel from town, one trip a week, and used them to haul water, of which it takes from 60 to 80 gallons per day, and two to three gallons of gasoline per acre. It depends on the condition of the soil. So that the fuel and lubrication oil costs about $1.00 per acre.

I have a 5 furrow Cockshutt plow, which I think is fine. It is hard on an engine to plow, and especially breaking, and I think it is much easier on an engine to thresh.

I would like to know how to hitch three 11 foot seeders and the drag harrow behind the plows. I have never tried seeding or harvesting with the engine yet.

Yours truly,
L. G. Wood,
Marriott, Sask.

Agricultural Engineering and the Demand for Agricultural Engineers.

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ing water? In other instances men want information on the construction of reservoirs and tanks, the installation of pumps, the erection of windmills, and the drainage of seeded lands. These calls for help come with every mail to the Department of Agriculture and the agricultural colleges and experiment stations. Our branch is doing what it can in this direction, but the appropriation is much too small to cover even a small part of the entire field. As to the agricultural colleges and experiment stations, only a few of our far western institutions maintain strong departments in irrigation. The large majority are engaged in other lines of investigation.

I offer, in conclusion, the following brief summary:

1. The great middle class of this nation—those who toil in fields and shops—intend to provide a practical and scientific education suited to the needs of their sons and daughters by the establishment of the land grant colleges.

2. At present, over 6 per cent. of the collegiate students in these colleges are being trained for the engineering profession.

3. The kind of training which these engineering students obtain tends to draw them away from the farm and shop to the city, where they become able lieutenants of corporations and municipalities.

4. For a quarter of a century or more, the land grant colleges have been catering to the demand for engineers on the part of corporations and municipalities, and have expended little effort or money in training specialists for the engineering work in agricultural communities.

5. Unless the curricula of the engineering courses of these institutions are modified, there is certain to be overcrowding in the older branches of the engineering profession.

6. Meanwhile, progress in agriculture and the improvement of rural districts are being immeasurably retarded through the lack of competent agricultural engineers.

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

The First Cost is not the Important Cost. There are Cheaper Engines than the Gas Traction Engine, But—

There is no Engine Sold That Proves as Cheap in the end as the Gas Traction Engine.

You Make a Serious Mistake If you Buy Any Tractor Without First Making Thoroughly Sure You Know Exactly What You Can Get In The Gas Traction Engine

We say that because we know—and can prove to you if you give us the chance—that the Gas Traction Engine is the unquestioned superior of any tractor on the market. It is an absolute certainty that the Gas Traction Engine is the best dollar-for-dollar investment you can make. It has the high quality, material, the expert care in machining and assembling the various parts; above all it has the dependable proved scientific construction, that make the perfect traction engine.

We know these things. We know every one of these facts are the important points for a farmer to consider.

But, Sir, you too must know them. Certainly you ought to acquaint yourself with every feature of the Gas Traction Engine—how it is built, what materials are used, what it will do—before you buy any engine.

We say it is your duty to convince yourself of the truth of our statements before you invest your money in any other engine.

Give us the chance to show you. That is what we want. Let us get together. Let us explain fully the strong exclusive features found in the Gas Traction Engine and in no other engine made. Sit down and write us a letter. If you want information on any point before you buy ask us about it. Let us help you come to a decision in the matter of buying an engine.

Just as sure as you use good hard common sense in examining this question, just so sure it is that you will send us an order for a Gas Traction Engine. Sit down and write that letter.

Take a Gas Traction Engine on Approval

Send us at once an order for a Gas Traction Engine "on approval." If it does not do the work to your entire satisfaction you don't need to keep it.

We could not afford to give you such a chance as that unless we knew for a certainty that it will more than satisfy you. Your order merely means that you will give it a fair trial on your farm—give it a chance to do everything we guarantee it to do.

Make arrangements NOW for this trial. Right now is the time for you to send in your order.

Don't hesitate to do it. We can send an engine to you upon receipt of your order. Get an engine right away for your spring work.

Never Before in Farm History

has any one class of brute or mechanical power so successfully cultivated so large an acreage at so small an expense.

It won the gold medal at the Winnipeg Agricultural Motor Contest. It has drilled, harvested, threshed—in short it has proved the greatest, most economical general farm motive power ever devised by man.

Its self-steering device is worth $1000 to any purchaser. Ensures more accurate work, saves time, saves expense, elimimates "skipping." No other engine is equipped with this wonderful device. It is truly the one-man engine.

We know from actual experience what you are up against in the way of poorly built, cheaply priced farm machinery. We have imposed upon ourselves such a standard of quality that it will never let the Gas Traction Engine meet with the same disastrous results other tractors so frequently run into.

Farmers Never Had a Better Opportunity

There has never before been a power engine offered to Western farmers that can compare with the Gas Traction Engine. That is a statement we can prove in every way.

It has broken every record for farm work.

Its motor supplies steadier power than any other engine. It has rightfully been termed by motor experts "The King of Traction Engine Motors."

We can't tell you in this space all about our engine but we do ask you to write to us if you want more information. Our new "Book of Gas Traction Engines" tells a lot. You can get it for the asking FREE. Write us and do it as soon as you finish reading this advertisement. Send us the coupon below.

Every live farmer in Western Canada ought to know what the Gas Traction Binder Hitch can do for him. The only Binder Hitch on the market to-day. Makes it possible to haul two or more binders behind your engine—the number is only limited by the power of your engine. Write to us about this Hitch.

We will make arrangements at once with live, responsible agents throughout Western Canada to have exclusive territory for the sale of Gas Traction Engines in their district. Write to us.

Gas Traction Engine Co., Ltd.
WINNIPEG, MAN.

Gas Traction Engine Company, Winnipeg. C.T.

I am interested in your proposition to send a Gas Traction Engine to any responsible farmer on approval. Please send me more particulars of this offer. Also your FREE book on Gas Traction Engines.

NAME.....

ADDRESS.....

SIZE OF FARM.....

Importance of Farm Machinery

Continued from page 19

It is important that every farm should have a shed where the farm implements may be housed. As before stated, the care of the implement determines the length of its period of usefulness and if the implements of the farm were properly housed and cared for, the outlay, which is always high for machinery would be materially lessoned and the efficiency of the implements maintained for a much greater length of time.

The century which has just passed was often called the iron age, and the century which has newly begun will probably be rightly called the steel age. Steel is taking the place of wood in numerous places and is more satisfactory, giving greater strength often with less weight The improvement which has taken place along the line of farm machinery, will go on and increase because of the great demand for the best and most efficient machinery ever yet used on the farm.

The real importance and the indispensabe position which the farm machine holds on the farm is not fully realized by the farmer personally, or by those engaged in any other line of business. Farming is a manufacturing business and like all other factories, must be made to produce the maximum of results with the minimum cost, thus demanding rapidity of work with the least possible number of hands to make it successful and mbdern machinery is accomplishing this purpose very satisfactorily. Through the influence of the agricultural societies and colleges the farmers are beginning to comprehend the important place which they play in the building up of the nation, and are being raised in their social position. The farming classes are also taking a deeper interest in the progress and welfare of their profession and country as a whole. It is a recognized fact that the farming profession is coming to be the foremost profession of this Dominion, therefore, it is essential that the farmer be educated so that he can take his place in the making and administering of the laws which govern the country.

Now is the time when a man must specialize along a certain line of business to make it a success and this is no less true of farming than any other profession. A farmer must have a thorough knowledge of the care and handling of the farm machinery, because it is a recognized fact that under the present conditions success or failure in farming operations depends largely upon the judicious use of the farm machine.

By Robt. Milne.

What can be said to be the greatest factor in the development of agriculture and attendant upon it the advancement of the farmer and the development of the nation? The answer is obvious. A more potent agency, a more universal benefactor, a greater economizer of human labor than the farm machine does not yet exist. We see railroads pushing into our country from every direction, our nation developing daily, our modern homes being built with all the improvements necessary for convenience and comfort. These improvements are consequent with the invention and improvement of farm machinery. When we stop to consider the importance of this class of machinery we are at once convinced that it is the most important branch yet invented, yet as we look at the machines in operation, under the care of incompetent men, or idle in the fence corners or under a snowdrift, we are again confirmed in the opinion that no other class of machinery gets such little care and is so much exposed to weather and abuse.

In many cases machinery enables the farmer to produce a better crop or a finer market product at a decrease in the cost of production. The farmer of a century ago without agricultural machinery was a peasant who toiled with his hands to produce a scanty living for his family. The farmer of to-day is a machine operator who rides on a comfortable spring seat and uses labor-saving machinery to produce commercial crops. American inventions have made agriculture a commercial business in which a man without help can support a family comfortably and even amass wealth. American farmers enjoy a greater average of comfort and wealth than any other class of people of equal number in the world.

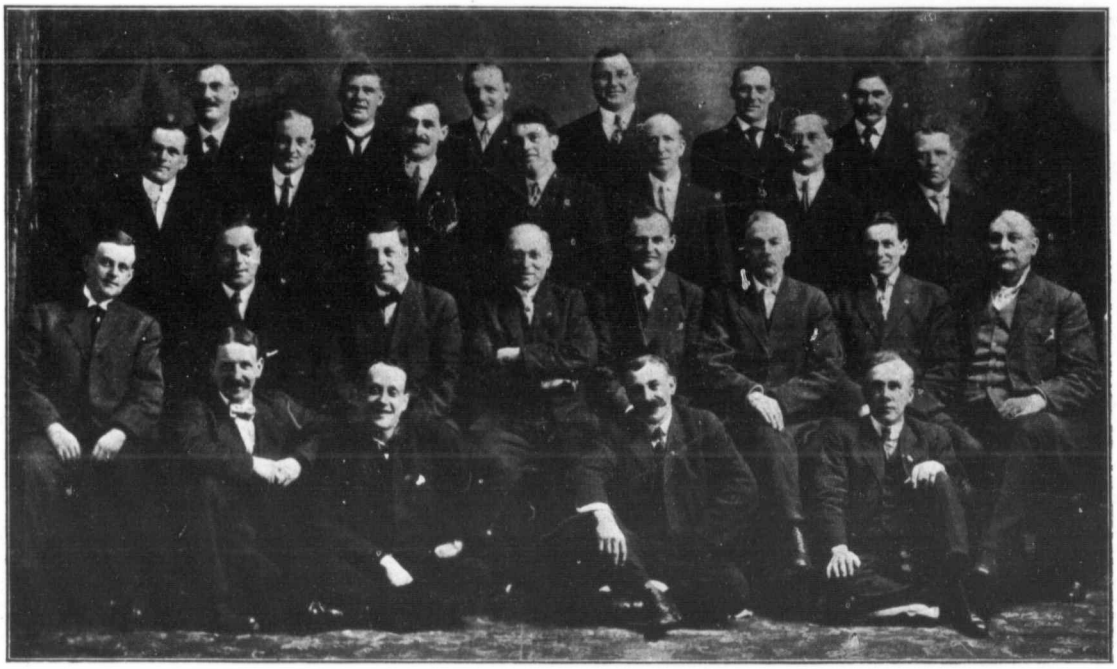
Machinery is a blessing to most farmers and to others it is a curse. Some buy too much and a few buy too little. With few exceptions, farm machinery is idle from ten to eleven months in the year and in a condition peculiar to itself alone, therefore, we must not keep an over supply of machinery because the profits have to be extremely large for the short time it is in operation in order to pay interest on the investment. When should we buy a machine? From an economic standpoint let us consider the advisability of the buying of a threshing outfit by a farmer with an average crop of ten thousand bushels. Let us suppose the outfit cost complete twenty-five hundred dollars and it would take him ten days to thresh his crop and that the life of the machine be ten years.

Loss by depreciation per year	$250
Interest on Investment	150
Ten days' help at $35 per day	350
Oil and incidentals	25
Cost of threshing 10,000 bus.	$775

The average price for a professional thresher being 7c. per bushel or $700 for entire crop. Thus we see a loss of seventy-five dollars. Figures only help to decide and the questions arise can he hire a machine to do his work? Will his own work be of such a superior quality; will he have solved the labor problem to such an extent that it will warrant him purchasing an outfit at a loss of seventy-five dollars cash each year? Is he a good enough machinist to operate the outfit himself or can he hire competent men? Good judgment and common sense must be applied to solve these problems and no attention must be paid to the blathering machine agent, as every person knows or should know his own business best. Buy nothing but good machines from good reliable firms, as cheap machinery is generally a catch trap and the farmer often pays dear in the end. After purchasing the best give it the best possible care. No merchant or manufacturer would expect to make a profit unless he exercised the strictest economy and took the best possible care of his equipment. Yet many farmers will buy machinery costing from one hundred to two thousand dollars and give it no care whatever. A season without shelter detracts more from the value of farm machinery than the wear caused by its use during the same season. It is a well-known fact that iron and steel exposed to rain undergoes a chemical change; rust is formed, which causes gradual destruction of these metals and interferes greatly with the efficient working of the machine, thereby causing the loss of much valuable time and also producing a class of work much below the standard. A machine is no stronger than its weakest part, therefore the greater necessity of so caring for it that none of its parts become weakened by unnecessary exposure is evident.

Every farmer should be a farm machinist. He must not forget his machinery and direct all his study and energy toward production or co-operation. The sooner the farmer starts to study the principles of farm machinery along with his other duties, the sooner will he be on the road to successful farming. There is not a day passes but what he is using some kind of machinery. Let him start this study and follow his studies up with practical work. A

Continued on page 80



THE SAWYER-MASSEY TRAVELLING STAFF

Row—W. A. Fleming, Yorkton; Mac McLean (formerly of Oak Lake, Man.) moving to Saskatoon; E. J. McKee, Brandon, Man.; W. J. Galbraith ("Big Bill"), Oak River, Man.; Joseph Clark, Dauphin, Man.; J. W. Maib, Lethbridge, Alta.

Second Row—Henry Bird, Radisson, Sask.; D. Lamont, Wadena, Sask.; C. R. Laird, Regina, Sask.; F. J. Swanson, Red Deer, Alta.; Wm. Collins, Deloraine, Man.; E. J. Ramsay, Wetaskiwin, Alta.; W. J. Moran, Edmonton, Alta.

Third Row—A. D. Beaman, Saskatoon, Sask.; Thos. P. Bell, Wolseley, Sask.; F. C. Moore, Weyburn, Sask.; John McVicar, Winnipeg, Man.; C. W. James, Abernethy, Sask.; H. Ross, Saskatoon, Sask.; R. N. Allen, Carman, Man.; A. E. Story, Saskatoon, Sask.

Fourth Row—J. E. McKenzie, Saskatoon, Sask.; W. A. Udell, Moose Jaw, Sask.; G. P. Shrubsole, Calgary, Alta.; J. H. Humphries, Swift Current, Sask.

Sawyer - Massey Company's Travelling Staff in the West numbers twenty-five men. There is a group picture of them on this page.

During the past week they have gathered at the Company's Office and Warehouse in Winnipeg for the purpose of receiving information and exchanging ideas regarding the full line of Sawyer-Massey Machinery.

No efforts were spared to make the meetings instructive and helpful. Not only did the Company do its part very effectively, but the Travellers aided materially in the work by attending promptly and regularly; in fact, a full attendance was recorded at every meeting.

Starting with the Sawyer-Massey Grader and continuing with the "Eclipse," "Daisy," and "Great-West" Separators and the various attachments for each, the first day and a half was certainly well spent.

The "Ohio" Tractor was then taken up; this was thoroughly demonstrated in a practical and successful manner, and proved to be a surprise to everyone present. We are quite within the mark when we say that there has never been such a remarkable and satisfactory demonstration of any Tractor in the West. A full and free discussion regarding Opposition Gas and Oil Tractors rounded out Thursday into a well-filled day. In fact, the men were so interested in the discussion, that they asked for an evening session, which was completely taken up in making comparisons with opposition goods.

KEEN FOR BUSINESS

On Friday two very instructive and helpful meetings were held at the office in the Union Bank Building. At these meetings the detailed work of a General Agent or Traveller was thoroughly taken up and explicit instructions given regarding contracting with local agents, taking of orders, delivery of machines, securing of settlements, and the relation between this work and the office.

Friday evening the scene of operation shifted to Deer Lodge, where our ever genial "Chad." had prepared a feast which invited the combined efforts of the Sawyer-Massey field, office and warehouse staffs of the West. Here is a copy of the menu, which speaks for itself.

MENU

It's a "Hummer."

Prepare yourself with "S.-M." Teeth and slacken your belts

Olives Celery Cucumbers

Use your Hand Feeding Attachment

Oysters

Blue Points on the Half Shell

Separated by an "I.X.L." Picker

Soup

"Gasoline," a la "Ohio" or "British Colonial"

Fowl

Fried Spring Chicken

It's a "Daisy" and cannot be "Eclipse (d)"

Never raised on a farm where a "S.-M." Separator threshed

Vegetables

French Fried Potatoes

Parsnips Corn

Products of the "Great West"

Sweets

Apple Pie Mince Pie

Pumpkin Pie

Cheese

Extras must be written in the order

Ice cream

Made in a Telescopic Mould

Assorted Cakes

Tampers and Wedges

Coffee Tea

Cigars (Headlights)

Easy Steaming qualities, a la "S.-M." Engines

We've proved to be good Feeders—But we can't beat the "Woods"

After justice had been done to the good things provided, it was unanimously agreed that the Company assembled had upheld the merits of the goods they are handling by doing a good clean job, without waste or throwing over.

Because of recent bereavements which had befallen the Manager, Mr. George Kirkland, he was unable to be present, and the duties of Chairman devolved upon the Assistant Manager, Mr. J. H. Turnbull who in a few well-chosen words voiced the regrets of all present because of the enforced absence of Mr. Kirkland and the inability of the President, Mr. Harmer, to be present.

The social part of the evening proved to be a great success. It was something like this:

Toast, "The King," accompanied by the Veterans' song by Mr. J. J. Polson, the entire assembly joining in the chorus. This proved to be an innovation and a very successful one.

Toast, "Our President," ably responded to by Mr. Theo. A. Hunt, City Solicitor for Winnipeg. Following this a personal message from the President was read by the Chairman. That this message was distinctly personal, and seemed to contain something for each man present, was evident by the marked attention and hearty reception accorded it.

Mr. Banyon then amused and mystified the audience with his sleight of hand performances. Many of the travellers followed this performance closely. We wonder why!

Toast, "Our Manager," replied to by Mr. A. L. McLean, of the office staff, and Mr. E. J. Ramsay, of the field staff.

Mr. Burch, comedy singer, entertained the audience with a couple of selections. His efforts were greatly appreciated.

Toast, "Our Travellers," responded to by John McVicar, the oldest traveller of the company, and Mr. E. J. McKee, the most versatile member of the field staff. The remarks of this gentleman were greatly enjoyed, especially the epigrams or mottos, with which he concluded his address. He likened the "Ohio" Tractor to a human being, and suggested that his fellow travellers take a few lessons to heart. Some of which were as follows:

1. Keep lots of tension on your intake valve.

2. Be careful of the mixture you put in your carburetter.

3. Keep your exhaust valve open.

4. Don't spark at the wrong time.

5. Use water in your cooling tank before going to bed and you won't get up with a cross head in the morning.

Mr. T. W. McKee, of the office staff, then rendered two songs in a very finished manner, for which he was loudly applauded.

Bonus cheques were presented to the three travellers who had made the highest sales in certain lines of goods. The men who earned these cheques were: C. W. James, of Abernethy; Henry R. Bird, of Radisson; E. J. Ramsay, of Wetaskiwin.

Mr. W. J. Galbraith, the biggest member of the field staff, and commonly known as "Big Bill," then favored the audience with a violin solo. He was accompanied on the piano by Mr. E. J. McKee, and his efforts were so well appreciated that he was obliged to play the second time.

Mr. Banyon gave a second performance, which was fully enjoyed.

Toast, "Our Warehouse Staff," responded to in a very neat and effective manner by Mr. William White.

Mr. Burch again favored the audience with a couple of vocal selections, which were certainly well rendered and fully appreciated.

Toast, "Our Local Agents," replied to by Mr. Mac McLean, of Oak Lake, who graduated from the Local Agents Organization some years ago to become a member of the field staff. His remarks were exceedingly well chosen and appealed to all present.

Mr. J. J. Polson then sang a couple of songs in a very creditable manner, for which he received due applause.

One of the younger members of the office staff, Mr. Ewart Henders, then amused the audience with a few original "take-offs" on the travellers.

Toast, "The Office Staff." Mr. A. B. Wright and Mr. W. F. Fuller responded to this. Mr. Wright covered the ground very fully and did not forget to make mention of the lady members of the staff, to whom a toast was drunk in a very hearty manner. Mr. Fuller, an old member of the staff in the East, but a comparatively new member of the Western staff, spoke very nicely and made reference to the work of the Chairman in connection with the meeting and the Banquet.

Following this, Mr. McBride proposed the Toast, "Our Chairman," which was completed by the company singing "For He's a Jolly Good Fellow." The Chairman replied by thanking the audience for their kindness.

Mr. W. J. Galbraith, "Big Bill," was then called upon for a song, and his singing was of such a satisfying character that he was only allowed to stop when he had finished the third song.

Mr. Geo. A. Shields then contributed a few remarks which kept the audience convulsed with laughter during the time he was on his feet.

A most enjoyable and successful evening was brought to a close by the Chairman leaving with the different employees of the combined staffs a parting message for 1911. Following the singing of "God Save the King" and "Auld Lang Syne" and the hearty rendering of three cheers and a tiger for the Host, the gathering dispersed at mid night.

On Saturday morning the entire field staff assembled at the warehouse at 9 o'clock to receive information and discuss the steam engines, and again in the afternoon another meeting was called for the purpose of discussing opposition engines.

During the course of the afternoon, the "British Colonial" or Marshall engine, as some know it, was demonstrated very successfully by an English expert, and then the field staff was divided into squads to receive detailed instructions regarding the starting and operation of this tractor.

The week's work was brought to a close about 5 o'clock on Saturday afternoon when the warehouse foreman, Mr. William White, on behalf of the company, made a very neat speech, in which he thanked each and every member of the field staff for the prompt attendance, interest shown and help rendered in making the meeting so thoroughly successful, as by the many talks and short lectures which the old and also the new members of the field staff had given, the staff had been greatly benefited.

Mr. White then called upon Mr. E. J. McKee for a few remarks and he responded by asking Mr. J. H. Turnbull to step to the front, and did not forget to mention that this was the first time he had ever had an opportunity of giving the Assistant Manager his orders. Mr. McKee then proceeded to read an address which was signed by each of the twenty-five members of the field staff, which set forth in a very hearty and cordial manner their appreciation of the Assistant Manager's efforts up to the present time in guiding their work, in encouraging the different members of the staff, and doing all in his power to make the relations between the individual members of the field staff and the Company more friendly and as satisfactory as possible. As a token of their appreciation and esteem Mr. Turnbull was then asked to accept a handsome leather-covered Den chair. Although totally surprised and considerably overcome by this expression of appreciation and good fellowship, Mr. Turnbull thanked the travellers for their kindness and left with them a few words of encouragement, closing with the assurance that they would continue to receive hearty and loyal support from the Company.

The Men Who Make No. 1 Hard

The Experts Catch It.

Being a young man I don't suppose I will be able to write such a lengthy threshing article as some of my older brother threshermen; as I haven't had the years of experience that some of the old timers have had.

I think this is a good idea of yours to publish experiences, and I believe the different sketches should prove interesting reading, especially to those who own a threshing outfit.

By way of a start, I will tell the readers of the "Farmer" some of the times I have put in following a rig in the State of North Dakota, as a great many of us know that is the place where they really and truly go in for big work.

Going to that state in the fall of 1900, I got a job as pitcher on a Battle Creek Advance rig. It was a hand feed and straw carrier outfit, and most all of the threshing was done out of the stook.

Our gang consisted of from 8 to 10 teams hauling bundles, and four men as field pitchers, while at the machine were two feeders and two band cutters. This made up the crew as far as the separator was concerned, as the farmer was supposed to haul away the grain as it was threshing.

Threshing in North Dakota isn't too bad, excepting for the long hours. I have seen us out in the field before daylight looking for stooks, and that in the early fall when the day broke before five o'clock. Then it was always dusk when we quit, and sometimes, if there was any chance of finishing a field, it would be nine and half past before we would get our supper. One redeeming feature was, however, that we always got first class board, as the boss carried his cook car right along with the outfit. The long hours used to go pretty tough with some of the eastern harvesters, and one lad I heard about wrote down to his folks in the East, and said that North Dakota in threshing time was like heaven, as there was no night there. However, they paid big wages, and if you didn't like the hours you could go somewhere else and some other person would take your place.

Well, I stuck to the Advance until she pulled in, and when I figured up my time, I found I had put in something over 20 days, mostly all stook work, only a few days at stacks in the last of the run.

The following fall I was still in the State, and went threshing again with the same boss, but this time a new rig, up-to-date in every particular. It consisted of a 25 h.p. Buffalo-Pitts engine, and 40-60 Aultman & Taylor separator, and the way that machine used to take the bundles was surprising.

This time we had from 10 to 12 stook teams and spike pitchers at the machine. Let me say here that spike pitching is about the toughest proposition in the line of hard work a man wants to run up against. It is not only the pitching, but the climbing in and out of racks, and then you never get a breathing spell at all, for as soon as the machine stops to move you have to attend to the belt and help get things in shape to move. Spike pitchers were always paid a little more than the other pitchers, and they earned it.

I drove a team and wagon of my own this fall, and got $4.00 a day for the first half and $4.25 for the remainder of the season. We had a first class boss, and any wet days that came you got your board, and wasn't charged up for it when settling time came.

In the same neighborhood as we were was another large outfit threshing, operated by a man named Sellers, and he used to go in for longer hours than we did. In fact, they used to say that he threshed as much by moonlight as he did by sunlight, and some of the boys of our gang used to have a saying when they saw the moon rise, "There comes Seller's sun."

By way of finishing my Dakota experience. As regards the amount of grain threshed a day, we used to thresh from 3,500 to 4,000 bushels, mostly wheat, and one day we made 4,400, and a great big percentage of that, wheat. I got in about 19 days with my team and then as it came on very wet, the boss pulled in and paid off the crew. That same fall, or early winter, I sold out my claim which I had and came back to Canada, and purchased a farm east of Crystal City, which I still own.

For a few years after leaving Dakota I didn't do much at threshing, and as I didn't have very many acres in crop I used to hire it done. But as I got more broke and bigger crops, I found hiring threshing done was pretty expensive and so decided to go in for an outfit ourselves. I say ourselves, for my three brothers all had farms adjoining; so we concluded to thresh together.

In the summer of 1905 we purchased a second-hand J. I. Case portable outfit, a 20 h.p. compound engine, and a 32-54 wood separator with feeder and blower. We hauled it home in June and never looked at it until the day we started up to thresh, and then our troubles began in earnest.

Every thresher knows that when a separator is pulled in in the fall, if it is an old one it is generally in bad shape, as lots of things that ought to be fixed good are just patched over to finish,

and that was the way with our rig. Of course, we were green, as we never operated a rig of our own before, and had lots to learn.

Well, we pounded away all fall, and towards the end of the season we broke down our separator completely, and had to borrow another to finish our own jobs. Our engine ran fairly well after we got a man that understood his business.

Well, the next fall, profiting by our former experience, we went about things in a different way, and before we started out we gave our separator a thorough overhauling, put in new straw racks, and fixed things up in general. We had better luck this time and succeeded in finishing all our own crop.

Just a word here about some of the so-called experts. We had a lot of trouble with our machine clogging up behind the grain deck on top of the chaffer. An expert came along one day and we showed him our trouble, and he said that the vibrating arms or pitmans that work the decks were worn short and didn't give the decks shake enough. A couple of days after we found out that the hanger rod over the chaffer was in upside down, and he said he couldn't see it. When we took this out and replaced it, it went off like a new machine.

We ran this rig until last fall, and then we got a new steel Case 32-54 separator, and to say it is a pleasure to run it is to put it mildly. We hauled it home from Crystal City about two weeks before we started to thresh, and before pulling out gave it a thorough going over, and let me say here, that there is scarcely a machine on the market today that a man who has been used to working around can't improve. I took off all nuts that I thought might work loose, and put soft leather washers under them, and it paid me 100 per cent. to do it, as I didn't have a moment's delay all fall in losing bolts or looking for lost nuts.

We started up to thresh on August 26th, and for the first half day didn't do much but get things suppled up. Our feeder bothered us a little on the start on account of some of the boxings being too tight and full of paint, but after we got this remedied things went off first rate.

On the following day we started to work in earnest, and our crew consisted of eight bundle teams with low trucks, and each man pitched his own load and then threw it off at the machine. I, as separator man, generally kept the stuff that would fall off the racks under the feeder scraped up, and then we didn't lose so much time when we wanted to move.

Threshing in our locality this fall was kind of trying work, as the stuff was so thin and moves so long that you could scarcely get a good day's run without moving a great distance. However, on the whole, we did fairly well, and when I balanced up my books in the end I found we had made about $500 clear, and had our own four jobs to the good. That wasn't too bad for a small rig, considering the bad year.

Let me say here, that for three or four farmers, situated as we are, if they can agree, that a threshing machine is a money saver. For my part I wouldn't think of trying to farm if I didn't own a share in an outfit. I figure that our threshing doesn't cost us over two cents per bushel. Of course, we cut out all the big expense, such as engineer and separator man, my brother running our engine. And we never hire a team if we can help it, as we have lots of horses, and they might as well be on the job as running in the pasture at home. Then most of our crew consisted of our neighbors that we threshed for, and they were as anxious to see things go along as we were. So we had no kicking about hard work or long hours.

As regards the price paid for threshing. We charged 6 cents for oats and barley and 8 cents for wheat, and we furnished everything; all but to haul the grain away. We paid the farmers that helped us so much per day, and then gave them credit for that amount off the threshing bill. We found this a most satisfactory way.

Let me conclude with a bit of advice that I heard an old thresher give, and it is worth remembering. "Be perfectly sure everything is all right, then go ahead and thresh." Of course, accidents will happen sometimes, but if one sees that things are adjusted right, and no loose parts, one will have very little trouble. I never lost more than an hour in a run of 30 days this fall with my new separator.

Wishing the Canadian Thresherman and Farmer success, I remain,

Yours faithfully,
T. C. Sands,
Crystal City, Man.

At it Since He was 12 Years Old.

I started to fire on a threshing outfit when I was twelve years old; that was seventeen years ago, and I have been with an outfit every fall since. So I know a little about the pleasures and hardships of a thresher's life, and I have come to the conclusion that a man dearly earns all he makes with a threshing machine.

I fired on different makes and sizes for eight falls before I had the courage to try to run one. Then I started out as an engineer and ran engines for other threshermen for six falls, and in the spring of 1908 I bought an outfit of my own at an auction sale, consisting of a Sawyer and Massey engine, 25 h.p., and a 36-60 Northwest separator. The engine had run six falls and the separator about 40 days, or a season and a half, for thirty days is considered a good season's threshing around here. There are so many machines in this locality that unless there is an extra heavy crop threshing doesn't last long.

The engine was in pretty fair shape, but doesn't give me quite as much power as I would like. Otherwise, it has given me no trouble whatever.

The boxes of the separator and also belts, were in pretty good shape when I got it, but the whole inside was shook to pieces. I had hard work to get any jobs around home the first year because the machine had such a bad reputation, for the man that had

owned it was foolish. But I took no notice. I had been with the Northwest machine for two falls, and I thought it was the machine for me, and I did not see why I could not make this one run. As soon as I got it home, I built a good dry shed over it, and started and worked at it every spare minute I had all summer; even on rainy days I used to work on it all day. I have a blacksmith outfit of my own, which helped me greatly to fix things up. It was the first work I had ever done on a separator, for I had always been used to the engine, but I must have put it in pretty good shape, for I hired a good separator man to run it. Before we started out, I told him he had better come and have a look at it to see if there was anything more to do. He examined it all over and pronounced it sound, but advised me to put bolts in the slats on the feeder canvas, which I did and found to be a good thing. They were only put on with clout nails and were liable to come off at any time. But after putting the bolts in every slat stayed on till the canvas was worn out.

Well, we started out and ran 32 days, without a 20 minute stop with the exception of one half day. We ran out a cylinder box, but that was not the fault of the machine. The separator man neglected to watch it. I think that was pretty steady running. We put through 1,048 bushels of wheat one afternoon, and moved three times, but, as a rule, I never try to crowd my machine; just try to keep steady running all day. I think it pays best in the end.

I think two good men can give a 36-60 separator all it can handle. People were surprised to see my machine run so steady, but it was just as I thought; that if a machine is put in good shape to start with, and handled right, it is bound to run steady. And that is what counts, for a man to make money nowadays, with wages so high and the seasons so short, don't want his machine to be stopped half the time.

It was a pretty hard proposition to make any money around here last fall. The crops were so light, we had to move so often, and water was so scarce. I had to put on three tanks, for we had to draw water nine miles sometimes.

The usual price for threshing in this neighborhood is 6 and 7 cents, but some raised it a cent last fall on account of the water.

Last fall I ran my own separator. It seems hard to get anybody that is any good with a separator, but there are lots of engineers; so I hired an engineer and took the separator myself, and got along fine. I don't like it, though; there is too much dirt and worry about it. I think I will go back to the engine again this fall.

Last fall, as soon as the machine was stopped for noon, I used to crawl inside and examine all the decks. Then I would have a look at all the belts to see that they were not coming unlaced. When I had done that I would take the oil can and start at the point of the feeder, and oil down one side and up the other. In that way I would not miss any oil holes.

I always carry a heavy canvas about 12 or 15 feet square, which I spread under the feeder as soon as the machine is set. I think it saves a lot of time in cleaning up.

Last year I tried the sight feed glass oilers on the cylinder boxes instead of the grease cups, and they worked to perfection. I always try to keep the loose stuff cleaned up from in front of the machine, so that in case of fire I could pull her out easily. I have seen some threshers allow it to pile up until you could hardly see the feeder at all, and if a fire started around the separator it would be almost impossible to save it. I have heard of several machines burnt that way, and I believe another good idea is to carry a broom and sweep the top of the separator about every hour, also sweeping it thoroughly all over the last thing at night in case any sparks light on it in pulling out at night. In the three years that I have run my machine I have never had a fire around my separator.

Well, I think I have written about enough. When I get talking about threshing machines I don't know when to stop. I have been farming all my life, and if I saw my neighbor's horses go by my door I would not know them, but I can tell you the make and size of every threshing outfit within 15 miles of me. That is my one hobby. I never get tired of talking threshing machines if I can get anybody to talk to me, but I am sure you will be getting tired, so I will cut it out.

Wishing your paper every success, I remain,

Yours respectfully,
Wm. H. Madole,
Napinka, Man.

Some Good Advice.

I am not a subscriber to your valuable paper, but in looking over a copy of your February, 1911, number I was not only interested in the experience letters, but enjoyed your paper as a whole from front to cover.

My experience during the fall of 1910 is as follows:

I operate a Sawyer-Massey Great West separator, large size, with Ruth feeder and Perfection measure, and my power is a 32 h.p. J. I. Case engine, 1910 model.

Both the separator and engine give perfect satisfaction. I have more than enough power, and the separator is speedy to handle grain, and saves 99 per cent. of the average crops, and is a good cleaner.

I run the engine myself. The fall was good, as far as weather was concerned, but water was scarce, and not good for boiler use. When low, I find it has more impurities, causing foaming to a considerable extent, especially in plowing, which I do a lot of.

The gang consisted of ten to twelve stook teams, one field pitcher for each two teams, two spike pitchers. It pays to get the best men you can hire, even if you have to pay an extra dollar per day. I find the cheapest spikers are the men who take an interest in your machine. Keeping feeder full and even is what counts.

The crops averaged, stubble wheat per acre 15 to 25 bushels, summer fallow wheat per acre, 20 to 30 bushels, flax 10 to 18 bushels, barley 25, oats 45. Our average in wheat was 2,400 bushels per day. In 32 days' run we threshed 82,065 bushels. The prices were, wheat 8c., flax 16c., oats, barley 6c. per bushel.

I had a good separator man, the one most necessary man for successful threshing. I paid him $7 per day, and he kept belts and all adjustments proper, and what many do not do around dusty, chaffy boxes, he put the oil to the bearings, not on the box lid, which causes many a hot box.

I find many machines are ruined by this one cause, and the machinery and manufacturers blamed, just through careless oiling, and improperly adjusted boxes, causing heating.

In the fall's threshing it is easy to pick out the farmers who cultivate their soil properly. I find a difference of 8 to 12 bushels per acre on adjoining lands owing to the difference in cultivation.

My engine is a dandy at plowing. I have no bother whatever burning straw as a fuel, as the proper draft is used, and a little judgment in feeding straw in the chute keeping tubes and sheet clean. The following are some of the main points I have learned from seven years' experience plowing and threshing.

First, get the best men, and also experienced. They are the cheapest and will help your machinery last.

Second, a jerky reverse is generally caused by an improperly lubricated valve. To prevent pounding, use the best grade valve oil and enough of it. That's the only way and it saves temper, fuel and water. Be sure it is set properly.

Third, keep your door (fire door) open as short a time as possible. You can't blame boiler makers for leaky flues if you let cold air rush in on them every few minutes.

Fourth, in using coal as fuel plowing, keep ash pan clean; have a clean and not too heavy fire if you want steam. Don't want to buy new grates every month, and perhaps some grates are no good.

Fifth, use lots of dope on gears.

I have run gas engines and think they have the advantage over steam; economy in water, help and fuel.

Wishing you success, I remain,

J. I. Philips,
Osage, Sask.

Averaged 1963 Bushels per Day.

I will endeavor to give you a short story of our outfit, which has been run eleven years. Our outfit consists of a Reeves 25 h.p. Cross Compound engine, and a 40-63 separator of the same make. It is always kept in a shed when not in use threshing.

This outfit is too large unless you have a long run of custom work, and then it is very hard to get men and teams to run an outfit like this to its full capacity.

However, it was profitable to us, as we had a long run and seven teams of our own to put on, and we ran everything on a business method. We charged one price to all, 7 and 9 cents a bushel, and had a certain time to start in the morning and a time to finish. Every man had his job and had to look after it to the last letter. In this way everything went like clockwork, and all were interested in the work.

Our only trouble to any extent was the way our first deck was was built. The grain and straw was all thrown together after passing the cylinder, and no way for it to separate until it dropped back off this deck or grain pan, and, of course, you had to thresh slow to get all the grain out of the straw. But I notice this company and many others have remedied this in their machines.

One of the most important things we notice is to have the outfit in the very best of condition before you start out, and the owner, if he expects to have everything going right, must understand both ends of his machine and see to it all the time.

We had a cook car with the outfit and charged one cent a bushel extra for it, but found that it did not pay on account of so much wet weather. It takes one cent a bushel to pay for everything connected with a cook car if you are threshing all the time; that is, to feed the men well, and that is the only way.

We sold our outfit two years ago. But we are in the business one way or another ever since.

Our average the first two falls I was in with this firm was 1,693 bushels a day. We used coal in the engine and had some great experiences until we found out the best coal for steam, which we considered was the Youckengia. The engineer did his own firing, and we ran on 1,800 pounds a day. I remain,

R. C. Barber,
Snowflake, Man.

An Old Timer.

My experience in the threshing field dates back to the year 1894, when my father, who lost his crop through negligence of the thresher he had employed, decided to have a machine of his own.

Of course, I must lay the scene in Washington, U.S.A., in Palouse County, and at that time I was quite a boy, only 14 years of age.

Dad, as we called him, was pretty hard up, and had not got over the panic of 1893. So he had to go slow in the selection of

a machine, and, by the way, he picked up an old Buffalo-Pitts machine that had been run a couple of seasons and had been mistreated. It had stood out in the weather and had been robbed of all the carriers, etc., so it was merely a shell. The price paid was $55.00.

However, not in the least daunted, we got it home and rebuilt it in our shop from one end to the other. The power was furnished by 12 horses, and the straw was stacked by hard labor in those days. We fed by hand, and the feeder was the big man of the crew.

We cut our grain with a header, and hauled it directly to the machine, and it was run through and sacked. 700 to 1,000 bushels was a good day's work. We ran that machine three years and sold it, buying a small steam outfit, consisting of a 10 h.p. traction engine and a 28 x 48 Buffalo-Pitts separator, which gave good satisfaction. This machine was operated a couple of seasons when Dad thought he must have a wind stacker, and we got into communication with the Russell Wind Stacker Co., of Indianapolis, Ind.

The company shipped us the blower, and we attached it ourselves and had very good success.

The wind stacker was found to be one of the greatest labor savers as yet that we had tried, and our success in this venture spurred us to buy a self feeder. This machine, equipped with blower and self feeder made a very nice outfit, but we found our power too light. Hence we purchased a new engine in the year 1900. This time it was a 16 h.p. Pitts traction and a straw burner.

My brother was now acting as engineer and I was separator tender, my brother being 18 years of age and myself 20. As I look back and think of the confidence I had in myself at that age, it would seem that I hadn't learned a great deal since. Nevertheless, we went out to thresh. Started in until noon, about 2½ hours' run, when we ran out of water. We went to dinner, and in some manner fire got started, and got into the grain stacks, and in less than half an hour we had no machine and only part of an engine, the jacket being burned off, and some of the smaller bearings being melted. This, of course, naturally stopped operations for a time, but we managed to secure another machine, a J. I. Case, to go ahead with. We ran this outfit until the year 1901, when I and my brothers determined to go into the business for ourselves.

In 1901 we turned our harvest earnings, some $350, into a 10 h.p. Advance traction engine, which had been in a fire and had all the nttings burned off and the bearings melted out. We rebuilt this machine and sold it, clearing a couple of hundred. With this meagre capital we determined to buy a large threshing outfit, and after looking over several outfits, bought another Buffalo-Pits. I have often wondered at the Machine Company's taking the chances they did in letting us have the layout. As for property, I had one small horse and my brother had nothing.

We used our $600 in buying a few old wagons and fitting up. However, now we must go about 30 miles away from home to thresh, and our luck being poor, striking a bad lot of grain, being wet, we certainly had a picnic proper. Our engine was supposed to be a straw burner, but it never did steam well, so we had trouble in keeping up steam, and about the time we would get going we would get a bunch of that wet grain into the machine, when "B-r-r-r," and everything would stop. Then would come the job of digging out, and of all the heart breaking jobs that is one of them.

I can tell you this much; there were some pretty sick boys, but having a horror of being called a failure urged us on. We ran that machine for three seasons, and on the very first of the fourth season were threshing some very smutty grain. This machine exploded and caught fire. I was standing on top of the machine and was blown several feet in the air and came down in the machine. Smut, if properly mixed with air, ignites as easily as vapor from gasoline. The separator was on fire in just one puff from stem to stern, and in less than 30 minutes was totally burned to the ground.

I had the misfortune to be severely burned in this blaze, and for two weeks could do nothing. But my brother was hustling about in the meantime and procured another separator, which we drove with our old engine. This machine was what is called the Pride of Washington, and is built in Walla Walla, Washington, and had a reputation of being a good machine, but we certainly had a round of pleasure in breakdowns, one or more occurring every day for a week. Nevertheless, we finally got going and did a fair season's work. The blower, giving us a good deal of trouble, we decided to build it over and make a gearless out of it. We made the mistake of putting the fan shaft entirely through the housing and it failed.

In 1906, being dissatisfied with our engine we managed to trade for an Advance 22 h.p. heavy geared engine, and then we bought a new blower for our separator, a Maplebay, manufactured in Crookston, Minn., and it seemed that at last we had an outfit that would run. We cleared about $3,500 in about 29 days' run for that season, this being the first good money we ever had made. Of course, we were accumulating in the line of horses and wagons, and last, but not least, experience.

About this time we managed to secure some land in British Columbia at the extremely low price of $1.00 to $2.50 per acre, and there being some 1,760 acres we had in a jump become land holders.

The season of 1907 will be a memorable one for the fact that we came to Canada. The threshing season in Washington was short, about 20 days, and on the 1st of September I bought a ticket to Claresholm, Alberta, to have a look round and see if there was any threshing in sight.

The crops seemed to be very good, and I sent a telegram to my brother to come. The year 1907 will be a memorable one to a good many farmers in Alberta, as on the 12th September a heavy snow storm swept the country, and the crops, being late, were swept down, perhaps 20 per cent. being in the shock, and money stringency topped off the rest of the bad luck. Our outfit arrived after about ten days, when along came three cars of effects, consisting of engine, separator, water tanks, some 13 wagons, 18 horses and harness. In shipping up those 500 miles, the C.P.R. touched us for about $950 freight, and the customs for another $350, being duty on our threshing outfit.

This first year in Alberta was not very prosperous, as the grain was not in a proper condition to thresh, being badly frosted and the straw long and tangled, so the business was very poor. As it was impossible to run and thresh at so much per bushel, we charged a matter of $10 per hour, and by this means netted from $40 to $50 per day. $50 per day may sound big to the thresherman in the East, but it is hardly enough in the West, as machines don't last very long and they cost large sums. So we did not consider ourselves very well off the first season.

The year 1908 was a Bonanza. The crops were very good, running in wheat from 15 to 50 bushels to the acre. Our clearings on this year amounted to about $4,000 in 37¼ days' run. Besides, we had a crop of about 240 acres which netted us a nice little sum.

In 1909 we had about 700 acres into crop, mostly wheat, but were unfortunate in having it badly frosted, and the threshing was poor that year, from the same cause. In the meantime we had filed on a homestead, and each located South African scrip on lands where we are now located.

We sold our British Columbia land at a net price of $12 per acre, and by that means we had a nice little bunch of money to work on. We have been buying and selling, and we now control 4,100 acres of land, 3,000 of which lie en bloc, with the balance in British Columbia.

I have cut the last part of the story a little short, but I think the start the most important in any young man's career. Start right, then go ahead. Even as I write I think of the hardships we have gone through and wonder is it worth it? I think it is simply the broadening out for a bigger future. We have a great country, one of great natural resources and one with a future and opportunities for all.

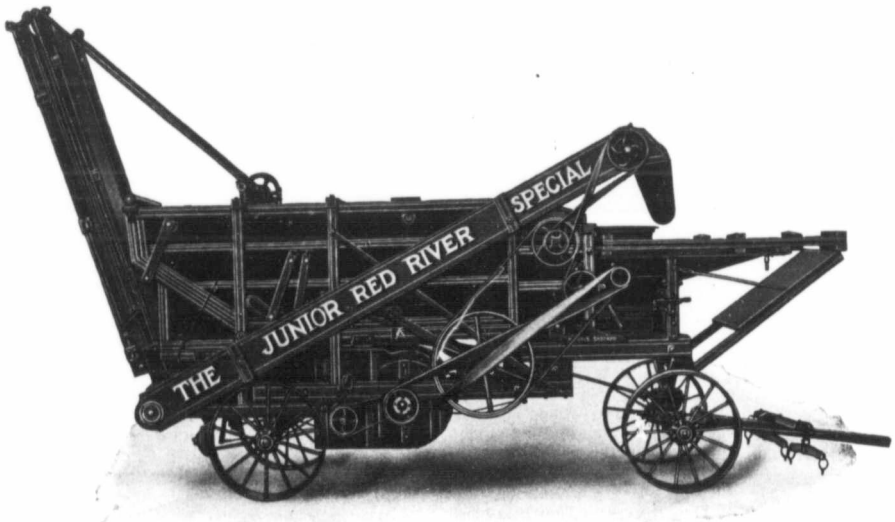
Yours respectfully, R. M.

HERE IT IS!

The Little Junior Red River Special

The SMALL THRESHER which does BIG WORK

The Ideal Machine for a country where the jobs are small. The Ideal Machine for a country where the roads are rough. The Ideal Machine for a Gasoline Engine.



The Junior Red River Special

Threshermen in all parts of the country made money with them last season—you can this. The only thresher for the Individual Farmer to buy. It does more and better work than any other so called small thresher ever built.

It BEATS the grain out of the straw just like the big Red River Special does.

It Saves the Farmer's Thresh Bill

It has "The Man Behind the Gun." Can be fitted for Steam, Gasoline or Horse Power. Can be equipped with Self-feeder or Wind Stacker.

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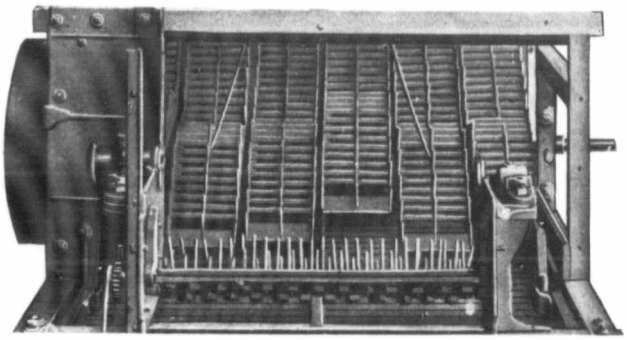
Conducted by Professor P. S. Rose

Practical Talks to Threshermen

Talk No. XLIII.

The Wood Brothers Humming Bird is one of the simplest machines on the market. The cylinder is set well down below the straw racks, and the straw is delivered on a level with the bottom of the cylinder, to a steep vibrating grate or rack which elevates the straw three feet six inches to the straw racks. There is no beater and the straw is thrown at full cylinder speed to the vibrating racks. At the beginning of the first straw



rack some wire springs are hung from the roof of the separator which reduce the speed of the straw to that of the separating racks.

These racks are made in five sections and operated by means of a multiple crank so arranged that when one section is up the adjacent section is down. This has the effect of agitating the straw and tearing the bunches apart.

The Huber separator depends upon the following principles for separation at the cylinder: A considerable distance to the first straw rack, two beaters running in opposite directions between which the straw must pass, and a flexible deflector back of the beaters which prevents the grain from being thrown back into the straw. The accompanying illustration shows the features of construction very clearly.

The Baker separator is fitted with a small cylinder. The first section of the grates right back of the cylinder is inclined at a very steep angle and ends in close proximity to the wings of the beater. Back of this set of grates and extending well under the beater, is an open slat work or auxiliary grate which is given an up and down as well as a rearward motion by means of a crank attached to the grain pan.

The beater is of peculiar construction, having a square central core to which are attached curved blades so arranged that the point of the winged blades enters the straw first and spreads it. As the straw breaks sharply over the first set of grates, it is struck by the beater and spread towards the sides of the machine. This is done ostensibly with the purpose of preventing the middle of the racks from being overloaded. It is a well known fact that the teeth midway between the ends of the cylinder wear out first, thus indicating that the largest amount of straw passes through at that point. This leads many designers to believe that it is well to use some device to spread the straw. Furthermore, the racks are usually several inches wider than the length of the cylinder and this is additional reason for some sort of spreader. There are many designers who believe a spreader is not necessary, and depend merely upon the vibration of the machine and the natural spreading action of the cylinder and beater.

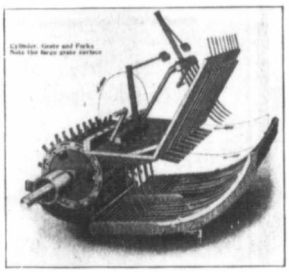
The Reeves. The next big cylinder machine to claim our attention is the Reeves. It has the usual large grate area, but differs from some of the other machines in having a separating rack that extends well down underneath the cylinder, and extends at rather a steep angle upward so that it must catch any kernels that escape the beater. The beater is star shaped and placed directly back of the cylinder, with a check board above it and the first rack clost underneath. The concaves are adjusted both front and rear.

The Rumely machine has a medium sized cylinder in connection with large grate area, as indeed all modern machines have. The cylinder is set well below the separating racks as in the Reeves and a raddle or endless carrier elevates the straw. The beater just clears the raddle and serves to distribute the straw evenly over the machine and at the same time tends to deflect grain through the open slat work of the carrier. At first thought this contrivance might seem to embody the ideas which I briefly hinted at in the last article, but it actually comes no nearer to it than any of the others I am describing.

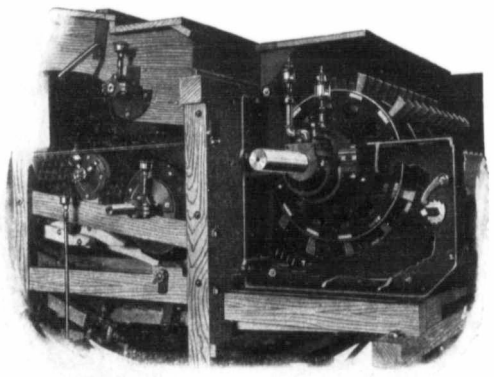
The Russel "Cyclone" thresher is provided with a large cylinder and two spiral wing beaters or spreaders set well back of the cylinder and only a short distance above the racks. The grates are arranged in such a way that the straw is thrown up against the first beater, which strikes it from above and throws the grain forcibly down toward the grain pan. The illustration of the Russell grates was shown in the last issue, but the write up, for some reason or other, did not appear.

The Advance thresher is provided with a pair of forks placed immediately back of the cylinder, which are operated by a two-throw crank. The grates extend straight back from the lower part of the cylinder for a short distance, and then curve upwards, keeping concentric with the path traced out by the points of the forks. The grates are in this way very greatly increased in area. The forks toss the grain upon a straw rack which is placed well above the cylinder and a considerable distance back of it. The flying kernels, therefore, nearly all shoot through the curved grates and fall on the grain pan underneath the straw rack.

In all of the machines which we have described there seems to be only one point upon which they all agree and that is upon the necessity for a large grate area. Features which are considered of the utmost importance in one machine may be entirely ignored in another and, in many cases, not even a substitute is provided to make up the deficiency. Yet in spite of all this, all of the machines are capable of doing good work when properly handled. It may be true, and probably is, that some machines will bear crowding much better than others, but upon this point we have no absolute and exact information. This much, however, appears to be certain: when we consider the great differences in construction close to the cylinder there must be a considerable difference in their separating capacity at that point. We do not suppose there may be any great difference in the effectiveness of the different machines as a whole



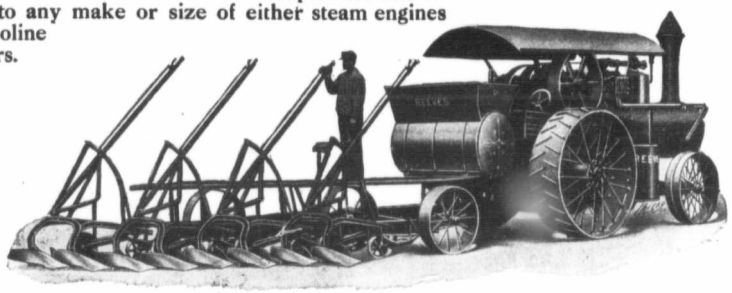
when the straw is finally disposed of, but there must be a difference in the effectiveness of some of the different parts of the various machines. In other words, some machines must do more separating on the straw racks than do others. Whether this is a serious disadvantage or not is an open question and one which we do not propose to discuss at this time, but will leave it to the designers and operators to fight out among themselves.



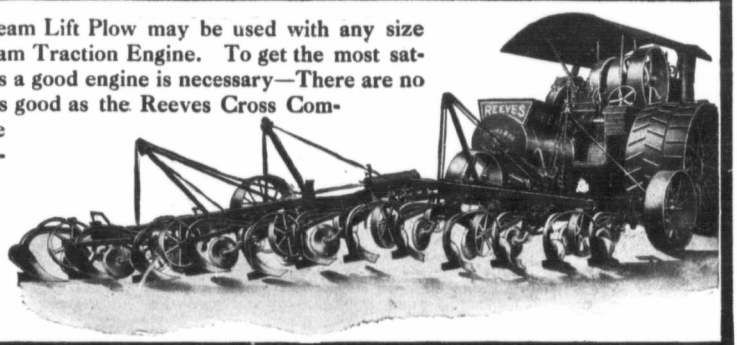
We have shown the different machines and discussed with more or less thoroughness the differences in design and the methods employed for separating the grain from the straw at or close to the cylinder. In the next lesson we will consider the principles made use of for further separation on the straw racks.

REEVES STEAM LIFT AND HAND LIFT ENGINE PLOWS LEAD THEM ALL·

The Reeves Hand Lift Plow is adapted for attachment to any make or size of either steam engines or gasoline tractors.



The Reeves Steam Lift Plow may be used with any size or make of Steam Traction Engine. To get the most satisfactory results a good engine is necessary—There are no other engines as good as the Reeves Cross Compound—Double Cylinder Plowing Engine.



Reeves Engine Gang Plows, both hand and steam lift, have flexible frames—permitting the plow frame and the plow bottoms to conform to the irregularities of the surface; the plows are attached to frame in pairs, each plow reinforcing its companion and adding strength. Each pair of plow bottoms are carried on wheels producing light draft. The attachment of the plow to engine is pivotal, permitting the engine to control the direction of the plow—A spring releasing device insures against breakage when plows strike a stone, stump or other obstruction. With the Reeves Plow turns to right or left can be made without lifting plows from ground.

The plow follows the engine—it is not a case of the "tail wags the dog", the engine controls.

The Reeves Plow attached to the engine by its pivotal connection makes an ideal plowing outfit—controlled at will by the engineer. Don't make a mistake—get a Reeves Flexible Frame Engine Gang Plow and be in line for a profitable run of work in fall plowing. The Reeves plow is unlike others—many of which are simply dragged on the ground by chains, like a lifeless log, capable of movement only as it is pulled by the chain or rope attaching it to the engine.

The Reeves Flexible Frame Engine Gang Plow—either style, hand or steam lift—will do more and better work than any other Engine Gang Plow made. They cost more than others, but then you know the best is the cheapest—the Reeves is the best.

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CANADIAN BRANCH : REGINA, SASKATCHEWAN

Sayings from Poor Richard's Almanac

A word to the wise is enough.

God helps them that helps themselves.

Dost thou love life? Then do not squander time, for that is the stuff life is made of.

A sleeping fox catches no poultry.

There will be sleeping enough in the grave.

Lost time is never found again.

What we call time enough, always proves little enough.

Sloth makes all things difficult, but industry all easy.

He that riseth late must trot all day.

Laziness travels so slowly that poverty soon overtakes him.

Drive thy business; let not that drive thee.

Early to bed and early to rise, makes a man healthy and wealthy and wise.

He that by the plow would thrive, himself must either hold or drive.

Always taking out of the meal tub and never putting in, soon comes to the bottom.

For want of a nail the shoe was lost; for want of a shoe the horse was lost; for want of a horse the rider was lost.

A fat kitchen makes a lean will.

A small leak will sink a big ship.

He that goes a-borrowing goes a-sorrowing.

Vessels large may venture more, but little ships should keep near shore.

The second vice is lying; the first is running in debt.

It is hard for an empty bag to stand upright.

Creditors have better memories than debtors.

Those have a short Lent who owe money at Easter.

It is easier to build two chimneys than to keep one in fuel.

Industry need not wish.

He that lives upon hope will die fasting.

Plow deep while sluggards sleep, and ye shall have corn to sell and keep.

One today is worth two tomorrows.

Constant dropping wears away the stones.

Leisure is time for doing something useful.

Keep thy shop and thy shop will keep thee.

If you would have your business done, go; if not, send.

Sloth, like rust, consumes faster than labor wears.

The eye of a master will do more work than both his hands.

Many a little makes much.

'Tis foolish to lay out money in a purchase of repentance.

Love, cough, and smoke can't well be hid.

Great talkers should be cropt, for they've no need of ears.

Light heeled mothers make leaden heeled daughters.

Wise men learn by other's harms; fools scarcely by their own.

A plowman on his legs is higher than a gentleman on his knees.

Kings and bears often worry their keepers.

He's a fool that makes his doctor his heir.

Hunger never saw bad bread.

Great talkers, little doers.

Beware of the young doctor and the old barber.

He has changed his one-eyed horse for a blind one.

The poor have little, beggars none, the rich, too much; enough, not one.

To lengthen thy life, lessen thy meals.

Men and melons are hard to know.

There is no little enemy.

The old man has given all to his son; Oh, fool, to undress thyself before thou art going to bed.

He has lost his boots but saved his spurs.

Doors and walls are fools' paper.

There's neither honor nor gain got in dealing with a villain.

Many dishes, many diseases.

Better slip with foot than tongue.

No man ever was glorious who was not laborious.

Don't think to hunt two hares with one dog.

Lawyers, preachers and tomtits' eggs, there are more of them hatched than come to perfection.

Happy's the wooing that's not long a-doing.

Teach your child to hold his tongue, he'll learn fast enough to speak.

An egg today is better than a hen tomorrow.

When it is fair be sure take your great coat with you.

Onions can make even heirs and widows weep.

Marry your son when you will, but your daughter when you can.

So God sends meat, they say; the Devil cooks.

The poor man must walk to get meat for his stomach, the rich man to get stomach for his meat.

He that goes far to marry will either deceive or be deceived.

The family of fools is ancient.

There's many a revenge in words, but words may be greatly revenged.

One mend-fault is worth two find-faults.

At a great penny-worth, pause awhile.

He that hath a trade hath an estate.

At the working man's house, Hunger looks in but dares not enter.

The cat in gloves catches no mice.

Little strokes fell great oaks.

Three removes are as bad as a fire.

The Value of Farmyard Manure.

Horse manure is generally more uniform in composition than that of other farm animals, on account of the uniformity in the kind and amount of food fed, being of a very dry nature it is extremely difficult to effect its thorough mixture with the litter, and for this reason it is liable to rapid fermentation. In this fermentation the nitrogen is converted into ammonium carbonate, which, being volatile, is likely to be lost; for this reason great care should be exercised in the preservation of horse manure. Good absorbing materials should be used as bedding; some preservative might be used, or the manure might be mixed with that from the cow stable with advantage to both.

Cow manure is much less constant in composition; it contains a large ppercentage of water, and is naturally colder and of poorer quality than horse manure. It ferments more slowly, and the risk of loss of volatile ammonia is not so great as in the case of the hot horse manure. Sheep manure is one of the most valuable produced by the various farm animals. It is much drier, is richer in nitrogen compounds, and ferments more rapidly than cow manure, but not as rapidly as horse manure.

Pig manure is very variable in composition on account of the wide variation in the character of the food. It contains much water and ferments slowly.

Poultry manure is one of the richest produced on the farm, containing a large amount of the various fertilizing materials, especially nitrogen. Being comparatively dry, it ferments rapidly, and in order therefore to prevent serious loss from the volatilization of the nitrogen, some preservative should be added to it. It may be mixed with the absorbents and manures obtained from the other farm animals which will prevent its too rapid fermentation.

The Thresherman's Question Drawer

Answers to Correspondents

Alphabet for the Steam Tractioneer.

A is the axles, just keep them well oiled,
B is the boiler where water is boiled;
C is the counter-shaft, keep it in line,
D is the differential, use grease, don't let it shine.
E is the eccentric, keep it up tight,
F is the friction-clutch, adjust it aright;
G is the gearing, it's used on the pull,
H is the hood, don't let the meshes get full.
I is the indicator, used by the expert,
J is the journals, just keep out the dirt;
K is the kinks with which you will meet;
L is the levers, keep them tight at their seat.
M is the main shaft, don't let it get warm,
N is the noises, which are sure to alarm;
O is the oil, always use a good kind,
P is the Piston, be sure it don't bind.
Q is the quadrant of the reverse,
R is the rods, they need watching, of course;
S is the steam, you will need lots of it,
T is the taps, be sure they all fit.
U is the upstroke of the feed-pump,
V is the valves, don't let them thump;
W is the water gauge, watch it with care,
X is xpenses, you'll sure have your share.
Y is the youth who is learning to run,
Z is the zero, where the rest have begun.

—Composed by Horace Macdonald, Miniota, Man.

L. A. Q. Which is the best for a traction engine, a single or double connection lubricator; and how should they be connected, to the steam pipe or to the steam chest of the engine?

A. A single connection lubricator is the most convenient to connect as there is but one connection to make; but it is generally believed that it is not as sure in its work as is a double connection, as, there being but one connection, the pressure is the same on the tube which supplies the water as it is on the discharge tube for the oil, there being nothing to force the oil into the steam but gravity. The water being heavier than the oil and there being a little more head to the water than to the oil, the oil is forced into the steam in this way. One can readily see that a little obstacle in the way will cause the lubricator to fail to supply the oil.

If a double connection lubricator is connected so that the connection for the water supply is taken from the steam pipe between the governor and the boiler, and the lubricator proper is connected to the pipe between the governor and the steam chest or directly to the steam chest, the lubricator will have an advantage in that it has more pressure on the water supply pipe than it has on the discharge end. Since the water supply pipe is a separate connection it can be built above the lubricator and thus get a greater head of water, and if the water or steam pipe of the lubricator should be connected to the same part of the steam pipe of the engine by having the water pipe built up considerably higher than the lubricator, the double connection lubricator will have the advantage over a single connection lubricator in that gravity can help more, due to the greater head of water, and thus overcome more of the troubles which are so common to the cylinder lubricator.

G. W. Q. Is there any advantage for a straw stoker for a traction engine other than a labor saver?

A. With a good straw stoker much of the trouble of leaky flues will be avoided; as in firing by hand, at times too hot a fire is made, and then often the fire is allowed to die down suddenly. With the stoker a more steady fire can be had and there should not be any more tendency to leaky tubes than with coal for fuel. The accumulating of ashes on the tube sheet will also be reduced, as there will not be so muh stirring of the fire and thus reduce the tendency of the straw to fly through the fire.

R. J. Q. One of experience knows well that after turning water out of boiler that a small quantity of water always remains in the boiler. Can such water damage boiler by freezing?

2. Is mud in boiler injurious to the plates?

3. Is there danger of the water gauge glass blowing out when the engine is under steam and standing idle?

4. Is it injurious to glass to shut the water out when going to dinner or for any other purpose?

5. Will glass become hot and break?

6. Is lead a good alloy for filling of any plug?

A. If water is left in a water bottom boiler, there must be enough to fill the space between the two sheets to do any damage to the boiler, as it cannot force the sheets otherwise.

2. It is not especially injurious if it does not get up to the fire-line.

3. The glass is as likely to break while boiler is under pressure with the engine idle as with it running.

4. It is not injurious to the water glass to shut the water out at times, but it will surely injure its value as a gauge, and that is what it is there for. Better not shut it off unless absolutely necessary, and turn it on again as soon as the necessity for closing it is past. It is not necessary to shut off when going to dinner.

5. The expansion and contraction, owing to heat, is no doubt the cause of glass gauges breaking at times.

6. Tin is better than lead as it melts at a lower tmeperature.

J. S. Q. Why is it that a return flue boiler takes less coal for the same amount of work than a straight flue boiler?

2. Why is it that a straight flue boiler or engine has more power than a return flue engine while pulling up a steep grade?

I have seen 12 to 16 h.p. engines pull their load up hills where the large 20, 22, and 25 h.p. return flue engines could not pull. When it comes to the hard pulls their piston stops. They seem to be powerless, like a gasoline engine when overloaded.

A. It is a fact that some return flue boilers are more economical on fuel than some straight flue boilers, and some straight flue boilers are more economical than some return flue boilers. It all depends on the construction and condition of the boiler. In making comparisons between two boilers, the heating surface should be considered rather than the nominal horse power of the boiler. There is another condition that may be misleading in such a case; if the engine on one boiler is more wasteful than the other, that boiler will take more coal to do the work. However, the boiler with the wasteful engine will take more water, and the trouble can be located by observing the amount of water used.

2. The boiler with the strongest engine and the best arranged gearing will pull the load up a steep hill the easiest. The writer is inclined to think the straight flue boiler engines are under-rated, or the return flue boiler engines are over-rated. It may be that neither kind are properly rated to the common standard of nominal horse power. The pulling qualities depend on the size of cylinder, boiler pressure, revolutions of engine and speed of engine on road. The latter is governed by a ratio of the revolutions of the crank shaft to the circumference of the traction wheels. A small engine with gearing arranged so that with a certain number of revolutions of the crank shaft, it will travel slower on the road than a larger engine with the same number of revolutions of the crank shaft, and gearing arranged so that the speed on the road is faster, the smaller engine may pull more than the larger engine, but it will take a longer time to do the work due to the slow travel.

G. R. .Q. I have an engine, and I can't get the valve set to my liking. When the engine is on the centre and the reverse lever is in the last notch, the valve opens one-eighth of an inch more at the end in which the engine is running, and when it is reversed it opens one-eighth of an inch in the direction which it is running. Please tell me in the Canadian Thresherman how I can get it right, or if there is anything wrong with the valve gear.

A. This is a common failing in most all valve gears. In fact it indicates that a more important point than equal port opening is correct. If a valve gear would show an equal port opening with an equal lead, the point of cut-off would likely be unequal. So the chances are your engine is all right. This discrepancy in the port opening, lead and cut-off, are due to the angularity of the connecting rod, and it can be shifted to a point where it can do the least harm. The discrepancy can be overcome in four-valve engines where each valve can be set independently, but in a single valve the motion cannot be made perfect.

F. W. T..Q. Which will consume the most steam doing 20 horse work, simple 9 x 10, or compound 7¾ x 10 and 11 x 10, and which engine would require the large boiler?

A. Both engines being well designed and in good condition, the compound engine will do 20 h.p. (nominal) with about 20 per cent. less steam than the simple. Both engines will take about the same size boiler to supply steam to work to the full capacity of the engine, the compound engine being of about 25 per cent more capacity than the simple engine.

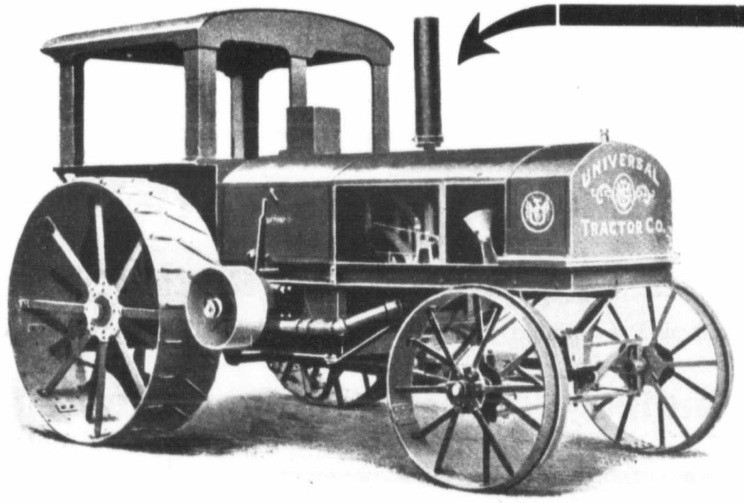
L. B. Q. I have an injector with three-fourths-inch connection. It will force water into the boiler very well with 70 to 80 lbs. of steam, but with from 100 to 120 lbs. of steam it will not force the water into the boiler at all—runs out at overflow.

A. There is only a limited range to the pressure at which an injector will work. If it works at a very low pressure it will not work at a very high pressure, and if it works at, say, 120 lbs. it will not work at the low pressure, say 20 or 30 lbs.

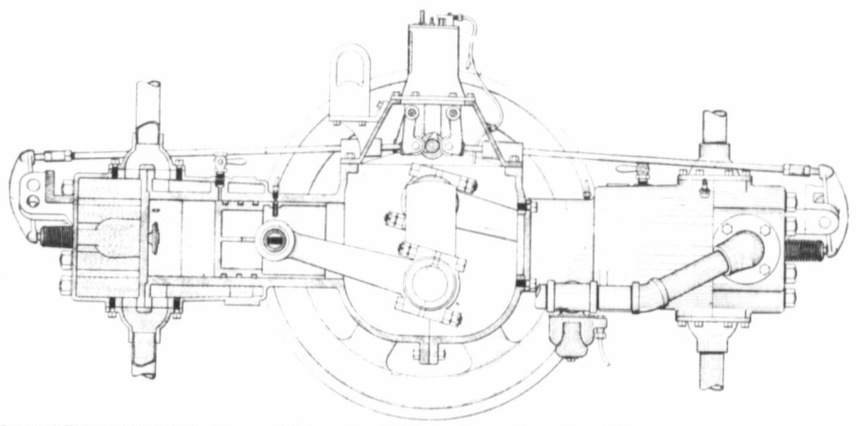
The jets may be cut out due to working sandy water. If this is the case, send to the manufacturer of the injector for new jets and state at what pressure you want it to work, and they will send you the proper size jets. Before you do this, see that everything is clean about the injector, and that the delivery pipe to the boiler is free. The fact that the injector takes the water and delivers it at the overflow would indicate that the suction pipe is tight.

HERE IS YOUR NEW HORSE

Look him over, see if you can find any spavins, ring bones, swollen joints or sore feet. You will find no blemishes on the new horse. You will find him worth just as much at the end of the season as he is now.



Universal 20 H.P. Tractor. (40 H.P. Brake Test.)



Sectional View of Universal Double-opposed Motor. One Cylinder is shown as if cut through the center lengthwise, the better to illustrate the piston, valve, waterspace, etc.

I have just returned from the factory at Stillwater, Minnesota, where I bought their entire output of these horses, everyone the same color, weight and size; each one worth just the same price as the other.

Let your new horse be one of these horses. I am calling the new American-Abell Universal Farm Motor a horse because it will take the place of your horse in doing your farm work. Here is what the American-Abell Universal Farm Motor will do and do it better than draft animals and at less cost:—

Plowing

One man and twenty-five gallons of gasoline will plow eighteen acres of ordinary stubble in ten hours with the Universal. Besides, if rushed, you could run nights by putting on another man. Plowing with horses, figuring a man's labor $3.00 per day, and reckoning the horse feed only while engaged in plowing costs per acre $1.00. Plowing with the Universal, and figuring a man's labor at $3.00 per day; $1.00 per day for lubrication and gasoline at 15 cents per gallon, costs per acre 45 cents.

Seeding

If an engine draws six 14-inch plows, how many seeders will it haul? As many as sixteen good, big draft horses; and it only takes one man. You can combine harrows, seeders, crushers, packers, etc., according to the needs of the land, and prepare a better seed-bed and do a better job of seeding and leave the ground in better shape than with animal power, and at less than half the expense.

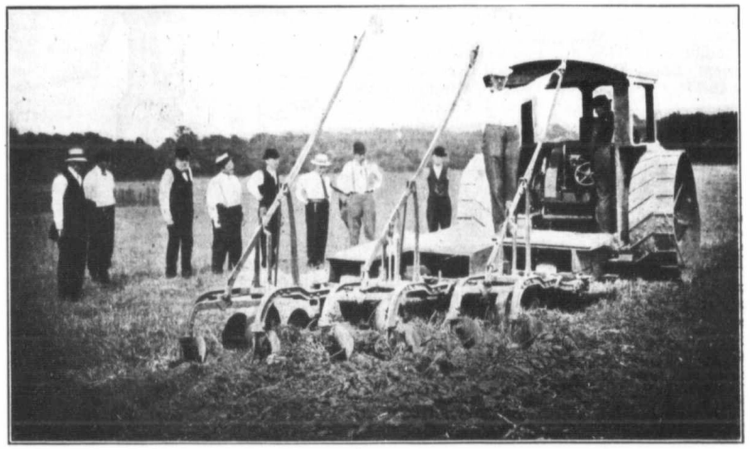
It will harvest your crop and thresh it better and cheaper than your standard bred horses. What I saw at the Universal Factory I wish you could see. I wish you could see one of these motors assembled. I wish you could see the care exercised in fitting each joint. The Universal Farm Motor is assembled and fitted with as much care as is possible to exercise in manufacturing and assembling five thousand dollar automobiles.

If you have never seen an automobile assembled it is hard for you to realise just what care there is exercised in grinding a joint to the one-thousandth part of an inch.

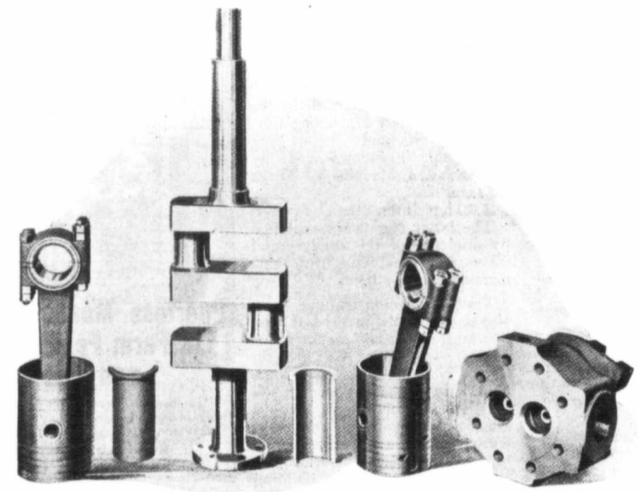
A gas engine fitted with the care that the Universal is, is sure to give good results. It is sure to do your bidding if you keep it properly adjusted and well oiled.

The American-Abell Universal Farm Motor has just been added to our old and reliable line of plowing and threshing machinery, not because our Steam Plowing Engines do not do the work satisfactorily, but because there are certain conditions and certain trades we cannot reach with Steam engines. Conditions are changing and we must keep up to the times, so we have added the latest and most up-to-date motors to our line. The American-Abell Universal Farm Motor, the Minneapolis Farm Motor, the Warren Detroit Automobile are all new lines with us; they are the latest products of up-to-date America.

Write us for full particulars and catalogues on each of these lines. Our lines are all up-to-date and well baited, and you will be sure of a real catch if you only use our bait.



The Universal Tractor Pulling Six 14-inch Plows.



The above cut shows the Universal's one-piece, 3½-in. crank shaft, crucible steel connecting rod, long piston, heavy interchangeable bushings and cylinder head, showing valve seats.

Our Creed: We believe that honest goods can be sold to honest people by honest methods

It is a pleasure for us to show our goods, you should look them over and compare them with other makes, then judge for yourself. Make our office your headquarters when in

WINNIPEG REGINA SASKATOON TORONTO CALGARY EDMONTON

American-Abell Engine and Thresher Company, Limited.

We Represent **THE ADVANCE THRESHER CO., BATTLE CREEK, MICH. AND THE MINNEAPOLIS THRESHING MACHINE CO., HOPKINS, MINN.**

The Agricultural Societies' Annual Convention at the Manitoba Agricultural College, and Farmers' Short Course, February 13-17

The annual convention of the Agricultural Societies of Manitoba, the Household Science Association, the Manitoba Horticultural and Forestry Association, the Manitoba Dairymen's Association, and the Agricultural Societies' Seed Grain Exhibition, together with the Short Course for Farmers, were held at the Manitoba Agricultural College during the week of Feb. 13-17, inclusive.

There was excellent weather during the whole of the week. Over 150 farmers registered for the short course, besides 125 registering as delegates from 63 different agricultural societies throughout Manitoba. 49 women delegates registered from 16 different household science associations throughout Manitoba. Altogether this was one of the most successful conventions, and one of the most representative of the rural population of Manitoba that has ever been held at the College.

The programme of lectures for the farmers' short course included lectures in Animal Husbandry, the Selection and Raising of Hogs for Market, the Selecting and Breeding of Beef Cattle, the selecting and Breeding of Draft Horses, the Selecting and Breeding of Dairy Cows, and the Selecting and Breeding of Sheep.

The first and last of these lectures were given by Prof. W. H. Peters, of the college staff, while the other three lectures were given by Mr. R. E. Drennan, manager of the Pioneer Stock Farm, Canora, Sask, and formerly of the Extension staff, Iowa State College.

Most of the animals used for demonstration purposes belonged to the college, with the exception of some of the beef cattle and a few of the draft horses.

Three of the beef animals used were from the herd of Sir Wm. Van Horne, East Selkirk, the leading animal being the famous Spicy's Rose. Some fine specimens of the draft horse were kindly loaned by the Clark Coal Co., of the city, these being magnificent animals of their type.

The other lectures of the short course included judging flax, and grass seeds, judging wheat, judging oats, judging barley, and the identification and eradication of weed seeds. These lectures were given by Prof. Bedford, of the M.A.C. staff.

The lectures in Agricultural Engineering included the Gasoline Engine on the Farm, Painting and Care of Farm Buildings, Protection from Lightning, Principles of Concrete Work, a Practical Demonstration in the Handling of Gasoline Engines, and the Modern Farm Water Supply. These lectures were given by Prof. L. J. Smith, of the college staff, who was ably assisted by D. Cormack, demonstrator in carpenter work, and in the operation of gasoline engines by several undergraduates and freshmen

In the practical demonstration of the handling of gasoline engines, the following makes of engine were used:—

A 6 h.p. Olds, made by the Saegar Engine Works, Lansing, Mich.

A 2½ h.p. "Goes like sixty," by the Gilson Manufacturing Co., of Guelph, Ont.

A 1 h.p. "Pompom," made by the D.C.N. Co.

A 5 h.p. Fairbanks-Morse oil cooler.

A 4 h.p. International water cooler.

A 2 h.p. "London," made by the London Concrete Machinery Co.

A 5 h.p. Stickney.

A 5 h.p. "Brandon," made by the Brandon Machinery Works Co., and

A 20 h.p. International Tractor.

The latter engine was handled by students of the college, and its various capabilities were ably demonstrated by them.

Practical demonstrations were also shown in the method of mixing and laying of concrete for concrete sidewalks. Also in making of concrete building blocks. Upon the second floor of the Mechanical building, various kinds of iron working and wood working machines were on exhibition, all in active operation. On the third floor of the building were exhibited farming machinery of every description. There were plows all the way up from the humble stubble walking plow to the eight-bottomed steam plow. There were drills, four-horse cultivators, hay loaders, hay tedders, manure carriers, manure spreaders, disc harrows, spring-toothed harrows, and, in fact, every kind of implement that the modern farmer would wish to have. Prof. Smith was a busy man the whole week.

The short course men also had lectures in Farm Dairying by Prof. Mitchell, M.A.C.; lectures on How to Improve the Farm Home by Prof. Broderick; lec-

tures on Detecting Lameness and How to Administer Medicine to a Horse, by Dr. Torrance, D.V.S. Also a demonstration on the cutting up of the beef carcase, by Prof. Peters, and a lecture on Poultry keeping, by Dr. A. W. Bell.

These lectures were given in the various class-rooms, the engineering building, and the stock-judging pavilion, as the case required. The class was divided into two sections to facilitate handling, and every student, gray-haired or in his teens, carried his notebook and pencil around with him just like the every-day resident student. They all keenly enjoyed it, and many expressions of gratitude and of pleasure at the knowledge gained while attending these lectures were heard from all sides.

The agricultural societies opened their convention on Feb. 14 with J. G. Barron, president, in the chair.

Addresses at this convention were delivered by the Hon. G. R. Coldwell, Minister of Education, J. J. Golden, Deputy Minister of Agriculture, Prof. Bedford, Prof. Peters, W. J. Crowe, instructor in butter making, Principal Black, Miss A. B. Juniper, Prof. of Domestic Science, and many others.

The report of the managing director, Prin. Black, was read by the assistant manager, W. W. Thompson, a graduate of the 1911 class. The report in part was as follows:—

The societies in the province had increased from 58 in 1909 to 62 in 1910. The total membership, as shown by the reports received to date, has increased from 6,555 to 7,462, an increase of 907 members, or approximately, 14 per cent. In addition to this 17 associations for women have been organized and now have a membership of over 500.

During the past year 66 exhibitions were held in the province.

Each of the five agricultural and arts associations held an exhibition, and 61 out of the 62 agricultural societies held shows. Judges were supplied to 59 of them, and in almost every case the reports received indicate that the fairs were an improvement on those of previous years.

There is one criticism made by several judges, which we believe applies to the great majority of our fairs, and that is that not enough attention is given to the sheep raising industry. Only in two or three cases are good exhibits of sheep reported, and in many places few or none were shown.

During September a circular letter was issued to all societies in the province offering to supply speakers for a meeting for women, and asking all societies desirous of holding such meetings to communicate with the managing director before October 1st.

Twenty-two meetings were arranged for, and as a result of these, 14 household science associations were formed, and three societies which had been independently organized have decided to join with them.

E. W. Jones read a paper on the value of plowing matches. Prof. W. H. Peters spoke on the improvement of stock departments at the agricultural societies' shows, W. J. Crowe on the dairy departments, and Principal Black on the scope and importance of agricultural extension work.

The Hon. G. R. Coldwell addressed the delegates on the practical education as manifested by the work done at the Manitoba Agricultural College. He deprecated the educational policy as pursued during the past 500 years, which had developed the mind to the neglect of the hands and body. He spoke at length on the value of practical education along the lines of technical and industrial courses, to supplement the "rule of three." He called attention to the fact that fifty years ago when technical and industrial education were still a mooted question, that Professor Jonathan B. Turner had predicted the success of such training, as society was necessarily divided into two classes, professional and industrial.

Mr. Coldwell said he could see that the very greatest benefits would accrue to the province as a result of this class of education. It will be to your interest to pull down every one-roomed schoolhouse in Manitoba and rebuild it on a different scale and on a different principle. This is what the education department of this province will try to persuade the people to undertake, to change the country school and make it better, and establish in country districts proper country high schools, where farmers' sons and daughters may have the same equal opportunity for education as the merchant's sons and daughters in the city possess. Beyond a doubt there was no better class of it than the agricultural college is supplying; but there was the other side to furnish this education for, and the attempt is to create a better balance. In all this effort the people must rise to the situation. In concluding, Mr. Coldwell expressed his pleasure at seeing so many persons every year taking an interest in the agricultural college and its lectures.

Prov. J. H. Hoverstaadt, of the North Dakota Agricultural College then addressed the convention. The professor said, "Here in Winnipeg you have a model of an agricultural institution that is ideal, and marks the beginning of a great institution. You are just beginning, and are becoming better. We should all try to keep the ideal ahead of anything we can ever accomplish. Between the college and the farmer there is a chasm which has been partially filled by farmers' institutes. Mental education is dying out, the theoretical giving place to practical education. Education taxes you, but for every $1,000,000 for education, you are paying $10,000,000 for ignorance. With education, 20,000,000 more bushels of wheat would be grown in North Dakota annually.

Miss A. B. Juniper, Professor of Household Science at the college, also briefly addressed the meeting. Miss Juniper said that of all work for women home-making is the finest and demands the highest type of woman for its best fulfilment. She regretted that many did not consider it a remunerative employment, comparing it unfavorably with stenography from social and other standpoints.

"To many, housekeeping is a drudgery," declared Miss Juniper. "Now, drudgery is simply work badly done, possibly through not understanding it, whereas work rightly done is a joy, the most satisfying and lasting joy of life.

Ventilation, water, food, especially plain and unadulterated foods, were in turn discussed at length. Miss Juniper laid special stress on the need of training the children in sanitary science and in habits of right living and eat-regret the mistakes of their paring, in order that they might not ents. In conclusion, Miss Juniper urged the men to do all that lay in their power to help their wives, daughter, and sisters, realizing that their advancement meant the advancement not only of the family, but of the nation as well.

P. B. Tustin, chief of the food division of the Winipeg health department, discussed at the dairymen's meeting, "Cause and Prevention of Tuberculosis in Dairy Herds." Mr. Tustin said in brief that tuberculosis is a preventable disease, but before any marked results can be made in the fight now being waged against it in all parts of the civilized world, it is necessary that the people interested in the farming and cattle industries should thoroughly understand the cause of the disease, the manner in which it is spread, from one animal to another, and the best methods of fighting against it.

Cattle became infected with the germ in three ways: First, by eating food contaminated with the bacilli. Second, by innoculation—the bacilli getting into cuts and sores. Third, by breathing impure air. In winter time the majority of farmers stuff up all the openings in the barn with bags of hay or other things. They are afraid the stable will get too cold. Consequently, the air becomes very impure, and if the cattle do not get tuberculosis they get other complaints caused by impure air. The cattle should be given plenty of fresh air, the barn should be kept warm and clean. In summing up, the speaker said, do your part in this campaign against the great white plague. The remedy is cheap and costs you nothing: cleanliness, fresh air, good food.

The horticulturists also held a successful convention. A discussion on the planting of trees for windbreaks and shelter belts was le by Norman Ross, of the Indian Head Forestry Branch. The speaker advocated that planting trees four feet apart each way was the most profitable method as proven by experiments. J. J. Ring, of Crystal City, followed in the discussion, and agreed in most everything that Mr. Ross had said with regard to the distance apart of tree planting. Mr. Middleton, of Brandon, and Mr. W. H. Holland, of Swan Lake, also spoke interestingly upon this subject.

Mr. Ross then spoke for a few minutes on establishing evergreen belts for shade purposes. Mr. Ross advocated planting hardier kinds of trees first as a shelter for the young evergreens, for if they were planted out in the open with no shelter they would soon wilt and die off. He also advocated planting the evergreens taken from the lower lying levels, for, as a rule, they were much hardier and younger than those found on the higher levels.

Prof. A. H. Reginald Buller, of Manitoba University, then gave a splendid illustrated address on the "Destruction of Wood by Fungi." The professor showed views of the destructive work of the spores of fungi as they acted within the cells of woody plants. The professor also had numerous exhibits along with him showing diseased wood caused by fungi, also numerous samples of the fungi themselves.

Abraham Knuthl, Inspector of Forest Reserves, also gave a very interesting and instructive illustrated address on the Forests of Europe and Canada. The lecturer showed many splendid views of the various forests of Europe and Canada, and also views of the method of their reforestration. This was a very instructive lecture, and showed the strenuous efforts that the government of Canada is making to preserve her natural forests from annihilation by ruthless lumbermen.

An excellent week was spent altogether. The grain exhibit also was very good, some one hundred entries being entered for the various prizes offered.

The trophy donated by Farm Crops for the best sample of wheat grown in Manitoba was won by Thos. Maynard, of Delorraine. The sweepstakes prize cup for the best oats, donated by the Nor'-West Farmer, was won by Wm. Grogan, of Treherne. He also won the silver cup sweepstakes prize for the best sample of barley. This prize was donated by Randall, Gee & Mitchell.

The samples of grain on the whole were very good, considering bad the season of last year. The north-west districts of Manitoba took the bulk of the prizes.

Number of Trees to an Acre

4 feet apart each way ...	3,720
5 feet apart each way	1,749
6 feet apart each way	1,200
8 feet apart each way	689
10 feet apart each way....	430
12 feet apart each way....	325
15 feet apart each way....	200
18 feet apart each way....	135
20 feet apart each way....	110
22 feet apart each way....	70
30 feet apart each way....	50

See Premiums in Wheat Guessing Contest

The Building of a Hotbed.

Complete Directions, Including the Building of the Frame, Protection from Severe Cold and Heavy Winds, and the Preparation of the Heating Material—The Experience of one who has Tried It.

A hotbed is a necessity to the amateur who raises his own seedlings of tomato, cauliflower, lettuce, celery and early cabbage, instead of buying them in the spring from the seed stores. The great advantage of knowing exactly what varieties one has is obvious. There is no mystery about the making of a hotbed, yet many people, just because they never understood how, are content to go on year after year in the old way. The warmest and most sheltered spot on the place is the one situation for the hotbed.

There was room for seven sash, each 3 x 6 feet. For the frame, 2 x 3 joists and some 1 x 10 cypress planks were bought. On the ground where the hotbeds were to stand a space about 20½ x 5½ feet was dug to a sufficient depth so that when the frame work of the planks was set up and levelled, the interior space was four feet deep.

Posts set firmly at each of the four corners, and others at equal intervals on each side, furnished support for the planks.

The south front of the frame was made by one plank, the back being formed by two planks. This gave the "slope to the south" at an angle of about 30 degrees. which means catching the most of the sun's heat and light.

Six 1 to 3 joists running from back to front (north to south) support the sash. No grooves were made, as the sash was plain and without the tongues formed on more elaborately finished sash frames.

Three feet of fresh stable manure, well drenched with water, made the heating material. The frame was then closed up, and two days later the soil for making the bed was thrown in. Earth was banked firmly around the frame, then an outer fence of old boards was built about two feet from it on the north side, and the intervening space filled with manure, more of which was tightly banked around the ends and on the south side to prevent frost from entering.

It is no use making a hotbed and allowing all the heat to escape, so the glass of the sash must have some covering, otherwise it will radiate to an excessive degree. There are various possibilities, of course—straw mats covered with old matting or carpet, boards, burlap, oiled or paraffined cloth, etc.

Our preference was for salt hay, and, as this is too short to braid or weave, we made a thin mattress-like affair about four inches deep of unbleached muslin sheeting. It takes five yards of unbleached muslin two and a quarter yards wide, a couple of wheelbarrow loads of salt hay, a small quantity of twine, and about four hour's time to make the mattress mat. The regular six-foot straw mat made on a frame, takes four sheaves of rye straw, a ball of twine, and two and a half hour's time.

The whole is covered with a waterproof covering of some sort, to prevent snow or rain from soaking through. This can be accomplished by having the waterproof cover long enough to fasten down on the ground at each end of the frame. If attached to a wooden roller, it will facilitate the uncovering.

Useful Information.

To find the diameter of a circle multiply circumference by .31831.

To find the circumference of a circle multiply diameter by 3.1416.

To find area of a circle multiply square of diameter by .7854.

To find surface of a ball multiply square of diameter by 3.1416.

To find side of an equal square multiply diameter by .8862.

Double rivetting is from 16 to 20 per cent. stronger than single.

To find cubic inches in a ball multiply cube of diameter by .5236.

Doubling the diameter of a pipe increases its capacity four times.

One cubic foot of anthracite coal weighs about 58 pounds.

One cubic foot of bituminous coal weighs from 47 to 50 pounds.

One ton of coal is equivalent to two cords of wood for steam purposes.

There are nine square feet of heating surface to each square foot of grate surface.

Each nominal horse power of a boiler requires 30 to 50 pounds of water per hour.

To sharpen dull files lay them in diluted sulphuric acid until they are eaten deep enough.

Buffalo—Pitts Enters Canada.

Recently we enjoyed a very pleasant visit from Mr. Wagner, manager of the Fargo branch of the Buffalo-Pitts Company, also from Mr. George Flett, who for a number of years has been connected with the Buffalo-Pitts Company.

These gentlemen informed us that the Buffalo-Pitts Company have opened up a branch house at Moose Jaw, which is to be located at 25 High Street West.

The Buffalo-Pitts line has been well and favorably known in Western Canada for a considerable time, and it was to meet the ever pressing demand for their goods that the above move was made. A full and complete line of Buffalo-Pitts Triplex Gas Tractors, Buffalo-Pitts separators, together with a complete line of repairs will be kept at the above place.

The new branch house will be in charge of Mr. George Flett. Mr. Flett will be pleased to talk Buffalo-Pitts to anyone interested in the above line.

We are pleased to welcome this concern into Western Canada, for we feel that their coming here will make many a thresherman and traction plowman happy.

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.

And now for anecdote and story. A man addicted to walking in his sleep awoke one night to find himself in the street in the grasp of an Irish policeman. "Hold on! Hold on!" he cried. "You mustn't arrest me — I'm a somnambulist!" "I don't care whether you are a somnambulist or an unitarian," said the policeman. "You can't walk the streets in yer nightshirt!"

Pat was no astronomer, but next to his pipe, he loved to be "up-to-date." A friend had been telling him about an approaching eclipse of the sun. That night Pat sat on his door-step, patiently puffing away at his old pipe. He would light a match, pull at the pipe, and then, as the match burned out, try another. This he did till the ground was littered with burnt matchwood. "Come to supper, Pat!" called his wife from the kitchen. "Faith, an' Oi will in a minute, Biddy," said he. "Moike has been a-telling me that if Oi smoked a bit av glass, sure I could see the shpots of the sun. Oi don't know whether Moike's been a-fuolin' me, or whether Oi'm smoking the wrong kind o' glass."

A son of Erin appeared at the money-order window of a post office, and said that he wanted to "sind some money to ould Oireland." "Fill out this form," said the clerk, handing the applicant one of the forms used on such occasions. "An' phwat is that?" asked Jerry. "It's a form that every applicant for a money-order must fill out, a kind of letter of advice regarding the order." "An' phwat has a letther of advice got to do wid me sindin' fifty shillings to me ould mother?" "A letter of advice to the postmaster where the money is to be paid must always go with the money-order." Jerry went away from the window, grumbling and mystified. After half-an-hour of painful effort at a high desk provided for the public at one end of the room Jerry returned to the window and handed in this "letter of advice" to the post-master at Bally-carney:—"Dear Moike,—Oi'm tould Oi must give yez a bit av advice before you'll be able to pay me ould mother the fifty shillings Oi'm sindin' along with this. So, Moike, Oi' wouuld advise yez to come to Ameriky an' get a job at kaping post office, for its illigant post offices they has here, an' Oi've no doubt the pay is tin toimes what it is wid you, and any fool can do the work. So now be sure an' pay me ould mother the two pounds ten, for Oi've done as the law says, and sint yez a letther of advice."

The Customer—Mother sent me back with these matches; they don't strike.

The Shopkeeper — Of course they'll strike. Didn't you see me light one on my trousers.

The Customer—Yes; but mother says she hasn't got time to come here and borrow your trousers every time she wants a light.

In a leading firm in Fleet Street the manager had occasion to reprimand several of his clerks for not being punctual, and threatened them with serious consequences if they were again late. On the following morning an Irishman entered the office a quarter of an hour late, and when asked for an explanation replied—"The bus I came by was full, so I had to walk."

A wealthy Irish-American was proud of the opportunity to do honors and "show off" on the occasion of a visit to New York of one of his compatriots from the "Ould Country." To dazzle him he invited him to dine at one of the most notable and toniest of restaurants. "Now, me bhoy," he said, "just you follow my lead, and I'll order everything of the best." Seated at table, the host led off with — "Now, we'll start with cocktails," meaning, of course, liquid appetisers. "Waiter, fetch a couple of cocktails." His friend gave himself away, however when the whispered audibly — "Waiter if yez don't moind I'd rather have a wing of the bird."

In one of the principal streets of Dublin a stranger accosted an Irishman with the question — "Could you tell me the way to the station, Pat?" To this the Irishman replied—"Shure, but how did you know my name wor Pat?" "Why, I guessed it." "Well, seeing you're such a good guesser, you can guess the way to the station," was Pat's retort as he passed along.

An Irish sailor, being desired to heave in a bucket of rubbish, threw it over the ship's side by a rope, which broke while being hauled up, and the bucket, being full, very naturally found its way to the bottom of the ocean. Poor Paddy was by this accident thrown into a fit of perplexity, and fearing the displeasure of the captain, he resolved to extricate himself from his dilemma by the following singular specimen of nautical logic. Going up to the captain with a grotesque bow and a humorous grin — "Long life to your honor's riverence," he said, "and might I be so bowld as to spake a civil word wid you" "Well, my man," replied the officer. "What have you to say?" "Shure, then," said the tar, "and it's myself, Pat Mullins, would be axing your honor, can a thing be lost when you know whereabouts it is?" "Certainly not," said the captain; "but wherefore do you ask so foolish a question?" "Blud and ouns, then," said Paddy, "the bucket I let overboard a while ago is not lost, for I can tell where it is—sure enough, it's safe and sound at the bottom of the sea!"

"Bridget, here's a letter from the ould country," said Pat. "Well, hurry up and read it till we hear the news," said Bridget. "Shure, Bridget," said Pat, "I can't read in the day toime; I was taught in a noight school."

A clergyman in Cork one day remarked to his servant — "Patrick, I shall be very busy this afternoon, and if anyone calls I do not wish to be disturbed." "All right, sor. Will I tell them you're not in?" "No, Pat, that would be a lie." "An' what'll I say, yer riverence" "Oh! just put them off with an evasive answer." At supper-time Pat was asked if anyone had called. "Faix, there did," "And what did you tell them?" asked the priest. "Shure, an' I give him an evasive answer." "How was that?" queried his reverence. "He axed me was your honor in, an' I sez to him, says I, 'Was your gran'mother a hoot owl?"

"Pat, whoi are yez so often dhrunk whin yez come to mate me?" reproachfully asked an Irish girl of her lover. "Shure, me darlint, it's all through yer purty face," replied Pat, with an admiring glance. "Away wid yer nonsense!" exclaimed the girl. "Phwat has me 'purty face,' as yez call it, to do wid yez gettin' dhrunk?" "Whoi, colleen," said Pat, "yez can't have too much av a good thing, an' whin Oi'm dhrunk, an' look at yer purty face. Oi can see two or three av him, an' it's a timptation Oi can't resist!"

A letter was once received at the post-office in New Orleans directed to the biggest fool in that city.

The postmaster was absent, and on his return one of the young clerks informed him of the receipt of the letter.

"And what became of it?" inquired the postmaster.

"Why," replied the clerk, "I didn't know who the biggest fool in New Orleans was, so I opened it myself."

"And what did you find in it?" inquired the postmaster.

"Find?" replied the clerk. "Why, nothing but the words, 'Thou art the man.'"

It was the Sabbath Day, and the elder was shaving himself prior to church time, when he made a slight cut with the razor on the extreme end of his nose. Calling his wife, he asked her if she had any court plaster.

"You will find some in my sewing basket," she said.

The elder soon had the cut covered. At church, in assisting with the collection, he noticed every one smile as he passed the plate. Very much annoyed, he asked one of his assistants if there was anything wrong with his appearance.

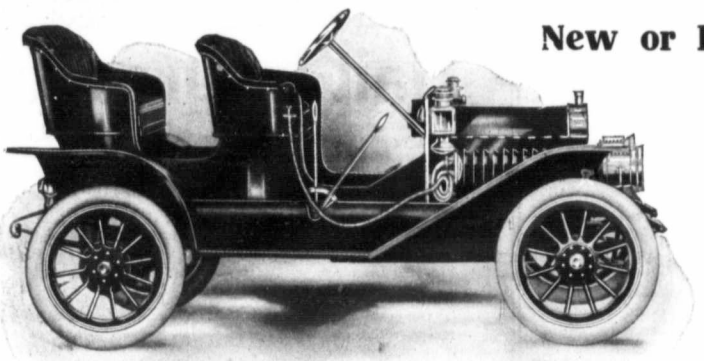
"I should say there was," answered the assistant. "What is that upon your nose?"

"Court plaster."

"No, said his friend; "it is the label from a spool of cotton. It says 'Warranted 200 yards.'"

There was a young lady in Tenn.,
Whose name was Sophronia Henn.
Growing old and infirmer,
She was oft heard to murmur:
"I wisht I had wan av thim Menn!"

FREE REWARDS



For sending in either

New or Renewal Subscriptions

FOR THE

Canadian Thresherman - - and Farmer - -

Besides the free rewards, every subscription includes three chances to win the automobile, for each subscription includes three estimates on the contest. If you send in two subscriptions, you get two rewards and seven chances on the automobile.

LOOK

$ 1	pays for	1	year's subscription,	1	premium	and	3 estimates
$ 2	" "	2	" "	2	"	"	7 "
$ 3	" "	3	" "	3	"	"	11 "
$ 4	" "	4	" "	4	"	"	15 "
$ 5	" "	5	" "	5	"	"	19 "
$ 6	" "	6	" "	6	"	"	23 "
$ 7	" "	7	" "	7	"	"	27 "
$ 8	" "	8	" "	8	"	"	31 "
$ 9	" "	9	" "	9	"	"	35 "
$10	" "	10	" "	10	"	"	40 "

Our Wheat Guessing Contest this year is on the number of kernels in twelve pounds of No. 2 Northern Wheat. To the person first guessing nearest to the number of kernels, we will give this McLaughlin Buick Automobile, valued at $1200.00. Each subscription includes three estimates; however, by subscribing for two or more years, or sending in additional subscriptions, you can secure extra estimates as shown in the table above.

THE AUTOMOBILE

will be delivered to the winner F. O. B. Winnipeg, all complete with oil tail lamp, oil side lamp, two gas head lights, generating horn, repair outfit, jack, and pump. This is the 1911 Model "G" Four Passenger "Tourabout" McLaughlin-Buick Automobile with detachable rear seat.

THE CONTEST started November 1st, 1910, and closes June 30th, 1911. The contest is open to everyone in Canada except residents of Winnipeg. To secure estimates, all you have to do is to send in either new or renewal subscriptions for the Canadian Thresherman and Farmer. This is the third year we have put on a wheat guessing contest, and the fair and square manner in which these have been conducted in the past, is sufficient guarantee that you will have the same chance as anyone else when putting in your estimates this year. In fact we guarantee to forfeit $2,000.00 to any charitable institution if anyone can prove that our Contest is not conducted in a fair and square manner.

THE WHEAT is a fair clean sample of No. 2 Northern and was procured from the Dominion Grain Inspector's Office, Winnipeg. The wheat and bottle were taken direct from the Grain Inspector's Office to the Dominion Weights & Measures Office, and exactly twelve pounds of the wheat was weighed out and poured into the bottle. The bottle was then immediately sealed up by the Ass't. Inspector of Weights & Measures in the presence of two witnesses. The bottle was then photographed and deposited with the National Trust Co. to remain in their vaults until the contest closes June 30th, 1911, 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.

THE SUBSCRIPTION PRICE of The Canadian Thresherman and Farmer is $1.00 a year in Canada and Great Britain, and $1.50 a year in the United States and Foreign Countries. All subscriptions are positively discontinued when they expire unless renewed. Extra subscription blanks, sample copies, etc. to assist you in forming a club, sent free on request.

One dollar pays for one year's subscription for The Canadian Thresherman & Farmer, includes three estimates on the wheat guessing contest and your choice of any one of the following books, which will be sent postpaid immediately on receipt of subscription. These books are printed in large clear type and put out in neat cloth binding.

Pilgrim's Progress, by Bunyan
Shirley, by C. Bronte
Tales, Poems and Sketches, by Bret Harte
Hypatia, by Kingsley
Essays, by Huxley
Handy Andy, by Samuel Lover
Voyages of Discovery, by Cook
Midshipman Easy, by Marryat
Heroes and Hero Worship and Essays on Goethe, by Carlyle
Masterman Ready, by Marryat
Our Village, by Mitford
Origin of Species, by Darwin
Three Midshipmen, by Kinston
Gulliver's Travels, by Swift
The Talisman, by Sir Walter Scott
Harold, by Bulwer Lytton
Plays, by Sheridan
Ravenshoe, by Henry Kingsley
Vanity Fair by Thackeray
Peter the Whaler, by Kinston
Wonder Book and Tanglewood Tales, by Hawthorne
Charles O'Malley, by Charles Lever
Historical Essays and Lays of Ancient Rome, by Macaulay
Wuthering Heights, by Bronte
Guy Mannering, by Scott
Hard Cash, by Charles Reade
Whitefriars, by Emma Robinson
Poems, by Whitman
Legends, by Proctor
Two Years Ago, by Kinsley
Heart of Midlothian, by Scott
Barchester Towers, by Trollope
Peter Simple, by Marryat
Treasure Island and Kidnapped by R. L. Stevenson
Sense and Sensibility, by Jane Austen
Bible in Spain, by Borrow
Adam Bede, by George Eliot
East Lynne, by Mrs. H. Wood
Essays of Elia, by Charles Lamb
Tale of Two Cities, by Charles Dickens
Ivanhoe, by Sir Walter Scott
Poems, 1830-1865, by Lord Tennyson
Westward Ho! by Chas. Kingsley
Sesame and Lilies, Unto this Last, and the Political Economy of Art, by John Ruskin
The Scarlet Letter, by Nathaniel Hawthorne
The Cloister and the Hearth, by Charles Reade
Christmas Books, by C. Dickens
Tom Brown's School Days, by Hughes
King Solomon's Mines, by H. Rider Haggard
Poems, 1833-1865 (Selected), by R. Browning
John Halifax Gentleman, by Miss Mulock
Essays, by Bacon
Mill on the Floss, by George Eliot
Autocrat of the Breakfast Table, by Holmes
Kenilworth, by Sir Walter Scott
Jane Eyre, by C. Bronte
Robinson Crusoe, by Defoe
Waverley, by Sir Walter Scott
Old Curiosity Shop, by Dickens
Essays (Selected), by Emerson
Cranford, by Mrs. Gaskell
Silas Marner, by George Eliot
Poems (Selected), by Longfellow
Last Days of Pompeii, by Lytton
Henry Esmond, by Thackeray
Tower of London, by Ainsworth
Life of Nelson, by Southey
Life of Christ, by Farrar
Faust, by Goethe
Last of the Mohicans, by Cooper
Opium Eater, by De Quincey
Shakespeare's Complete Works in 4 volumes
Barnaby Rudge, by Dickens
Last of the Barons, by Lytton
Fairy Tales (Selected), by Anderson
Vicar of Wakefield, by Goldsmith
The Deerslayer, by Cooper
Pride and Prejudice, by Austen
Poems (Selected), by Burns
Three Musketeers, by Dumas
The Channings, by Mrs. H. Wood
Ingoldsby Legends, by Barham
Oliver Twist, by Dickens
The Little Minister, by J. M. Barrie
Fairy Tales (Selected), by Grimm
Meditations, by Marcus Aurelius
Uncle Tom's Cabin, by Stowe
Selborne, by White
Two Paths and Other Essays, by Ruskin
The Pathfinder, by Cooper
Tales from Shakespeare, by Lamb
The Woman in White, by Wilkie Collins
Sartor Resartus and Essays on Burns and Scott, by Carlyle
It's Never Too Late to Mend, by Reade
Tales of Mystery and Imagination, by Poe
Swiss Family Robinson, by Wyss
The Complete Angler, by Walton
The Master of Ballantrae, by Stevenson
The Sketch Book, by Irving
Mansfield Park, by Austen
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The Black Tulip, by Dumas
The House of Seven Gables, by Hawthorne
Reminiscences of Scottish Life and Character, by Ramsay
Villette, by C. Bronte
The four Georges and the English Humorists of the Eighteenth Century, by Thackeray
The Seven Lamps of Architecture by Ruskin
Emma, by Austen
The Imitation of Christ, &c., by A Kempis
Hereward the Wake, by C. Kingsley
Table Talk, by Hazlitt
Twenty Thousand Leagues under the Sea, by Verne
Homer's Iliad, by Pope
A Journal of the Plague Year, by Defoe
The Professor at the Breakfast Table, by Holmes
Scenes of Clerical Life, by Eliot
Mrs. Beeton's Cookery Book.

Four dollars pays for four years' subscription for The Canadian Thresherman & Farmer or four-one year subscriptions, includes fifteen estimates on the wheat guessing contest and this "Daisy" single shot Air Rifle, which will be sent postpaid immediately on receipt of subscriptions. This Air Rifle shoots either BB shot or darts.

Two dollars pays for two years' subscription or two-one year subscriptions for The Canadian Thresherman & Farmer, including seven estimates on the wheat guessing contest and this pocket tool kit which will be sent postpaid immediately on receipt of subscriptions. This tool Kit when closed looks like an ordinary awl with plain wood handle, and nickelled shank; but inside the handle are ten tools including gimlet, tack puller, screw driver, awl, chisels, etc.—ten tools in one.

One dollar pays for one year's subscription for The Canadian Thresherman & Farmer, including three estimates on the wheat guessing contest and this "Awl-U-Want", which will be sent you immediately on receipt of subscription. This Awl-U-Want is for sewing leather quickly, mending harness, shoes, etc.

Six dollars pays for six years' subscription for The Canadian Thresherman & Farmer, including twenty-three estimates onthe wheat guessing contest and this Home Repairing Outfit, which will be sent immediately on receipt of the subscriptions

or

Three dollars will pay for two years' subscription for The Canadian Thresherman & Farmer, including seven estimates on the wheat guessing contest and this Home Repairing Outfit, which will be sent immediately on receipt of subscriptions.

The Home Repairing Outfit illustrated herewith is probably one of the most useful, compact, and convenient mending and repairing outfits ever put out. It consists of 4 lasts, 1 stand, 1 hammer, 3 awls, 1 knife, cement, bristles, thread, wax, 4 packages nails heel plates, needles, harness and saw clamps, rivets, punch, soldering iron, resin, and directions. Everything complete packed in box. Shipping weight 15 pounds. Not sent prepaid. When ordering be sure and give shipping instructions.

The Canadian Thresherman and Farmer, Winnipeg. K

Please find enclosed $.....for .....years' subscription for The Canadian Thresherman and Farmer to be sent to

NAME.....

ADDRESS.....

As per your special offer send me postpaid to the following address the.....and (Premium)
place to my credit the estimates on your wheat guessing contest

NAME.....

ADDRESS.....

My estimates as to the number of kernels in the 12 lbs. No. 2 Northern Wheat are .....

Send all subscriptions to E. H. HEATH CO., Limited., Publishers The Canadian Thresherman and Farmer, Winnipeg, Canada

We will forfeit $2,000.00 to any charitable institution if anyone can prove that our Wheat Guessing Contest is not conducted in a fair and square manner.

FIRST AID TO THE INJURED

Shock.—A person who has sustained a railroad accident, a severe burn, or even a sudden fright, often suffers from shock. The symptoms are feeble breathing, feeble pulse, pale face, cold skin and sometimes a delirious state of mind. The treatment is to place the patient in a horizontal position with the head slightly lowered. First, bind open wounds, then give from a teaspoonful to a tablespoonful of whiskey or some other stimulant in a tablespoonful of hot water, repeating the dose every ten minutes, until five or six doses have been taken. Put hot flannels on the chest, and hot water bottles or hot bricks along both sides of the body and under the armpits. Then cover the patient with a blanket to keep the heat in. The point of all this treatment is to thoroughly warm and stimulate the patient.

Wounds.—The principal object in treating a wound is to stop the flow of blood. First, apply something over the opening to prevent the escape of blood, and then close the artery somewhere between the heart and the point where the injury is situated. This can be done by means of a tourniquet, which is a bandage or rope placed around the arm or leg, and twisted by means of a stick until it is tight enough to compress the artery and stop the flow of blood. This is effective in the case of incised wounds.

Lacerated Wounds.—In cases where a wound has a ragged edge, and the skin about it is torn or bruised, cleanse the wound thoroughly in warm water, place a wet cloth over it and bandage lightly. Wounds of this kind are usually caused by railway and machinery accidents, by falling timber, stone, etc., and are accompanied by a shock which should be given the treatment mentioned under that head.

Bruises.—Lay over the bruise a cloth saturated with hot water, or with any of the household remedies that contain alcohol. Hot poultices will diminish the pain and hasten the absorption of the blood.

A Crushed Part.—In a case where the foot or hand is crushed, it should be put back as naturally as possible to its original shape, and then, unless it is bleeding profusely, wrapped in a cloth dipped in warm water, and the whole injury warmly wrapped in a blanket.

Lightning. — Dash ice-cold water over the patient, and get a doctor as quickly as possible.

Sunstroke.—Remove the patient into a cool place, elevate the head and apply ice water to it. Also apply mustard or turpentine to the calves of the legs or soles of the feet.

Fainting.—Place the patient flat on the back with the head lower than the rest of the body, give plenty of fresh air and sprinkle with water.

Burns and Scalds.—Apply immediately either vaseline, linseed, olive, or castor oil, white lead, soap, whitewash, or molasses.

Sprained Ankle or Wrist.—The essential treatment in this case is to apply a cold application of some kind. Some people advocate pouring cold water from a height on the injured member. After the swelling has decreased it may be rubbed with alcohol or salt water.

Mad Dog, Snake, or Reptile Bites.—Bind a cord tightly above the wound; suck the wound out, and sear or cauterize the injury immediately with a white hot iron or with caustic. Give stimulants such as whiskey or brandy. The object of this treatment is to prevent the spreading of the poison through the system.

Gun Shot Injuries.—A bandage should be applied tightly above the wound to stop the bleeding, foreign matter removed, and the wound washed.

Nosebleed.—Nosebleed may be stopped by plugging up the nostrils with lint, and by making cold applications to the back of the neck. In some cases nosebleeds may be checked by cobwebs or by placing a piece of brown paper under the upper lip.

Internal Bleeding.—Keep the patient at perfect rest. Give small pieces of ice to swallow.

Fracture of Limb. Place the injured member on a pillow and lay a wet cloth cloth on the fractures, sprinkling it with cold water. Avoid unnecessary moving. If the patient must be moved, draw the bone into as natural a position as posible by placing one hand above and the other below the fracture, and pulling steadily. Then take two pieces of thin board, somewhat longer than the injured bone, and as wide as the limb is thick, and fold up pieces of cotton batting or soft cloth for a pad. Tie the splints firmly one on each side of the injured member, using for this purpose strips of cloth, the object of this being to keep the broken ends of the bone immovable.

Other Fractures.—In case of fractures of the jaw, skull, etc., place the patient in a cool, dark, quiet place, keeping the head slightly raised and placing a wet cloth on it. Stimulants should not be given.

Suffocation.—Dash cold water in the face, slap the patient on the breast, and hold ammonia under the nostrils. If these simple means do not restore breathing, it will be necessary to resort to artificial respiration, which is discussed under drowning.

Dislocation.—The best general treatment for dislocations of all kinds is to make the patient as comfortable as possible and lay a wet cloth over the affected joint until skilled aid can be obtained.

Treatment for Drowning.—Never take it for granted that a person taken from the water is dead, until the treatment recommended to restore a drowning person has been tried to the limit. Cases are on record where persons have been under the water half an hour, and have been brought back to life. If the patient's face is swollen and purple, with the lips livid and the eyes bloodshot, or if, on the other hand, he appears pale and flabby, it is no evidence that he is dead. The treatment should be given immediately and on the spot, except in extreme weather, when the body may be removed to a place of shelter if it is near.

The first object of the treatment is to make the patient breathe, and after this is accomplished, to re-establish the circulation of the blood, and to restore warmth to the body. First, send immediately for a doctor, blankets and stimulants. Expose the chest and shoulders to the wind; quickly open the clothing about the neck; turn the patient on the face; clasp your hands together beneath the stomach, and lift as high as possible, allowing the head to hang so that the water can run out. Hold the patient in this position for a few seconds, and then turn him again on his back. Wipe out the mouth and the back of the throat with your finger covered with a handkerchief.

If this does not restore breathing, apply smelling salts to the nose, tickle the nose with a feather, or straw, and dash water on the chest, alternately hot and cold. These methods must be quickly tried, and if they are not successful, artificial respiration must be resorted to. The best method known is Sylvester's method. The point is to make the chest expand, causing the air to be drawn in just as a pair of bellows will fill with air when open. Then the chest is made to contract and the air forced out. By alternately performing these two movements, we have inspiration and expiration, and the two together constitute respiration. The patient should be placed on the back with the shoulders resting on a roll of clothing, and the tip of the tongue drawn forward out of the mouth, otherwise it will fall back into the throat and will interfere with breathing. This is very important, and should be done by grasping the tongue with a dry handkerchief, or the fingers may even be covered with sand to prevent the tongue from slipping. If alone, one would have to draw the tongue out and tie it against the lower teeth. The best way to hold the tongue out is to run a pin or needle through it, which will prevent it from falling back. Then, after adjusting the tongue, kneel behind the patient's head, grasp him by the forearms, and draw up his arms over his head quickly but steadily until his hands touch the ground behind his head. Hold them there for two seconds, then reverse the first movement by carrying the arms back again until they rest against the sides of the chest—the forearms being thrust firmly downward and inward against the chest for one second. Continue this regularly and persistently at the rate of sixteen times per minute, until some effort is made by the patient to breathe, when you should endeavor to time these movements by his efforts. At such a time ammonia may be applied, as well as dashes of cold water and slapping. Even if there is no sign of life, this artificial respiration should be continued for an hour and a half at least. If this is properly done, the air can be heard entering and leaving the chest. During the attempt to restore respiration, the body should be kept warm. This may be done by friction of all kinds, as well as by hot water bottles and hot bricks. As soon as the patient can swallow, give hot drinks. If difficulty of breathing persists, apply a hot mustard plaster to the chest.

Choking.—In cases where some foreign substance has gotten into the throat, and the patient turns purple in the face, the eyes protrude, the arms are thrown about, and sometimes the patient falls unconscious, the first thing to do is to slap him violently on the back. Stand him up, face to the wall, with his chest resting against it, and give him a severe blow between the shoulders. In the case of a child, place one hand on each side of the chest, and compress it vigorously and constantly, or lift it up by the heels and slap the back while in the position. Sometimes the foreign substance can be grasped by thrusting the thumb and forefinger down the throat.

Lanterns in the Barn.

It is estimated that nine-tenths of all fires are caused by carelessness. Never light a lamp or lantern of any kind in a barn. Smokers may include their pipes and cigars in the above. The lanterns should be lighted in the house or some outbuilding, where no combustibles are stored. A lantern, which does not burn well, should never be put in order in the hay mow. There is a great temptation to strike a match and relight an extinguished lantern, wherever it may be. It is best to even feel one's way out to a safe place than to run any risks. If the light is not kept in the hand, it should be hung up. Provide hooks in the various rooms where the lights are used. A wire running the whole length of the horse stable, at the rear of the stalls, and furnished with a sliding hook, is very convenient for night work with the horses.

THE STORY OF THE

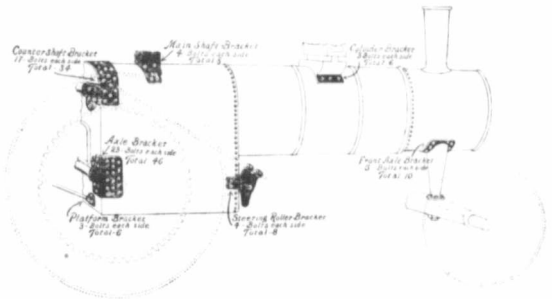
Wonderful Avery Undermounted Engine

Seven Years of Success and Hundreds of Users. Many more Buy Them Every Year.

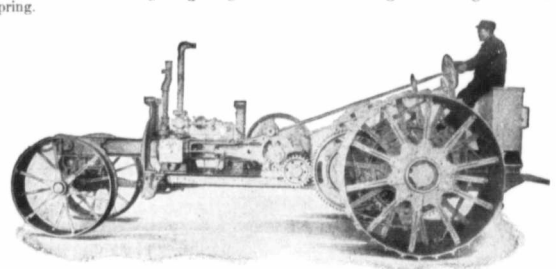
The Main Points of Advantage Fully Explained by Illustrations and Description.

Why an Avery Undermounted Engine is more Durable.

In the construction of Top-mounted Engines the Cylinders, Gearing, Ground Wheels and other parts are all bolted to the boiler by means of brackets. The boiler shell serves as the main framework of the Engine, and must bear all the severe pulling and twisting strains of traction work. Ordinary boiler shells are only ¼ or 5-16 of an inch in thickness and in exceptional cases ½ inch, and think of it—a thin shell like this having to carry all the weight of the brackets, gearing, cylinders, etc., and having to stand all the pulling strains.

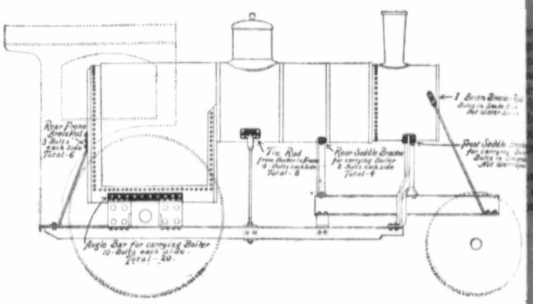


When you think of this it is easy to see why Top-mounted Engines are not durable for heavy traction work. Every experienced traction engine operator who has used a top-mounted engine for any kind of heavy traction work knows what the results are, for these strains on the boiler cause all kinds of trouble in the way of leaky cap screws, loose brackets, etc., while in some cases the strains are so great as to even bulge the boiler itself, drawing the gearing out of line and causing the shafting to bind and spring.



But with an Avery Undermounted Engine **you get rid of all these troubles.** It is much more durable because the boiler is entirely free from all pulling strains. The entire working parts—cylinders, gearing, ground wheels, etc.—are all mounted on an independent angle steel frame work. The cylinders are bolted to the steel frame—not the boiler. The gearing and ground wheels are all fastened to the steel frame—not the boiler. The load is all pulled by the steel frame—not the boiler. There are no pulling strains whatever on the boiler—the steel framework takes them all.

In building a Top-mounted Engine, the first thing you do is to begin boring holes in the boiler to attach the brackets. In an Avery Undermounted Engine, you build up the truck all complete, and then simply set the boiler on it and bore enough holes in it to fasten it on and hold it in position. The boiler carries no weight and pulls no load.



The line drawings of the Top-mounted Engine and the Avery Undermounted Engine on this page show clearly why an Avery Undermounted Engine is much more durable than the Top-mounted style. In this Top-mounted Boiler there are 108 holes bored in the water space for attaching the brackets. In the Avery Undermounted Engine there are only 18 holes bored in the water space in the open bottom boilers and 38 in the closed bottom boilers. Only 1-6 as many bolts in the open bottom style and about 1-3 as many in the water bottom style, and these bolts in an Undermounted Engine Boiler have practically no strains to bear, while in a Top-mounted Engine they have to pull all the load and hold the Engine together.

To emphasize stronger what this all means to you when you buy an Avery Undermounted Engine, we give every purchaser a special warranty against leaky brackets which is printed right in our order blank. This warranty reads as follows;

SPECIAL AVERY WARRANTY AGAINST LEAKY BRACKETS

All Avery Undermounted Engines are warranted for one year or LONGER against leaky cap screws attaching any brackets to the boiler, and any defects of such nature will be made good free of charge.

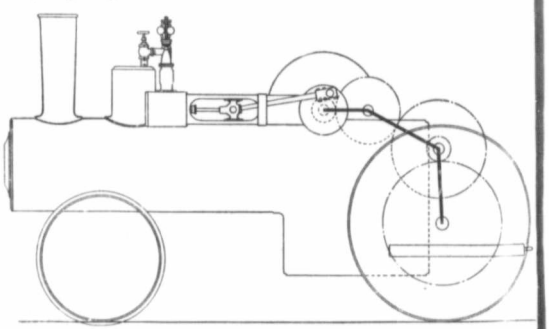
Notice that this says one year or LONGER. There is no time limit to this warranty, and it covers one of the worst troubles owners have with Top-mounted Engines. Where can you get any such a warranty as this on any Top-mounted Engine?

It is surely plain to see from all this that an Avery Double Undermounted Engine with its independent boiler has a construction that will last much longer and stand in better shape under heavy pulling strains than a Boiler-mounted, Bracket-up Engine. This is a point that you could consider strongly in buying an engine. The engine that is cheapest for you to buy, is the one that will stand up under the work and keep at it day after day and last the longest.

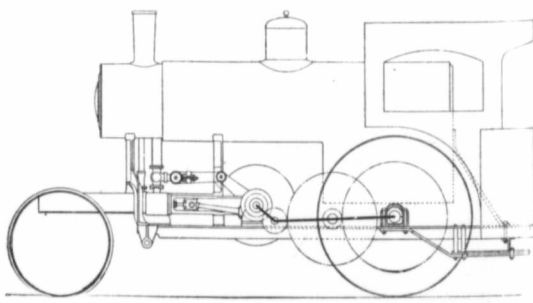
Why an Avery Undermounted Engine is More Powerful.

There are three principal reasons why an Avery Undermounted Engine is More Powerful on the draw-bar pull.

The **first reason** is that with the Avery Undermounted Engine, the load is distributed better proportionately on the front and rear wheels and there is no rearing or jumping up of the front wheels as often happens with Top-mounted Engines when pulling heavy loads.



The **second reason** is found in the fact that the pull of the cylinders through the gearing and back to the load is in a straight line instead of down from the top of the boiler at an angle as with Top-mounted Engines.



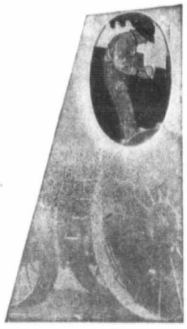
This is clearly shown by the two drawings here and is one of the most important reasons why an Avery Undermounted Engine is more powerful on the draw-bar pull

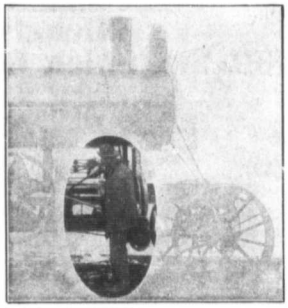
The **Third Reason** why an Avery Undermounted Engine is more powerful is because it has two cylinders, is equipped with balance valves and has a specially designed curved block valve gear. With the double cylinders you never have any dead centers, you can start a load much easier and with less jerking on the engine and the belt, and get a steadier pull and more power. The balance valves save steam, relieve the valve gear of much of the strain required to move the ordinary slide valves, and help to increase the power of the engine and reduce the amount of the fuel, water and heating oil required. The Avery valve gear gives an equal lead and cut off at all points with the reverse thrown clear over or hooked up, and whether the engines are running in one direction or the other.

When you buy an Engine what you want is power. Power for belt driving and power for pulling. We cannot make this point too strong about the wonderful power of an Avery Undermounted Engine. Remember this, that you get more power when you buy an Avery Undermounted Engine than with any other engine built.

Why an Avery Undermounted Engine is Easier to Handle.

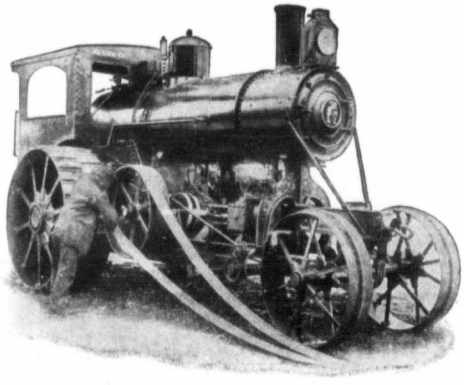
The illustrations here show better than words why an Avery Undermounted Engine is easier to handle.



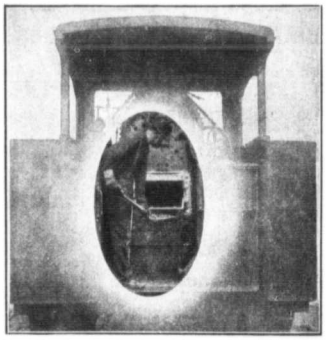


The two illustrations above show how you have to climb up on top of the boiler to oil or adjust a Top-mounted Engine, while on an Avery Undermounted Engine you can reach all the working parts while standing on the ground.

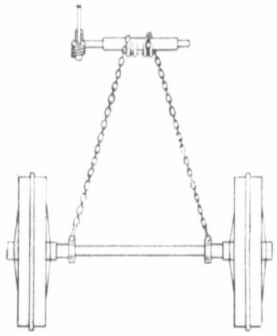
The illustration here shows three men belting up a Top-mounted Engine. One man is up on top of the drive wheel and the two men on the ground are lifting up the belt.



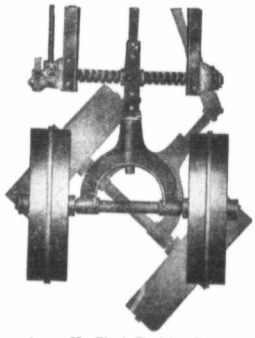
With an Avery Undermounted Engine, one man alone can stand on the ground and put on the drive belt and do it easier and quicker than two or three men can put the belt on the fly-wheel of a Top-mounted Engine.



These illustrations show how you fire a Top-mounted Engine and an Avery Undermounted Engine. In one, the fire door is down close to the platform and you have to lean over and bend almost double to throw in the coal. With the Avery Undermounted Engine you can stand almost straight up to do the firing.



Ordinary Slack Loose Chain Steering Device



Avery No-Slack Positive Screw Shaft Steering Device

These illustrations show the style of the ordinary loose chain guide and the Avery Screw Shaft Steering device. In the chain style it is necessary for the chains to be loose, and each time you turn the steering wheel from one way to the other, you have to take up the slack in the chain. The wheels continually jerk backwards and forwards and the engineer is kept busy keeping his engine in line.

In the Avery Undermounted Engine, we use a Screw Shaft in place of chains. There is no slackness at all in this steering device. When you begin to turn the steering wheel, the front wheels also begin to turn immediately. There is much less turning of the steering wheel required. The slackness of the ordinary chain guide is entirely done away with, steering made much easier and more positive and the wheels move ahead directly in line where they are set. The arrangement of the gears is also such that you can turn the front wheels much more easily than with the chain style. This is a particularly valuable feature for plowing, grading or hauling purposes.

The Avery screw shaft guide is the finest thing in the way of a guide that was ever put on an engine.

The Avery Screw Shaft Guide Makes this Possible.

Consider all of these things—being able to get at the working parts while standing on the ground for oiling and adjusting and not having to climb around over a hot boiler; the fly-wheel low down so that one man can belt up the engine and stand on the ground to do it; the convenient location of the fire door which makes it much easier to fire; and the positive, easy working, screw shaft, slackless steering device—when you consider all these things, you will easily understand why an Avery Undermounted Engine is much easier to handle than other Engines.

You ought to find out all about the Avery Undermounted Engine—the Engine that's built like a Railroad Locomotive—the Engine that's More Durable, More Powerful and Easier to Handle.

Write for Free Copy of our New 1911 Avery Engine, Separator and Plow Catalog and find out all about it. Address

Avery Company, 675 Iowa St., Peoria, Ill., U.S.A.

Haug Brothers and Nellermoe Co., Ltd.

CANADIAN JOBBERS, WINNIPEG, MANITOBA

Automobiles for the Farmer

By A. C. EMMETT.

The old adage, "Time is Money," was never more truly exemplified than in the case of the farmer. This is especially so at certain seasons of the year, when every minute of a long day is of the greatest value, in the plowing of the land, seeding tending and final harvesting of the crop. Anything that will save time is then a factor of the greatest importance, and demands the immediate attention of the agriculturist. Nothing in the list of modern inventions has such an effect on the time question as the automobile, and hundreds of farmers have already realized this, and made a good general utility car part of the farm equipment. This provides them with an insurance against lost time that is of the greatest value, as not only does it provide a ready means of intercommunication between the farm and the town for the ordinary, everyday business, but in the event of a serious breakdown in the farm machinery, providing the means of obtaining the necessary repairs in the shortest possible time, and preventing serious loss by the standing idle of many men, should the accident occur when the harvesting or threshing is in full progress.

Manufacturers' Campaign.

Many manufacturers have waged a special campaign amongst the farming communities during 1910, and have gained many valuable points in regard to what a farmer expects in a car. The chief feature of the farmer's requirements appears to be a touring car with a detachable tonneau, and many of the firms who pinned their faith to a runabout as being the most likely class of car to meet the needs of the agricultural community, have been compelled to remodel the bodies of a great many of the cars built, in order to provide a car with seating capacity for five people.

What is Needed.

What appears to be needed is a car of a general utility type. It cannot be expected that a farmer who uses the automobile for a pleasure trip to town, will go back to the horse-drawn democrat when necessity compels him to go to town for business purposes. To meet the case, the manufacturer should build a combination body for the car which would allow of it being used for either business or pleasure purposes. This should be along the lines of a demountable tonneau, allowing for the substitution of a light carrying platform, or an express van style of body. These extra bodies could be sold at a nominal extra cost, sufficient to cover the cost of construction and fitting, and their provision would undoubtedly have a beneficial effect on the sale of cars to farmers, and increase the value of the machine a hundred per cent.

The farmer, when purchasing a car, looks upon the advantages to be obtained from its use, and if he sees that the car can be utilized in the manner suggested, then he is much more likely to purchase the car offering him these advantages. There is an extraordinary field for the use of the automobile in the lighter work of the farm, and many of these uses have been developed by the farmers themselves. A few instances of the use to which a car can be put may be gathered from the various schemes already in operation. One farmer has added a large crate which takes the place of the ordinary tonneau, and uses it for the purpose of carrying live stock, such as sheep, pigs, and calves, whilst another uses the car for the grinding of feed, sawing logs, etc., whilst a travelling salesman has added a two-wheeled trailer, on which he carries the heavier samples of his merchandise. This activity shows the great field still open for the automobile, and it is up to the manufacturer to develop this field by providing for the needs of the prospective users.

Many farmers, when taking up the question of an automobile, raise the point as to the difference between one, two, and four cylinder cars, and are sometimes at a loss to understand the difference in the cost of construction between the various styles.

In order to show the difference between them, the following simple explanation may prove of service.

One Cylinder—5.

In the one cylinder type, the power stroke only occurs once in every four revolutions, the action being as follows: first, suction or intake stroke; or the pulling in of a charge of gas through the inlet valve. Second, the compression stroke, or the movement of the piston upwards until the charge is compressed into the smallest possible space. Third, the firing of charge. The action bringing the electrical points into contact, and producing a spark between the points of the spark plug, which is so placed in the cylinder as to cause the flame, brought about by the closing of the electric circuit, in the centre of the compressed charge. Fourth, the scavenging stroke. The exhaust valve opens and the burnt gases are discharged through the exhaust pipe into the muffler, after which the cycle of operations is again taken up in the order named.

The Two Cylinder—5.

Wtih the two cylinder engine, the power stroke occurs once in every two revolutions, one cylinder taking up the compression stroke just as the first completes the compression.

Four Cylinder—5.

With the two cylinder engine, the cycle of operations is so arranged that a power stroke is obtained at every revolution, thereby giving a steady drive without the chugging so noticeable in the one and two cylinder styles, and preventing, to a great extent the stalling of the engine by any extra load that may be put upon it in pulling through a heavy spot.

It must not be assumed from this, that a one or two cylinder car is not capable of doing good work, but they will not give the same flexibility in running, or speed, that it is possible to obtain with the four cylinder car.

Questions in regard to any point in the working of the automobile, will be gladly answered, if the question is clearly asked so that it can be understood what is required.

The J. I. Case Threshing Machine Company, of Racine, Wisconsin, have entered two Case cars in the 2,300-mile Reliability Run conducted by the Modern Power Publishing Company, of Winnipeg, Man.

This tour covers the three provinces of Manitoba, Saskatchewan and Alberta. The cars leave Winnipeg about the first of August and proceed west from Brandon one hundred and thirty-three miles, then north-west to Saskatoon; from there almost due west to Edmonton, the capital of Alberta. From Edmonton the tour proceeds south to Calgary and then back east through Regina, the capital of Saskatchewan, and then back to Winnipeg. This tour will last about two weeks.

The Case drivers will be Lewis Strang and Will L. Jones, Jr., both of whom were in the Chicago Reliability run with Case cars.

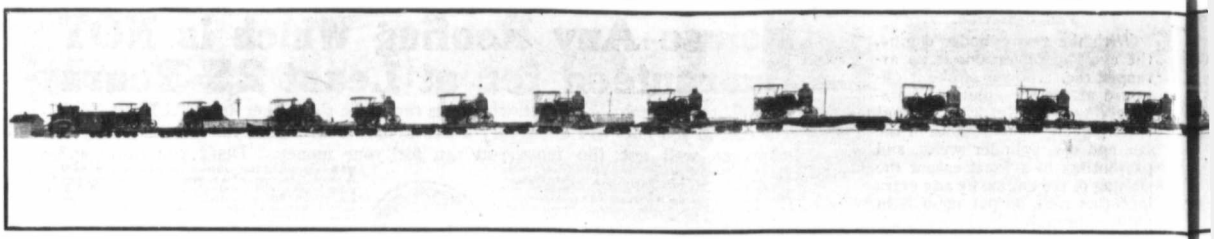
A Good Thing Investigated

On another page of this issue will be found the Cuddy Steering Device. We have seen this apparatus work and were surprised at its efficiency.

As it is made at the present it is designed for the smaller gasoline traction engines and it fills the bill. It will steer these engines in any kind of soil, or over any kind of land no matter how rough it is, and at the same time it is very compact, projecting no more than about five feet ahead of the engine. This enables the engine to turn in practically the same space that it could turn without the steering device.

A great many of these steering devices will be placed on engines this spring and if you are the owner of an engine, or contemplating buying one, we believe it would be well worth your while to investigate this machine.

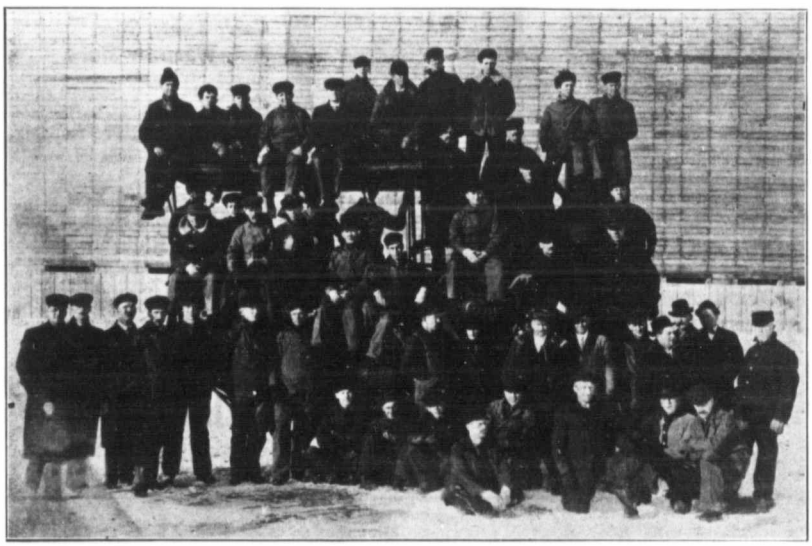
Address the Cuddy Implement Company, Winnipeg, mentioning this magazine.



THE RUMELY OIL PULL SCHOOL

The theory that an unskilled engineer can take hold of a gas tractor and run it successfully has been exploded. There was a time when this idea was prevalent, but field practice has demonstrated that the man who successfully operates a gas tractor must have a certain amount of knowledge of the machine he is operating.

In accordance with this the M. Rumely Company have opened at Regina a School of Instruction on Rumely Oil Pull engines. This School will be divided into three terms, beginning February 20th and ending April first. The School opened on February 20th with forty-five students in attendance. All of these men have purchased Rumely Oil Pull tractors. In fact the first two terms of the School will be devoted to Oil Pull owners only.



The third term which begins March 20th and extends to April first will be open to anyone interested in gasoline engineering. No fees are charged, each student, however, paying his own expense.

A complete staff of experts is on hand to take the students through the various lessons. The idea is to make it a School of practice and not one of theory; to teach through the eye and the hand rather than through the ear.

The M. Rumely Company issued a circular letter, which perhaps best explains the work of the School. We accordingly reproduce it here in detail.

"The proposed is the plan for the conducting of Oil Pull School at M. Rumely Company's warehouse, Regina, Sask., for the purpose of instructing operators in the operation and upkeep of the Rumely Tractor, viz.:—

"Each owner or purchaser of an Oil Pull Tractor shall be entitled to enroll one applicant for one term of the school. Three terms of school will be carried on:

First term: February 20th to March 4th.

Second term: March 6th to March 18th.

"Third term: March 20th to April 1st.

The first two terms will be open to owners and operators of Rumely Oil Pull Tractors, who have purchased engines to date, delivered or to be delivered. The third term will be open to everyone interested in Internal Combustion Engines, the only restriction being that each applicant must obtain the approval of some one of our local agents.

"The instruction will be entirely gratis as a courtesy from M. Rumely Company. Each applicant, of course, will be required to pay his own board and transportation expenses. Good board and room can be obtained at from $5.00 to $10.00 per week. Boarding places have been located and a list of same can be obtained at the Rumely Company's office.

"A room in the warehouse, 22' x [illegible], has been closed in and steam heated. The room will be well lighted and in the evenings the students can carry on any experimental work that they may see fit. The school will be under the control of a chief expert and four or more assistant experts, all of whom have had practical shop and field experience in the handling and operating of our Tractors, as well as a previous theoretical and mechanical experience with Internal Combustion Engines. Two engines will be located in this room, one a "B" Tractor, 25 draw bar horse power, 45 brake horse power, and the other an "E" Tractor, 30 draw bar horse power, 60 brake horse power. Around each Tractor we will have built a solid and substantial platform, which will enable the students to thoroughly examine all of the working parts in the best manner. It is proposed to do all of the demonstration and practical explaining with these two Tractors. The "B" Tractor will be operated on one cylinder, the other cylinder being exposed showing the valve and piston action, as well as camshaft action, etc., only one-half of the top of crankcase being removed. Both engines will be blocked up so that the transmission control can be thoroughly exploited and explained.

"The following days will be devoted to a plain, practical explanation of the machine in general, hours of school 9 a. m. to 12 a. m. and 2 p. m. to 5 p. m.:—

FIRST WEEK OF EACH TERM

MONDAY: Organizing Class.

TUESDAY: This day will be devoted entirely to a thorough study of combustion and the elements of combustion that enter into the practical workings of the Rumely Oil Pull, as well as practical demonstrations of the starting of the engine from a standpoint of combustion, gasoline, kerosene and water, Demonstrations will be made showing the effect of:—

Too much gas in starting, too little gas in starting;

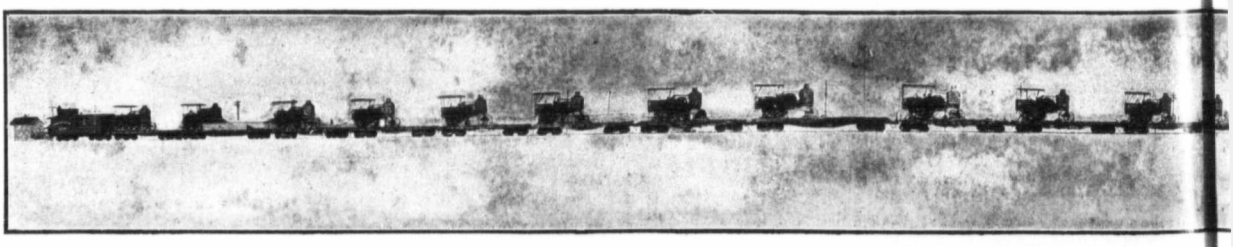
Too much kerosene, too little kerosene;

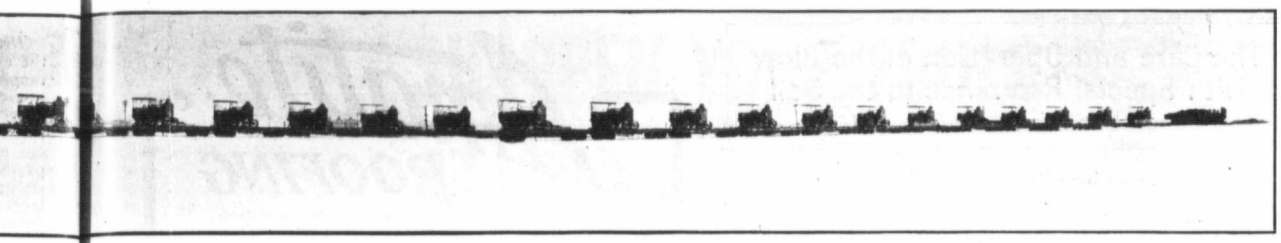
Too much water, too little water;

and other combustion troubles that an operator may experience in the field. In this day's study the question of heat as related to power will be explained and the purpose for which water is used in conjunction with kerosene. A further explanation will be made of the underlying principles of the Rumely carburetor and its control of the speed and the power of the motor.

WEDNESDAY: This day will be devoted entirely to ignition, and a thorough study of the ignition apparatus and the ignition devices with which the engine is equipped, as well as practical demonstrations of the part that the ignition apparatus plays in the starting and operation of the engine. A thorough explanation and practical examples of ignition troubles will be given, tracing of short circuits, effect of weak and dead batteries, dirty magneto, dirty spark plugs, etc., etc.

THURSDAY: This day will be devoted entirely to lubrication and cooling, and all the allied effects thereof with an explanation and practical demonstration of the lubrication and cooling troubles that an operator might ordinarily expect to experience through faulty engineering.





Friday: This day will be devoted to a thorough study of valve setting and timing, governor construction and timing, removing of valves and grinding, removal of pistons and changing cylinder rings, and an explanation and demonstration of the ordinary troubles that might be experienced in the field.

SATURDAY: This day will be devoted to a general study of bearings and all mechanical parts not heretofore touched upon, including transmission, etc., with practical demonstrations fitting bearings and the mechanical effects of tight bearings.

Second Week of Each Term

MONDAY: This day will be devoted to road work and combustion troubles.

TUESDAY: This day will be devoted to road work and ignition troubles.

WEDNESDAY: This day will be devoted to lubrication and cooling troubles.

THURSDAY: This day will be devoted to road work, valve setting and timing troubles.

FRIDAY: This day will be devoted to road work, bearing and mechanical troubles.

SATURDAY: This day will be devoted to a lecture on plowing conditions, hauling binders, drags, drills, and discs. threshing, etc.

It is intended that the first five days of the second week shall be a practical review of all of the information theoretically outlined and explained the first week.

The class will be divided into plowing crews and each crew will be given an engine and the various mechanical troubles explained and previously outlined will be worked out; for example, the timing of the engine will be changed and the engineer and his assistant will be obliged to start the engine and locate the trouble."

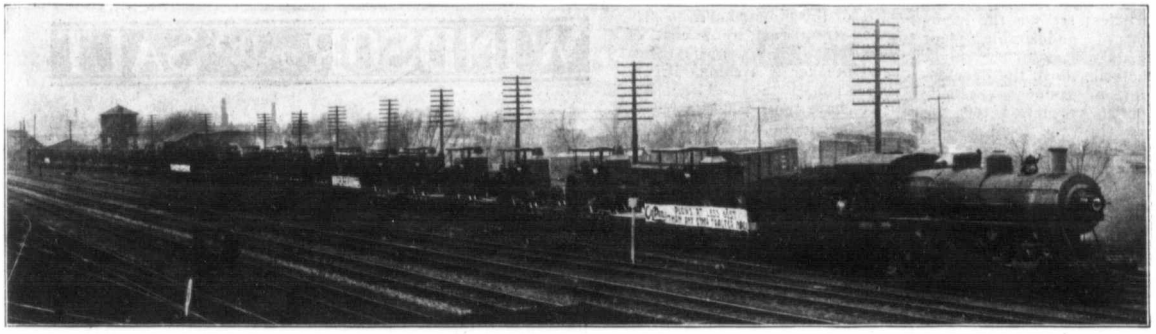
The M. Rumely Company are to be congratulated on their enterprise in carrying out such a laudable piece of work. They are not only initiating men into the workings of the Oil Pull engine but at the same time they are thoroughly acquainting them with the workings of the gas engine as a whole.

We need more of this sort of thing. The gas engine is becoming a powerful factor in Western Canadian agriculture. It costs money and is moreover a machine that requires care and skill in handling. We hear much in this day and generation about conservation of natural resources. It is about time that someone began to talk about conservation of farm machinery. Many a gas tractor, powerful, efficient, well designed and constructed has gone to the scrap heap through improper handling. Such schools as the above will do much to remedy this. It is to be hoped that more will be held.

The M. Rumely Company wishes to emphasize the fact that the last term of the School, beginning on March 20th, will be open to anyone interested in gas engineering and that each and every one whether he own an Oil Pull or some other make of engine, will be given the same consideration.

For further information write The M. Rumely Company, Regina. We believe it will help you if you mention this magazine.

TRACTORS BY THE TRAIN LOAD



The illustrations at the top and bottom of these pages represent a train-load of Rumely Oil Pull tractors bound for Western Canada. The photograph from which these illustrations were made was taken just west of Winnipeg.

The value of this train-load of machines is approximately one hundred thousand dollars and is of considerable importance viewed from the standpoint of Western Canadian agriculture.

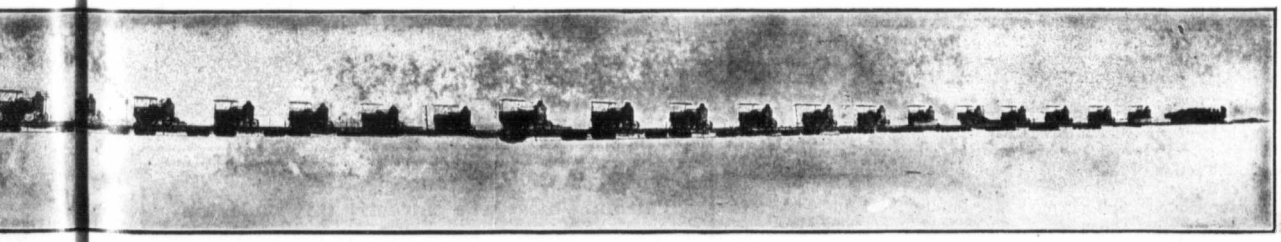
Every one of these engines should be capable of turning over sufficient land in one season to produce twenty thousand bushels of wheat and with wheat at approximately $1.00 per bushel, you can figure it out for yourself.

Leaving the matter of the amount of business that comes to the M. Rumely Company through this train-load of tractors out of the question, consider for a minute the importance and the value of this train-load of power machinery to Western Canada. We have land here in abundance—land that has lain sod locked for centuries. The world is crying for bread and if we were to depend upon the horse or the ox to put this same land under cultivation hordes would starve before wheat could be gotten to them.

Each one of these machines will do the work of at least seven men and thirty horses and when we consider that there is in Western Canada at the present time a decided scarcity of men, likewise horses, each of these machines is to be regarded as something more than a mass of iron and steel.

Three more such train-loads as the above are enroute from LaPorte, Ind. and others are still to follow. All these machines have been sold in Western Canada and will be put into operation in the spring of 1911 for the purpose of plowing, discing, harrowing, seeding, harvesting, threshing, etc.

Another illustration on these pages shows a train-load as it left La Porte, Ind. on February 16th arriving in Winnipeg on the morning of the 19th, which is record time, considering the distance as well as the fact that it came through in the winter season when freight traffic must of necessity be slow.



The Care and Operation of the Plow with Special Reference to the Soil

By L. SHANKS.

Tillage is one of the oldest occupations of man, it being recorded that Cain's vocation was tilling the fields. Yet until recent years, that most important tillage implement, the plow, remained in as crude a form as could be imagined.

The earliest plows were simply curved sticks drawn by men or oxen. About 1100, B.C., we have the first mention of plows clad with iron, those of that date having the point covered with an iron plate. This class of plow existed in somewhat modified forms for centuries, the Dutch plows of 1730, A.D., being the first in which any form of a moldboard is found. Soon after this the first iron plow was made and since then the development of the plow has been exceedingly rapid until at the present day we have plows suited for every kind and condition of soil.

The plow, as has been said before, is the primary implement in tillage. The objects of tilling the soil vary somewhat with its nature, but may be stated generally as—first, the pulverizing of the soil particles; second, the incorporation of undesirable plant growth and other surface refuse with the soil; third, the development of a proper seedbed; and fourth regulation of the moisture in the soil. The pulverization of the soil particles is accomplished chiefly by the shape of the moldboard of the plow and this is seen in the effect of different shaped moldboards. The long sloping moldboard of the breaker pulverizes the soil very slightly while the stubble plow with its short high moldboard turns the furrow-slice over breaking it into many pieces, their size depending, of course, on the kind and condition of the soil. The incorporation of weeds and refuse too is accomplished by the moldboard of the plow. The furrow slice once cut, it depends entirely on the form of the moldboard as to how effectually this is done. The development of a good seed bed depends more on the condition of the soil when plowed than upon any action of the plow. It, however, does assist by pulverizing and compacting the soil. The regulation of the soil moisture is accomplished by various implements as well as the plow which is, however, of primary importance. Until the soil has been loosened and turned over the other implements cannot do their best work; especially in soils that are wet does the plow aid in regulating the soil moisture. These are much improved by being plowed up and left exposed to the action of the weather without harrowing, as in this way the moisture-content will be considerably reduced. When soils are too dry, deep plowing and sub-soil plowing will assist in setting up capillary action but in this case the plow should be immediately followed by the harrow to prevent the escape of the capillary water by evaporation.

Plows are of three main types: the sod, stubble, and sub-soil plow. The sod plow or breaker is usually a single bottom hand plow, although at the present time plows with several bottoms are being used for breaking. The sod plow has a long, narrow and slightly curved moldboard and a very sloping share. The aim of this form of plow is simply to cut and turn a furrow without pulverizing the soil. These plows require less in the way of care than any other kind, as no difficulty is ever experienced in the matter of scouring, unless the plow has been grossly neglected. The chief point to remember in caring for these plows is to keep the share and whatever form of coulter is used in proper form, as a dull share or coulter add much to the draft and subtracts from the efficiency of the work done. When not in use all the bright polished parts of the plow should be protected from rust by a coat of thick oil. The operation of a hand breaker is a comparatively simple matter, the chief point being to have the hitch adjusted so that the plow will follow the team and throw its furrow properly without any undue effort on the part of the plowman. The proper arrangement of the hitch is most conveniently determined by experiment and all breaking plows should be fitted with a gauge wheel and a bridle, which are capable of adjustment to varying conditions.

Stubble plows have more common forms than either sod or subsoil plows, the simplest form being similar to a hand breaker in most respects. Stubble plows usually have a steel beam and their bottoms differ materially from those of sod plows. But, except in the matter of scouring, the care and operation of a hand stubble plow is very similar to that of a breaker. The question of scouring in plows is a wide one and one most aggravating to the plowman whose plow refuses to "clean." The scouring of a plow bottom is dependent upon several factors. The first is the material of which the scouring parts are made; some moldboards being made of steel, others of chilled iron and still others of soft centre steel. For western conditions the soft centre steel has been found the most satisfactory, as it has the following advantages: It has a cast steel surface of fine texture which is capable of a high polish; it has a soft centre which gives strength to the hard cast steel; and it forms a combination of the qualities of the other two ma-

terials. The share and landside of the best plows are also made of soft centre steel. The second factor affecting the scouring of plows is the shape and height of the moldboard, the shape of the share and the height of the landside. A moldboard with too great a curvature for the nature of the soil will refuse to clean, the soil lodging in the hollow of the board. If the board is too high the upper part will not be scoured by the soil and this unscoured part will hold the soil and prevent still more of the moldboard from scouring. If, however, the board is too low, trouble will result from the soil falling over the back of the board and also the furrow will not be so well turned. In this matter, however, I believe it is better to err on the side of the low moldboard, as it gives the least trouble. This, however, is only relative, depending also on the width and depth of furrow turned. Shares which are not properly designed or resharpened or which do not fit smoothly with the moldboard are a frequent cause of trouble in respect to scouring and a high landside is governed by the same conditions mentioned with regard to high moldboards. The third and most uncontrollable factor affecting the scouring of plows is the nature and condition of the soil. It is my experience that a plow in good condition which was perfectly satisfactory in regard to scouring in spring or fall-plowing, will fail to clean in summer fallow land. Other plows, which in loam or sandy soil work well, are failures in heavy clay or gumbo. This is the most uncontrollable factor in scouring and is one in which experience counts.

Stubble plows have other forms besides the simple hand plow above described among which may be mentioned sulkies and gangs. These resemble each other in most respects with the essential difference that the sulky has only one bottom while the gang has two or more, and I will therefore describe only the sulky. In its most common form the sulky plow consists of a frame supported by three wheels in which the plow proper is hung by bent rods known as bails. Most sulkies have a pole or tongue attached to the extended upright axle or staff of the front furrow wheel and from this point of attachment a rod is connected to a crank on the staff of rear furrow wheel so that any movement of the pole turns the front and rear furrow wheels, so as to permit the plow to be drawn in the direction of the pole without skidding these wheels. The third or land wheel is on a bracket bolted to the frame and does not change its plane of motion in regard to the plow, but may be raised and lowered. In operating a sulky plow the most important point is the proper adjustment of the three wheels so that the plow will do the best work. All three should be set so that the plow will go the required depth and be at the angle desired. The furrow wheels are usually adjusted so that they will hold the plow over against the furrow, thus relieving the pressure on the landside and reducing the draft caused by friction. They are also adjusted to permit different methods of hitching the horses. Some of the newer plows have a spring-tongued lever which adjusts the angle of the front furrow wheel much more quickly and conveniently than the more common method of loosening the bolts which hold the tongue to the casting on the staff head and re-adjusting them. The wheels of the best plows are provided with dust caps and compression grease cups, these providing for the best lubrication and this is important, as the axles bear the downward pressure of the soil on the plow-bottom, thus diminishing the friction between the sole of the plow and the soil and thereby lightening the draft. The frameless sulky has an advantage over the frame sulky in actual weight but the absence of the foot lift is an inconvenience felt by every plowman and in addition the frameless plow is not capable of such accurate guiding or adjustment as the frame sulky.

Besides stubble and sod plows there is the sub-soil which differs from them and is little known in this country. Its intelligent use is undoubtedly beneficial to most soils but great care should be taken not to bring too much sub-soil to the surface at once. It is especially useful where hard-pan exists and where the sub-soil differs but little in general character from the surface soils.

Plows, besides their main parts, have several accessory parts

Continued on page 85

A Corner in Monuments

By William R. Lighton.

If you happen to be caught overnight in Cheyenne, between trains, with nothing on your mind and with not a friend in sight, what do you do? You go out and walk the streets, don't you? All right; that's what I did. And if you miss seeing anything worth looking at for as much as thirty minutes, till weariness threatens, and then, at the critical moment, you happen to pass Dougherty's place, with its blaze of friendly lights and its sturdy chorus of jocund male voices roaring defiance in the face of tedium—again, what do you do? Why, you turn in, don't you? Sure! That's what I did. And there sat Steve Brainard.

But something was wrong with Steve. It needed only one short, quick look at him to prove that. Judge for yourself. Our last meeting was a full year gone—a thing of remote antiquity, as the frontier runs; but he seemed mightily indifferent, moodily unaffected. He gave me the barest, curtest nod, and the grip of his big hand had no ginger in it.

"Glory, Steve, but I'm glad to see you!" I said.

No smile broke through the tension of his lips. "You're awful easy pleased," he growled, and dragged his hat lower over his sulky eyes.

"Steve, what's the matter with you?" I demanded presently, for this was utterly unlike him.

"Broke."

"Oh, shucks!" I retorted, as my hand moved toward my pocket. But he would have none of that. He gave a grimace of angry irritation.

"I didn't say I was just short. I said I was broke. Don't you understand — broke! A man's friends can't do nothing for that."

So I drew up a chair and sat at his side. "Tell me," I said.

"Do you need to have it explained to you?" he retorted. Sullenly he fished out of his clothes a tobacco sack, lean with famine, and a crumpled bit of paper, and in cross silence he rolled a cigarette. An impotent-sounding oath was exhaled with the first breath of smoke.

"I'm gettin' awful tired of this thing. What's the use of millin' your heart out at your job for eleven months and a half, every year, and savin' enough at it to go plumb, rank broke on with a little old nine days' frisk? Where does that leave a man for the other five days? No, sir! I've been makin' up my mind to it, and I'm goin' to do it."

"Do what?"

"Graft. Yes, sir, I'm goin' to try graftin' a whirl."

"You're not," I said.

"Oh, I ain't! You just keep your eye on my trail for a spell."

"You're not serious. It's a poor business, Steve."

"Any poorer than this?" He brought from his pocket a dime and a nickel, which appeared woefully small and futile in the middle of his huge palm. "Three hundred and twenty I had, when I hit this town; and this is all I got left. A year's good hard work all shot to rags. But I'm a year older than I was, anyway, and a whole heap wiser. That's what makes me say what I do." He gave me a sidewise glance. "Which way you headed, Billy?"

"West," I told him. "Rock Springs way."

"So? I been thinkin' west myself, some, settin' here. I expect I could rustle a pass, mebbe." Not for long could his wholesome, outdoor mind keep a morbid temper. A grin caught him unawares, and then he laughed. "I ain't goin' back to the ranch, Billy, till after I've put a patch on this tear of mine. I'm goin' to have somethin' to show for it. I'll go up the road along with you, tomorrow—if you don't mind travelin' with a grafter."

Maybe you have been out West, by the Union Pacific, over the Continental Divide. Then maybe you remember the station and the monument. That part of the line is abandoned now, for a shorter cut; but in the earlier days it was a feature, with the trains stopping to permit tourists to buy trinkets and mail souvenir post-cards to their friends from the highest railway station in the world. And there stood the monument.

"Yes, Sir, I'm Goin' to Try Graftin' a Whirl"

It had been built to the memory of two names that are still respected back East one hears; names of men who were potent in the old time when the road was a-building and when there were schemes to be juggled through. Never mind that part of it. The railroad company paid for the monument; and there it stood, rearing its huge granite bulk in the heart of the wide desert; most awfully stately, and imposing, and all that.

"Sixty foot across the bottom, and plumb as high," Steve murmured, as we loafed at its base, waiting for our engine's warning whistle. "Must have cost a heap. How much would you reckon, now?"

I didn't care how much it had cost. I was watching an elderly Englishman in tweeds, drawing near with a couple of his womenfolk, in charge of a native showman playing for a tip. The tourist put up his British eyeglass, bent backward his thick, pink British neck, and gave a stolid British stare upward toward the topmost granite altitude.

"Fawncy, naow!" he said. "Most extrawd'n'ry!"

"An' it weighs a million ton an' it cost four million dollars," recited the native. Maybe those aren't his figures. Any others will do as well.

"Judas Priest!" Steve whispered in a low voice aside; and then his fine eyes narrowed as he caught the showman's next words:

"An' when they built it, they made out they had it on a railroad section. But they hain't. Somebody was runnin' a line, a while back; an' they've got it on Gov'ment land, by mistake. It don't matter, though; the land hain't worth a cent a mile."

When they were gone, Steve made another slow circuit of the granite base, then halted at my side, his hand resting lightly upon one of the great blocks, his eye making another appraisement of the imposing dimensions.

"She's a right good little old monument," he murmured, half to himself. "Four million dollars! It would sure cost a heap to move her, wouldn't it?"

"Thinking of buying it?" I questioned frivolously.

He gave me a mild glance and a gentle smile. "I'm thinkin' of acquirin' her," he said softly. "There ain't but one like her. If a man owned this one, he'd have a corner in 'em, wouldn't he? I should think——"

The engine shrilled at us, and we started down the stony slope. Half-way, Steve gripped my shoulder, halting in his tracks.

"Billy! Wait! I'm thinkin'! Come on back to Cheyenne with me. Talk about grafts!"

Another impatient, explosive toot, and the conductor shouted in anger at our loitering. I broke into a run, with Steve loping easily at my side.

"Won't you come? Well, then, stake me to twenty-five dollars—quick! I'll join you, out yonder, in a couple of days. Talk about your grafts!"

Three days later we had a reunion at Rock Springs. Not a word did he vouchsafe; but it was plain enough that things were going to his liking. He seemed no longer concerned about finances. Out of his small borrowing he had managed to keep a few dollars, and these he jingled contentedly in his trousers pocket, whiling the time, showing no dismay as the small fund slowly dwindled. "I'll have more, pretty soon." That was all he would say to account for his unaffected tranquility as he loafed about, watching me at work over my coalmining statistics. Oh, yes, it's respectable labor; but it's most deadly dull. After three or four days I got to wishing with all my heart that Steve's deal, whatever it might be, would yield a taste of refreshing fruit. But the slow days, standing in listless line, by and by reckoned up a week, and still there was nothing doing.

Then one evening I sat in my room, mulling over my mess of figures, when there sounded a knock; and the knocker turned out to be a short, wide bunch of a man, immaculately togged, gold-spectacled, with a big, bulging benevolent brow and a thunderous bass voice—a lawyer from Omaha, ranking high in Union Pacific service. He has held down a seat in Congress since that day, besides making a fair-to-middling name for himself as an amateur poet. We had had truck with one another at headquarters, so there were no preliminaries.

"Say," he began directly, "who's this Steve Brainard? He's been hanging out with you, they tell me. What sort of an ass is he, anyway?"

"All kinds," I told him. "Why?"

He gave a deep-toned laugh; but its breadth of surface was disturbed by tiny wavelets of irritation. He drew from his pocket a mussed scrap of paper and held it tentatively forward.

"Will you keep your mouth shut?" he questioned.

"Oh, tight!" And this is what he showed me:

Union Pac. R.R. Co., Omaha.

Dr. Sirs, I have took up a desert claim on the Divide on Government land where you have got your Monument located, and I want you if you won't please to move it off because it is gowing to be some in my way and too big to be gowing around all the time, and shuts off the Veiew. I do not want to put you to a hurry but the sooner the better. I am gowing to start my improvements right soon. I will be at Rock Springs a while and you can write me to that place and tell me how soon if you want to. Hopeing I am not puting you to much trouble I am yrs respy,

Steve Brainard.

Who could have helped laughing? But this sign of merriment appeared to rasp the wide man's feelings.

"Does he mean it?" he challenged. "Is he capable of playing that sort of a game?"

"Who? Steve Brainard? Colonel, a friendly tip: Steve Brainard is entirely capable of robbing Satan of his fiercest horn, making it into a toy whistle, and then tooting ribald ragtime up and down the main streets of Hades. Do you happen to know whether his claim is straight?"

"Straight? Of course it's straight, so far as forms go. Should I have come clear out here otherwise?"

"Oh! Then you've come a-purpose? Well, then, the question is— What is the question?"

He began a very deep bass and exceedingly profane chant, his fat, well-kept fingers drumming an obligato accompaniment on the table top.

"Steer me up against the fellow to-night, will you? I'll have to treat with him, I reckon."

It was a memorable hour, that first one of their meeting: the colonel extremely splendid and impressive and full of a faked politic friendliness; Steve extremely lamblike and bland and full of a faked timidity in the presence of such grandeur—for the colonel's fame was thickly smeared over a big bunch of States, his name a name for working black magic. Looking, on, one would have thought that the tall, sun-browned cow-man was really a devout respecter of name and fame—and meek adulation was the breath of the pudgy man's nostrils. That's where Steve had his adversary dominoed before a word was spoken.

"I'm sure terrible pleased to meet you," he said, with exquisite shyness, awkwardly fingering his hat brim. "We've been hearin' tell about you, all over the range country."

"Ah, indeed!" beamed the great man. "Well, come; let's sit down and ripen a better acquaintance. But wait till I see what they've got in bond at the bar." We found a quiet table, and the wide lawyer set about establishing the

Continued on page 83.

Womans' Department

Conducted by PEARL RICHMOND HAMILTON

A HOUSEHOLD FORUM FOR THE DISCUSSION OF EVERYTHING THAT PERTAINS TO THE HOME

IS IT FAR?

Is it far, do you think, to that beautiful land?
To that city that shineth like gold?
Where the ones gone before to that glittering shore,
Are gathered safe into the fold?

Is it far to that realm of joy and love?
Does the river flow widely between?
Does that Heavenly home seem far, far above?
So far that you catch but a gleam?

There's something that tells me that land is not far—
And the River of Life is not wide
There's a feeling within me that the angels are near,
And that often they walk by our side.

And oft in my slumbers I seemingly dwell
Among the bright beings of Light.
And I roam, hand in hand, with the radiant band,
While the river flows calmly in sight.

And though I awake from my dreams of delight,
And open mine eyes to the day,
Yet, they linger around me, these visions so bright,
And they seem not to fade quite away.
And there's something that tells me, Heaven is near,
And the river flows calmly and still,
And the beings who dwell there, so cherished and dear,
Can glide back and forth at their will.

CONVENTION OF MANITOBA HOUSEHOLD SCIENCE ASSOCIATION.

(By P. R. H.)

During the convention of the Agricultural Societies held at the Manitoba Agricultural College, February 14th, 15th, and 16th, the second annual convention of the Manitoba Household Science Association held sessions so full of interest and instruction that I am sure. Manitoba homes will be very greatly helped as a result of the splendid lessons and demonstrations given by those who took part.

There were one hundred ladies at the opening meeting on Tuesday afternoon. Mrs. A Chisholm, of Morris, very ably filled the chair. Principal Black delivered the address of welcome. He said that the agricultural societies had improved the farms and he was sure that the Household Science Association would do much in bettering the homes. There are now seventeen household science associations in Manitoba with a membership of five hundred. Mr. Black has recently attended the agricultural convention at Washington, D.C., where he was impressed with the fact through labor saving devices and knowledge gained at conventions the farmers' wives had been able to manage their work so that they had time for study and culture. He stated that there is not enough consideration given to labor saving devices such as kitchen ranges, oil stoves, sinks and running water in the homes. Mr. Black promised the Household Science Association all the assistance and support possible from the Agricultural College.

The reports from the various associations showed marked interest in the work among the women who belong.

In the first report from Morris, Mrs. Chisholm stated that their association was organized August 13, 1910. Morris has reason to be proud of having organized the first association in Manitoba. Mrs. Chisholm said that the object of their association is—mutual help in domestic affairs and higher social life for country women. They have a membership of sixty-two, and their meetings are monthly. Two women are asked each month to contribute papers on subjects of their own choice, suitable to the month. For the month of August, they discussed Pickling and Preserving; for September, Storing of Vegetables; for October, Labor Saving Devices; for November, Local School Defects and Remedies; for November, Demonstration of Christmas Gifts; for December, Desirability of Trained Nurses for the Country; for January, Literary Lesson—The Life of Tennyson; for February, Discussion of Mark Twain. This is a splendid programme, and I am sure the women in and about Morris must have found it instructive, interesting and helpful. Mrs. Chisholm further stated that the Morris Society aims at philanthropic and charitable benefits; that there are boundless opportunities and high ideals—they would raise the standard of health and morals in every possible way.

The report of the Morris Society was very interesting to me and we may expect great results from a community with an association as progressive as is this one.

The delegate from Carman represented their society with an excellent report. She stated that the first meeting was well attended by an enthusiastic crowd. One member gave a paper on Benefits of a Course at the Agricultural College. She advised all girls to take a course. The Carman delegate suggested that a travelling library would be helpful and that every home needs one good newspaper, a few good books and good magazines. Other subjects that have been discussed and planned in the Carman association are: Order and System in House-keeping and Demonstration in Candy-Making (the candy was brought in and sampled by the members); Easter Thoughts and Dishes; Care of Typhoid Patients in the Home; Care of the Teeth; and House Cleaning. The work in the Carman society is drawing the members closer together and is helping them, and they are to be congratulated.

Miss Taylor from Valley River also gave a good report. The Valley River society is known as The Ladies Mutual Benefit Society. She said one woman very kindly offered the use of her home for the meetings. Everybody is made welcome. They have fortnightly meetings; the first hour is devoted to business and the second to refreshments furnished by the members. They have music, singing and read papers from agricultural journals. Mrs. Jones, whose home is so generously opened to the association, said that the whole community is grateful for the organization as it takes away the drudgery of the daily life and gives one more confidence in her work.

Mrs. Fraser, representing the Emerson society, stated a membership of twenty-four. She said they had been helped by demonstrations on Home Dress-making.

Hamiota has a membership of thiry women, and Headingly has twelve.

The largest association in the Province at Manitou.

The delegate reported a very progressive society with a membership of 108. They have had papers on several important subjects; one was St. Valentine's Day, the object of which was to encourage sending pretty valentines; at one meeting Bread-Making was discussed, and at another this very apt subject—"Why all Women should belong to the Society." The Manitou association meets monthly and is held in the Normal School building. We shall expect great things from this society, judging from the active interest taken by the Manitou women at the convention. They are women of ability and ambition.

Mrs. Evans, of Minndosa, spoke of the value of buying books bearing on home-work. These used in the meeting would aid very materially Miss Juniper, of the Agricultural College offers to give the address of any such book to anyone who wishes it.

The delegate from the Morden society emphasized a very instructive lesson they had demonstrated in their meeting on Short-cuts to Home Sewing. The members brought newspapers and cut their best patterns for one another.

The Swan Lake association has 33 members. They had an address on Infectious Diseases by a doctor.

Other societies were represented by delegates who gave good reports of their work.

After the reports, Miss Kennedy, of the Manitoba Agricultural College Staff, gave demonstration of a hat. She gave a very interesting talk upon the development of the hat, tracing it from Biblical times to the present day. She stated that in times past a hat was in fashion one hundred years; today it is in fashion one hundred days. Miss Kennedy said that the milliner must study her client for a hat as a sculptor does his model. The general outline is line, form and color, and a stable rule is—a hat should not have more than three kinds of trimming.

At the close of the first session, Major Dyer brought greetings to the women from the men's association; he assured them that the men were in sympathy with the Household Science Association and would lend assistance at any time.

The evening meeting was largely attended and both men and women manifested interest. Hon. G. R. Coldwell occupied the chair, in the absence of Premier Roblin. In his address, which was masterly and convincing, he advocated a change in the present school system. We should pull down the little one room school houses and build agricultural schools and proper country high schools, so that the country boys and girls can have the same opportunities that the children of merchants have.

We were all interested in Miss Juniper's paper on the subject of "Men and Home Development." Miss Juniper's thorough knowledge of the science of home-making enables her to handle the subject in a superior manner. She believes that home-making is the highest of arts, because it demands in the members of the home, the development of that which is physical, mental and moral. Miss Juniper stated that the aifments in children could be prevented by educating men and women in sanitary science. She advised the farmers to study the building of homes and to insist on the sanitary conditions of the water and food supplies.

On Wednesday afternoon, Miss Juniper demonstrated very successfully a full lesson. She dressed a chicken, cooked it in the fireless cooker, and demonstrated an artistic and appetizing manner of serving it. Miss Juniper also baked a cake in the fireless cooker. I am sure every woman present wanted a fireless cooker. It saves saves the feul and work. It is a labor saving device. The lesson proved that cooking may appeal to the artistic side of woman's nature.

Mrs. Collins, of Miami, prepared one of the finest papers given during the convention. It was read by her sister, Mrs. Van Norman. The subject, "Teaching Lift Truths to Children," was handled so intelligently and so skilfully that every woman present was touched with genuine sympathy.

The Wednesday evening's session will long be remembered. Mrs. Nellie L. McClung, Canada's popular and telented author, gave an address on "The Importance of Social Life in Country Homes." Mrs. McClung is unusually gifted in her manner of delivery and expression, and I am sure her address will remain with her audience a long time. I quote some of her sentences from the "Free Press":

"More people are defeated in the battle of life by what is behind them than by what is before."

"Many a man and woman is able to make a brave fight and bear heavy burdens and win success because warm in their hearts is the memory of a happy childhood."

"It is so easy to make children happy when they are keen for a good time, $2.00 will bring more happiness to the children now than $2,000 spent on them later in life."

"Everyone is lonesome more or less."

"Do any of you women know what it is to be so lonely that you come to look furtively behind you feelin g that you are being followed by a presence; so lonely that you hear strange whispering voices close to you and feel they are plotting against you; so lonely that when you pull down the blind at night you pin it on each side close to the wall to shut out the great white desolation without that seems to be pressing upon you; so lonely that when you go out of doors and look at the horizon it seems rushing forward and pressing upon you until you cannot breathe. That is prairie loneliness and it leads to prairie madness, and there may be women in your district suffering from just that kind of loneliness. I have met them. What these women need is not a good straight talk and to be told to control their nerves, they know that themselves; what they need is human sympathy and companionship."

"It is my duty to make myself good and make my neighbor happy.'

"It takes a clever man to build a watch, but a two year old boy can smash it with a hammer in a minute. You do not need to be clever to criticize. Constructive work requires brains, but any one can destroy."

The last day of the convention was extremely interesting. Very able addresses were given on Horticulture, a subject of great importance in Western Canada.

Miss Lillian Beynon presided. Miss A. F. Playfair, editress of the Hartney Star, gave the first address on the subject, "Tree Planting from a Woman's Standpoint." She stated that trees and flowers give beautiful ideals

to the growing child as well as to men and women. Miss Playfair also said that trees were a protection from the hot winds of Manitoba and from the cutting wind in winter. She also showed how trees increase the value of property and they also add to the character of the people — giving the Western people those qualities of strength, "which the felling of forests has given to the east." Miss Playfair gave proofs that trees preserve moisture.

Miss Ruth Lloyd, of Morden, gave an able address up on the "Possibilities of a Farm Garden." She showed the need of giving flowers and plants attention on the farm and gave some valuable suggestions on growing of them.

"The Place of the Garden in the Life of a Busy Mother" was splendidly handled by a woman thoroughly familiar with her subject, Mrs. Vialoux, of Sturgeon Creek. She said that it is the duty of a mother to spend some time every day in the garden.

Miss. A. B. Juniper spoke on "The Influence of Flowers on a Home." She said that flowers are necessary to bring out the best in us. They are useful in the education of a child as well as soothing in their beauty.

Miss E. Cora Hind gave a very impressive picture of an old-time garden. Her audience was carried back to the old-time gardens of their childhood and she made every one realize the importance of association with the beautiful flowers in their life-work

This convention will mean a great deal to the people of Manitoba, as did the recent convention held in Saskatchewan. These socities are the means of drawing the women in the West nearer together and this social life will develop moral, intellectual and physical strength in country women. They need to have promoted any association that will bring them together for sociability and mutual helpfulness. These societies will make their life less lonely and will change their housework from drudgery to pleasure. Let us do all we can to encourage them.

MOTHER'S CORNER

"The love principle is stronger than the force principle."

"A kiss from my mother made me a painter." Benjamin West

"In great crises it is a woman's special lot to soften our misfortune." Napoleon Bonaparte.

The mother in her office holds the key of the soul; and she it is who stamps the coin of character, and makes the being who would be savage, but for her gentle care, a Christian man.

MOTHER'S INFLUENCE.

Next to the sovereign grace of God, the influence of a mother's teachings and example is the most effective in moulding character and shaping destiny. Rev. T. L. Cuyler, in "Golden Thoughts," says: Intellectual power even descends most commonly on the maternal side. Nearly all the most remarkable men have had mothers of more than ordinary mental calibre. Great men often have weak children; great women seldom have.

But it is in the direction of moral training and the development of character that the mother is most powerfully felt. What a faithful suggestion lies hid in that brief line from Holy Writ—"His mother made him a little coat." The woman who wove that little tunic was Hannah. The lad who wore it was Samuel, who grew from beautiful boyhood into the holy prophet and the upright ruler. No doubt that it was a modest and comely garment which the Jewish matron made; for she was a woman of too much piety and good sense to treat her consecrated child as if he were a plaything or a doll.

But that "little coat" has a figurative application to every mother's high calling. For she not only provides her child from infancy's first moments with clothing for the body, but moral "habits" of character and conduct. The mother, more than any one else, helps to clothe the immortal soul in garments of light and loveliness, or else in garments of sin and sorrow and shame. She makes "little coats" which no moth can consume, which never wear out, and which are worn by her offspring long after she has moulded into dust. She weaves her child's habits of thought and conduct; and does it, too, as clothes are made, stitch by stitch. She does this not only by good deliberate teachings, but by little words and acts and by silent, unconscious influence. Hannah's daily life helped to weave Samuel's noble character. The mother made the man.

Many lives have been disfigured by the wretched "botch-work" or the deformities of such mind-garments as weak or wicked mothers have woven for their children. The brilliant Byron might have been a very different man if he had had a different mother and a wiser early training. Children seldom rise higher than the fountain head of the mother's character. Occasional exceptions do not shake the solid certainty of this rule. "Show me the mother and I will show you the man" is a veracious maxim after all. There are tens of thousands of others who can testify that a faithful mother's teachings were worth more to them than the fortunes of a score of Vanderbilts. Even the diadem which Victoria wore as Queen of Great Britain and Empress of India shone not with such enviable lustre as that higher crown of the pure wife and exemplary mother.

While the relation is so vitally important in shaping lives and determining human destinies, everything which helps to instruct and inspire mothers for their high calling is of great moment.

There are several essentials to a good home. Wealth is not one of those essentials, for in many an abode of honest poverty contentment dwells. Out of such lowly cottages and cabins have sprung our greatest, noblest men and women.

DROWNING.

Drowning or suffocation is an accident which every mother should be able to cope with. The following methods, if carried out immediately and persistently, will be efficacious. 1. Loosen the clothing, if any. 2. Empty the lungs of water by laying the body on its stomach and lifting it by the middle, so that the head hangs down. Jerk the body a few times. 3. Pull the tongue forward, using a handkerchief, or pin with a string, if necessary. 4. Imitate motion of respiration by alternately compressing and expanding the lower ribs about twenty times a minute. Alternately raise and lower the arms from the sides up above the head to stimulate the action of the lungs. Let it be done gently, but constantly. 5. Apply warmth and friction to the extremities. 6. By holding the tongue forward, closing the nostrils and pressing the "Adam's apple" back (so as to close the entrance to the stomach), direct inflation can be tried. Take a deep breath and breathe it forcibly into the mouth of the patient, compress the chest to expel the air and repeat the operation. 7.DON'T GIVE IT UP! People have been saved after hours of patient, vigorous effort. 8. When breathing begins, get the patient into a warm bed, give warm drinks, or spirits in teaspoonfuls, with fresh air and quiet surroundings.

In case of Poisoning, the following points, if remembered, may often save a life. 1st. Give an emetic, which can be a glass of warm water with as much common salt as it will dissolve, or ½ teaspoonful of alum stirred up with some molasses; or, if these fail, a teaspoonful of mustard in a large quantity of water. Keep the child lying down and allow it to vomit in a towel or old cloth, except in poisoning from opium, morphine, paregoric, or chloral, when it should be kept awake by walking or hitting with wet cloths. If the child appears weak, stimulate and keep it warm.

CALMNESS AND SYSTEM.

Calmness and system are two of the essentials in training the baby. The clothing of the baby should be loose, warm and light, in other words, per-

fectly comfortable, and the bed or crib should be placed where the fresh air will circulate freely around and over every part. Of course, do not place the babe in a draught, says Health Culture. A most pernicious habit is indulged in by some mothers and nurses, viz.: Covering the baby's head and face so the same air is breathed and rebreathed repeatedly. The blood is the life, and in the lungs the blood is purified, but a dirty dish cannot be cleaned by dirty water, neither can the blood in the lungs be cleansed by foul air.

Next in importance to fresh air is drink and nourishment for the little one; this should be given at regular intervals of about an hour and a half through the day, gradually lengthening the period as the child grows older, and feeding the child once at night is usually sufficient. A nursing mother should be careful of both her physical and mental state for milk in her breast may become unfit for use, not only by reason of sickness or great fatigue, but also from worry, anger or any unusual mental disturbance. In fact, it is only two days since I heard of a mother who nursed her babe when she was violently angry, and the little one died soon after consuming the poisoned milk.

If the child is fed either with a spoon or from the bottle the milk should at first be diluted and given according to physician's directions. It is better to use sugar of milk rather than cane sugar for sweetening, as the latter is injurious and disturbs digestion.

Many baby foods on the market will agree with baby for awhile then something else must be tried.

It is the universal opinion among medical experts that the nourishment from the breast of the healthy mother is the natural and best food for the babe, though fashion and expediency sometimes seem to point the other way.

It is ewll to give baay a drink of water several times a day; this not only relieves thirst but helps to prevent a tendency to constipation.

Under no circumstances allow a light to fall upon the eyes of your little one, especially when sleeping, for it may cause restlessness and wakefulness and, far more, it may injure the eyes permanently.

A daily tepid bath and rub is most necessary, or if the child is thin or anaemic, a thorough massage with sweet olive oil is a good substitute, or the water bath may be given first, followed by the one of oil.

Cleanse the mouth and nasal passages for baby every morning until he is old enough to do it for himself and the habit is thoroughly formed.

From the first baby may be taught habits of cleanliness. About once every hour (the length of time must be determined by experience) remove the napkin and hold the child over the vessel, allowing the bowels and kidneys to move. With a little patience the habit can be formed; if the mother is not strong enough, hire some one for this special duty, if necessary; the saving in the laundry bill will cover the extra expense.

A baby shoull never be exhibited and paraded for the amusement (perhaps the veiled annovance or ridicule) of visitors. The handling, jolting and general connfusion is bad for its nerves.

A baby should sleep or lie quietly crowing or playing with its fingers or the sunbeams most of the time.

Never forget that each act repeated tends to form a habit, and that it is much easier to form a good habit than to break a bad one.

RECIPES

Boston Brown Bread.

"I hive a recipe which I have tried and found excellent for brown bread with raisins; it is as follows: Mix and sift one cup of rye and Indian meal and one cup of white flour with two and one-half teaspoons soda and one of salt. Add one-half cup of molasses and two cups of thick sour milk, or one and three-fourths cups of sweet milk, then add to the mixture one-half cup cut raisins. Turn into a buttered mold and steam three hours, then uncover and place in oven about ten minutes.'

Boston Brown Bread.

Two cups graham flour, one cup cornmeal, one level teaspoon soda, one teaspoonful salt, two cups sour milk and three-fourths cup molasses. Sift salt and soda with flour, mix thoroughly and add molasses and sour milk enough to make a stiff batter. Beat well and fill well-buttered mold or cans not more than half or two-thirds full. Place in kettle of boiling water, allowing water to come almost to the top of the molds. Boil for about three hours and then put in oven to brown. Use empty baking powder cans for moulds.

German Cookies.

The Germans have a delicious cooky which is often served with ices. For this, take one pound of powdered sugar and six eggs, and mix together. Set the dish with the mixture in it in a bowl of hot water and stir until the contents are warm. Then take it out and set into a bowl of cold water and stir until cold. Add flour until you can drop the mixture with a spoon onto a greased pan. Add vanilla, about two teaspoonfuls, and then drop the cookies onto the greased pan and let them stand over-night. In the morning bake in a hot oven and they will have on top what seems to be a sugar frosting, but which is the white of the eggs come to the top.

Baked Creamed Onions.

Peel the onions and remove the thick layer next to the skin. Cook in salted water three minutes, drain them, cover with boiling water and cook until nearly done. Drain well, and place in a baking dish. Heat a large cup of milk, thicken with tablespoon of cornstarch mixed with cold milk, add a tablespoon of butter, pepper and salt to taste, and pour over the onions. Bake fifteen minutes, add a layer of buttered cracker crumbs, and bake ten minutes longer.

Fig and Nut Layer Cake.

Cream together three-quarters of a cup of butter and two cups sugar. Then beat in yolks of three eggs. Sift three cups flour with three teaspoons baking powder three or four times. Add cup of milk, alternating with flour until all is used. If a little too stiff, add one-quarter cup more milk. Last add the beaten white of three eggs. When cool put together with a filling made as follows: Boil together one cup sugar, one cup of chopped or ground figs and water. When thick, spread between layers, add one cup of chopped or ground nuts.

Recipes for Carrots.

Cream Carrot Soup.—Grate the carrots, cook in milk, and put through a sieve. Or you may boil the carrots, cut in pieces, with a dash of sugar, slice of onion, sprig of parsley and lump of butter. When tender (only a very little water should be used), rub the vegetables through a sieve into the water again, and add scalded milk. Thicken with butter and flour rubbed together.

Oatmeal Muffins.

Soak two cups rolled oats in one and one-half cups sour milk ever night.

In the morning, add one-fourth cup melted butter, one-third cup sugar, one egg, well beaten, one teaspoon soda, one-half teaspoon salt, and one cup flour. Fill buttered gem-pans two-thirds full of mixture and bake in a hot oven.

Pork Cake.

An inexpensive and hearty cake for winter. One pound pickled pork, ground very fine. Pour over one pint boiling water, two cupfuls chopped raisins (seeded), two cupfuls white sugar, one cupful best New Orleans molasses, one teaspoonful soda, seven cupfuls flour well sifted, two teaspoonfuls mixed spices. Bake in a slow oven. —Mrs. M. E. Scott.

A Cheap Tea Cake.

One egg, one cupful of sugar, one-half cupful of butter, beat well. Add one cupful of sweet milk into which you have dissolved one teaspoonful of soda and two teaspoonfuls of cream of tartar and two cupfuls of flour. Bake in a quick oven. Cover with whipped cream flavored with vanilla. — Mrs. M. E. S.

EXPERIENCE EXTRACTS

Care of the Hair.

Beutiful, soft, lustrous hair is the crown of beauty which all women desire and few possess. Its attractiveness depends less upon color, texture or even abundance, than upon careful grooming.

The first law in the proper care of the hair is cleanliness; the second, ventilation; the third, exercise—precisely as in the general health of the body.

As to cleanliness many conflicting opinions have found their way into print concerning the frequency of the bath.

"How often shall I wash my hair?" she sensibly wants to know. There are two great classes of hair, the dry and the oily. The fine, dry, blowaway variety needs actual washing not more than once in four or five weeks, and a dry shampoo between the whiles. With this kind of hair the scalp is often tight and hidebound, and a little olive-oil worked about the roots with a firm rotary massage an hour or so before the bath, relaxes the stiff muscles and stimulates the glands. Massage is the exercise of the hair. Borax, ammonia and alcoholic washes should not be used on dry hair.

For oily hair the reverse treatment is necessary. Here a bath once a week is not too often, and a few drops of ammonia are not amiss to cleanse the clogged-up pores. The oil, instead of remaining in the scalp, runs out upon the shaft and mats around the roots in thick flakes. An excellent practice after the bath is to take a very small soft brush, and go over the scalp inch by inch to remove the more stubborn incrustations—more exercise, you see. A good dry shampoo consists of powdered orris-root shaken on to the scalp, massaged and brushed out thoroughly. An hour of these treatments twice a week for even a month will produce remarkable results. The hair takes on vital glow and sheen.

A Good Crack Filler.

Dissolve one pound of ordinary glue in a pint of boiling water. To this add enough sawdust to make it of consistency, to spread well. This is an excellent, easily made, inexpensive material for filling cracks in old floors before varnishing or painting.

Kerosene Oil Stains.

Kerosene oil spilled on rugs, carpets or any woollen goods may be removed by dry flour. The flour should be put on immediately after the oil is spilled and scraped off and renewed until no odor is left in the floor. This has removed stains successfully from both rugs and dress goods.—Kansan.

Cheap and Efficacious.

Beside my sink I keep a bottle containing one-third glycerin and two-thirds common vinegar. A few drops applied to the hands after washing dishes, etc., keeps them smooth enough to do any fancy work. The men like this emollient especially.

Mending Socks.

Mending socks and hose for children may be made an easier and shorter task by cutting out a little beyond the worn place in heel and cut a circular piece from another stocking, width of seam larger than hole to be mended; sew in by machine and you have a new heel. No edge to hem down, no double piece to hurt tender feet. I double the circular piece in the heel for men and boys.

The inside lining of a freshly broken egg is a fine plaster for cuts and wounds.

A few pieces of raw onion rubbed on a troublesome chillblain is very soothing.

A few uses of common table salt in the house. Salt as a toothpowder, will keep the teeth white and the gums hard and rosy.

Salt and water held in the mouth, after having a tooth pulled, will stop bleeding.

Salt is one of the best gargles for sore throat and a preventive of diptheria, if taken in time.

Salt rubbed on the cups will take off tea stains.

Salt in the oven under baking tins will prevent their scorching on the bottom.

A North Philadelphia little girl had been so very naughty that her mother found it necessary to shut her up in a dark closet—in that family the direst punishment for the worst offence. For fifteen long minutes the door had been locked without a sound coming from behind it. Not a whimper nor a sniffle.

At last the stern but anxious parent unlocked the closet door and peered into the darkness. She could see nothing.

"What are you doing in there," she cried.

"I thpit on your new dresth and thpit on your new hat, and I'm waiting for more thpit to come to thpit on your new parathol!"

An old darky, sent to a hospital, upon his arrival was placed in a ward, and one of the nurses put a thermometer in his mouth to take his temperature.

The doctor asked "Well, my man, how do you feel?"

"I feels right tol'able, suh."

"Have you had anything to eat yet?"

"Yessuh, I had a little."

"What did you have?"

"A lady gimme a piece of glass ter suck, suh."

KINDNESS TO ANIMALS

Apart entirely from the humanitarian side of the question, kindness in handling domestic animals is good business. It is not necessary to make such a statement to those who use their brains as much as they should; but few of us do this. Many more have never been placed in the circumstances tending most to the careful consideration of the effect of unkindness to the useful dumb brutes. Man has condemned them to do his work for him; to provide food for him, living, or to be eaten by him when dead, as well as to be always in the best conditions to supply these wants. The life work of some animals is to help provide food that will make some other animal as palatable as possible when man eats him. Fair treatment should be the portion of both of these, our servants, but, alas! a great many men, and women and children, too, might learn lessons of value from the cannibals of the south seas. At least these last appreciate the benefit of allowing a missionary time to gain confidence and become hopeful enough to regain the appetite that his capture had scared away, before his prominent part in coming festivities is made too evident to the good man. Literally speaking, the effect of mind over matter is evident in all the species of dumb brutes. Many so called physical conditions, which we know to be beneficial or otherwise to some animal, are really the result of mental processes. He is a poor specimen of feeder who will allow his pig which he is fattening to live in terror of a dog or some other animal worrying him. He may bang him about himself, but that does not count. Any reasonable pig should know that its owner wants him to eat all he can and grow as fast as possible and should not notice an occasional pitch-fork prod when he gets in the way.

Clever people are thoughtless sometimes on this question and some need a lot of teaching. The writer once knew a very clever man, certainly intellectual, because he managed a bank very successfully in Manitoba when times were hard; and the papers call him one of the Montreal millionaires now. Well, this man kept a dog tied up or shut up in a small yard from the milk stage till the open season for ducks. The dog followed a buggy till he was pretty tired and a flock of ducks appeared. The horse was tied to a weight and guns were got out. Doggie thought it was nice to have a rest about that time and rolled about in the glass. A duck was shot which dropped in a slough. The embryo millionaire turned eyes on the dog and utter scorn mounted his features. His first remark was, "that d—n fool of a dog is not fetching that duck." He was glad to part with the animal that lived to fetch everything that wore feathers for his companion of the afternoon.

This man did not think. He had never trained a dog but he had seen dogs retrieve and supposed that all retriever dogs would retrieve, as all egg beaters will beat eggs if you turn the handle.

A presumption of this kind seems to be entertained by all people who do not have the knack of handling animals, especially those who have not associated with the dumb creation from childhood and who have not been taught to study and observe. It is an old saying that "a stockman

is born, not made," and very true it is. There are people—not all men by any means, who, while obeying every rule laid down for their guidance in caring for stock, seem to move in an atmosphere of antagonism with every dumb creature, though they are not unkind to them. Wherever they move you can see hostile demonstrations from those usually docile, or absolute indifference from others that make pronounced advances towards those of whom they are fond. Once show an animal you fear him and he holds you in contempt. Sympathy is the key note of success. A man is sick in a hospital. The nurse is a success or otherwise more by the sympathy, real or well feigned, displayed for her patient than by her strict adherence to the rules laid down for her direction. The man is more easily deceived than the animal, more readily overlooks neglect and is more easily cajoled into trustfulness again. The animal looks for results. A nurse may join a gossiping gang down the corridor and let her patient ring till he is tired. She comes back with a hard luck story or some fabrication, sterotyped in the institution for green patients, and the poor fool on his back is satisfied. He is deceived, not so the cow. Let your dog nip her heels for a few hundred yards and she takes no excuse. She gets back at you with a poor milking. The horse that is thrashed for shying behaves worse the next time. If he is a horse that has to do a day's work every day, the extra exertion soon wears him out and he has not energy to shy or run. The driver thinks he has thrashed a vice out of the animal. The horse knows better.

What are generally called confirmed vices are very seldom such in reality. It is natural for a horse to roam pastures at will. He does not recognize the usurped authority of man to control him and naturally rebels. A horse's first impulse is to run away. He is fleetfooted and his first chance for safety is in flight. He is cornered and cannot get away. The enemy that approaches too near gets a blow. Something is attached to him. He does his best to get away but this something is tied to him; to his mouth, his shoulders or what not. He plunges; this terror tears at his mouth. In pain he stops short; the thing is after him and instantly another thing pushes him from behind. He must use some other device to get his freedom. He kicks, a novel and terrible pain is on his skin and that awful thing he can't get out of his mouth attacks him again. Whichever way he turns new enemies assault him. He runs, kicks, plunges, bucks or strikes in desperation. It may be all to no purpose and he is won out. But should a well-directed kick knock the brains out of something alive behind him and the tug at his mouth is relieved, he plunges forward. An inanimate thing behind follows as fast as he goes. He must be rid of that. A kick had just rid him of one enemy; he tries it again. Ah! something gave way. He tries it now again and again; at last he is free and runs till no pursuer is in sight. He has got clean away. Next time he fights in the same way but with the prestige of one victory and more confidence and determination. He wins again. Now he gets a long rest and is likely traded off. The new owner does not know of his previous success and is amazed and unprepared. He is traded again and so it goes on. The horse is vicious because his handler was ignorant and stupid. An animal must be shown one thing at a time and become familiar with each before a new experience is thrust upon him. If he shows fear go back to the start and show him all he has gone through without hurt, then stop. Let him think and become quite calm. If tried a second time he will likely, by the assurance inspired by uninterrupted immunities, tackle the new wonder at a venture. With good management all fear is dispelled in time, but gentle handling in every situation is the short cut to dependable tractability.

Making allowance for the temperamental differences in the other animals, the general principles of handling remain. The horse is a native of the plains. He is surrounded by firm, level ground and there is little to impede his flight, so he runs for safety. The jackass is a native of the mountains; he climbs rocky and slippery paths at a slow pace and must take his time or slip over a precipice. If he cannot get away from his pursuer without hurry he stands and kicks. The mule being half jackass inherits this trait. To the handler who trains a mule allowance must be made for this difference, but the mule will not kick always any more than a horse will always run away. Youth is the plastic and receptive stage with dumb creatures as with those that talk. The Arab horse has no fear of man for he lives with his master from birth as domestically as our cats or house dogs. When he was brought to Europe all this was changed and he was left to the brutalities of ignorant grooms. He rebelled and the mettlesome and sometimes intractable thorough-bred is the result. The almost invariable early handling and gentle, intimate treatment of the standard-bred is in effect, placing this horse in surroundings approaching those of the Arab progenitor. The result is that his nature has responded generously.

The pig is naturally a pasturing animal with a small stomach, and very clean habits. For centuries he has been fed to produce the most fat possible. This has tended to make him impatient of hunger. Stupid man pens him in a sty where he cannot keep clean and there is nothing for him to do but lie about and eat. Hunger

Continued on page 86

THE Girls' Cozy Corner

CONSCIENCE

By Ada P. Campbell.

When mother kisses me good night
And takes the light away,
I think of all the things I've said
And done throughout the day.

If I have been a naughty girl,
My heart goes pitty-pat,
At every little noise I hear,—
I think, "Oh, what is that?"

But if the day's been kindly spent,
How different it seems,
I close my eyes and go to sleep,
And have the nicest dreams!

Champion, Alta.

Dear Cousin Doris:—In the January number of this paper you asked us to send in some recipes. Here is a recipe for cookies.

Take one coffee cup and a half of sugar one quarter of a lb. of butter, mix well till the butter is into the sugar. One cup full of rich buttermilk with a little less than a quarter of a teaspoonful of soda, flavor to taste, two heaping teaspoonfuls of baking powder in flour enough to make a soft dough that can be handled without sticking to your fingers. Then put it on a bread board with plenty of flour so that the dough won't stick fast and roll it out quite thin, cut out and put in a dry pan to bake. If the oven is hot enough a pan full should bake in 5 or 6 minutes.

I do most of the cooking at home. These are what I like to make best and they can be made with or without eggs.

Do any of you girls in the cosy corner like to embroider or hemstitch? I like to very much if I have the things to do it with. This is an easy way to hemstitch if you have a machine. Have the amount of threads pulled out of the goods that you want, now baste your hem so it hangs over the edge of where the threads begin, set the stitch medium length on the machine and stitch just as close to the edge of the hem as possible, when this is done pull your hem down to where it should be and it is as good as if done by hand. You can only do the bottom this way and the top edge would have to be done by hand if you wanted it hemstitched. I most generally work this design if I have both sides hemstitched. Take four threads and fasten them together tight with a button hole stitch about three times at the bottom, now draw your thread near the top and take two of the threads that you fastened at the bottom, pass your needle along under the next two and draw them up so that they are tight but at the same time be careful that the bottom thread does not pull up, make three buttonhole stitches around these threads, then go to the bottom and take two of the threads that you fastened at the top, pass your needle on under the next two, draw them up pretty good and tight with a buttonhole stitch three times, and go to the top. Keep this up till you get around the piece you are working. It looks like diamonds when it is done and doesn't take long to work it when you once learn it.

I did quite a lot of embroidery for Christmas and now I am working on a grape centerpiece. When I get that done I will start on a linen hat, I hope to get it all done, as school starts in May and I don't think I'll have time to work on it then.

I am glad to hear that Cousin Doris has a little girl and I hoped she would tell us more about her, but I guess she didn't have time.

Well I have taken up too much room of this corner so will close wishing every success to your paper.—Your cousin, Laura Schmeelke.

Milk River, Alta.

Dear Doris—This is my first letter to the girls' cozy corner. My father takes the Canadian Thresherman. I was looking at it this evening and saw the girls' cozy corner in it, so I thought I would write a letter. I am ten years old. We have been in Canada for nine months. We came from the United States. Our nearest station is called Milk River. We live four and a half miles from town. I think that that is quite near, for some people live forty-five miles away from town. We go to the Milk River school. We haven't been going lately on account of the cold weather. I have three brothers and no sisters. I have no little girls to play with. I haven't cooked any but I haven't tried. I will tell you about our pets. We have a Scotch collie dog. She is a very nice pet, but now she has pups. My little brother can take her and harness her up. She will drive just like a real horse. I will tell you about my pet chicken. She was as tame as a kitten. In the summer time we would have the door open and she would come in and eat the bread crumbs on the floor, but one day she fell into a tub of water and got drowned. I felt very bad over it. Well, I guess I will close for this time. I wish the club every success. From your cousin—Frances Pease.

Watson, Sask.

Dear Cousin Doris:—This is my first letter to the girls' cozy corner. My brother takes the Canadian Thresherman, and thinks it a good paper.

I always read the girls' cozy corner. We are not living in Canada very long, for we just came here in spring of the year 1910.

We were first living in Wisconsin, U. S. A., and had a nice home there, but then my father sold it and we moved to Canada. We had a lovely trip and all enjoyed it very well.

We live about six miles from the town of Watson on a three hundred twenty acre farm.

The town consists of a blacksmith shop, two elevators, four grocery stores, a drug store, post office, two churches, two hotels, one restaurant, butcher shop, two livery stables, railway station, two schools, baker shop, two lumber yards, a bank and quite a few dwelling houses.

My father and brother have recently purchased a Gas Traction Engine and plows.

There are quite a few wolves in this part of the country. My sister-in-law shot one not very long ago. It happened like this. She and my sister were going home when they saw him come from the neighbor's place. He came pretty near to the buildings, so she took the gun and shot him.

For pets we have four cats and two dogs. The cats' names are Kittybelle, Teddy, Tinklebelle and Tommy. Two of them fell in a well, but then my brother came and went down in the well and took them out. It happened like this. They were playing and so one ran after the other and so the first one jumped on the well and fell in and the other went after. They are allright now. The dogs are Rover and Fido. They are both playful dogs.

I have three sisters and three brothers. One of my sisters is working at a private house and the other one is working at the hotel, both at Watson, and one of my brothers is working at the Gas Traction Co. at Winnipeg.

Well now I must close my letter for it is too long already. It might take up too much room. I wish the club every success and wish to see my letter in print. I remain your cousin—Mathilda Kufer.

Leslie, Sask.

Dear Cousin Doris:—This is my first letter to the girl's cozy corner, and I hope to see my letter in print. I live five miles from a town named Leslie. I am twelve years old. There is no school here now. I am fond of horseback riding, and cooking. When my mother was in town I helped to do the cooking. I have a nice girl friend named Jennie Johnson. We have some enjoyable times together. I must tell you about a trip we had picking raspberries. Mamma and three of my brothers, and six of my sisters went to pick raspberries. We got up at four o'clock in the morning, done our day's work, and left father's dinner ready on the table; at eight o clock the team and wagon was at the house door, and with ten of us and the lunch box, camp kettles and berry pails, there was quite a load. We drove six miles before we saw many berries, then we saw a few along side of the road; we got out of the waggon and looked around. We did not seem to find many berries, we were just going to start and go further, when one of my brothers came and called, "Just come here, the bushes are red with berries." So we stopped the team again, and tied them in a shady place in the bluff, and all started to my brother, and sure enough the bushes were red with berries. We picked till twelve o clock, when mamma gave the lunch call. We all went to the waggon to get the lunch ready, some of us made a fire, one got water, another spread a cloth on the ground, and set the dishes on it. Mamma and I cooked some new potatoes, which we brought from home. My eldest brothers fed and watered the

horses and now the lunch was ready. We all seated ourselves on the ground, around the spread cloth, and with new potatoes and cream gravy, cold meat, bread and butter and cake, raspberries and cream, and some hot tea, we had such a fine dinner in the woods. I never enjoyed such a dinner in my life. We straightened up the lunch box again and then started to the berry patch and picked till nearly sundown. We started for home with eight twelve-quart pails full of lovely raspberries, and we were all delighted. On our way home we saw six wolves sitting alongside of a bluff. They looked fine sitting all in a row. Before we got home it started to rain, and we took a canvas and made a cover for the waggon, and we had such fun holding it up to run the water off. We got home safe, and father was surprised to see so many berries. This was my first berry picking so I thought it was fine sport. I remain your cousin. Wishing your paper very much success.—Jennie McKnight.

Francis, Sask.

Dear Cousin Doris:—This is my first letter to the girls' cozy corner. I go to the Gough school; my age is eleven; I am in the fourth reader; my studies are: Reading, writing, spelling, arithmetic, Canadian and English History, grammar, composition, geography, and my teacher's name Miss J. D.

I like spelling and reading the best of my studies. My brother is writing to the Boys' Camp.

It stormed here to-day and at school we didn't think we would get home, but it stopped a little bit and we all started home. We live a quarter of a mile from the school so we have to walk every day.

I am going to write about something that happened last winter. We were at school one day and an awful storm came up. After school was over we could not see the snowbank in front of the school; my brother said he was going home and bring over something for us to eat. So he left and got home alright. Papa and mamma said that he was not to go back to the school, so Virgil (my brother) put a box of crackers in a sack and came back to the school. We wanted him to stay, but he said that father and mother had thought he went out to the barn.

While Virgil was gone teacher and some of the children went out to the barn and gave the horses something to eat.

After that we started to play games. The light was turned low and the blinds were pulled down, then we played quite a few games before we ate our supper. For supper we had half a box of crackers and some water, for we had brought some that day. We kept playing games till it was quite late, then we were getting too sleepy. Just then some of our neighbors came and took us home. We had some more supper at our neighbors. After a while they took us to our own homes. Some of the people that lived far away stayed at our place and some at our neighbors.

On the farm we have a dog, two cats, seven mules, ten horses, two calves, two cows. We have a section and a half of land. We came from the United States five years ago. I think I will close and leave room for someone else. I would like to get a book, but I don t think I will because I was in a hurry and did not write very good. I remain, your cousin —Marion Bailey, age 11.

Hayfield Station, Man.

Dear Cousin Doris:—This is the first time I have ever written to your paper. We live in Manitoba and there are two stations near us. One station is three miles away and the other station is a mile and a half away from us.

We have two little kittens. My sister and I go to school and sometimes we have to walk and we get very tired.

I have an older brother. He is nineteen.

We have a pony and her name is Spotty. I hope we will be able to drive her to school next summer.

My father is getting a new house built. And I hope we shall get in it before the winter comes.

In the winter we go sleigh riding.

Well I think I will close now. Yours sincerely—Alice Hopwood, age 10 years.

Pierson, Man.

Dear Cousin Doris:—I have been reading your paper for quite a while and I thought I would write and tell a game. Once when I lived in England I learnt the following game at a party. Only two girls know the secret. One of them goes out of the room, and the other one asks somebody which picture they like best in the room. She has a stick in her hand and points to the pictures, saying, which picture do you like best, this—this—this—or that. The girl tells the one with the stick, and then the girl outside is called in. Now, said the girl with the stick, which is the picture that this girl likes best. Is it this—that—this—or this. The other girl points out the picture correctly. The girls who are not in the secret wonder how she can tell, but here it is. These two girls had arranged before-hand that the picture which had been chosen, should be distinguished by the word, "that. All the other pictures were called, "this, but the picture chosen was called, "that. I would like to see this letter in print, and also to receive a book. I remain your faithful cousin—Vera Coles.

Dear Cousin Doris:—As I seen a lot of other little girls writing to you I thought I would.

I will tell you about the winter. We are having cold weather down where we live.

I have three brothers and four sisters. My baby sister's name is Laura.

My papa has one horse and some cows.

My sister and my brother and myself went to school last summer. Our teacher's name was Miss S. My studies were reading, spelling, arithmetic and writing. Our school opened March first.

I will be nine years old the eighteenth of March.

I have an aunt in town and my brother was there a few days and he liked it fine.

At Christmas I got a nice dress. I liked it very much.

For pets I have two cats, one's name is Spottie and the other's name is Whitie. We have two dogs. Their names are Sport and Bruce.

I think my letter is long enough so I will close, wishing the club very success. —Mabel Dodge.

Stoughton, Sask.

Dear Cousin Doris:—This is my first leiter to the girls cozy corner. My studies are writing, speling and drawing. I am seven years old. We walk two miles to school in the summer and I like it fine. I started last summer. It is storming. My brother was in town for a few weeks. It was nice today but it is storming now. I will be eight years old on October thirteenth. We have one little calf, we have two dogs and two cats and six pigs and one horse. My sister and brother and I go to school in the summer. We go on our bare feet in the summer. My teacher gave me a bible from Sunday school. So I think I will close. So good-by.—Edna Dorothy Dodge.

THE Canadian Boy's Camp

Dear Campers:—Last month I told you that the girls were ahead. They are not this time because the boys bravely came to the front. I have had a hard time to award the prize this month as the letters are so good. Let us keep up our record next month. Sincerely—Cousin Doris.

BOYS' PRIZE LETTER

Avebury, Sask.

Dear Cousin Doris:—This is my first letter to your club.

I am thirteen years old and weigh one hundred and twenty-five pounds.

I have been trapping this winter. I have caught one hundred and twenty-five musk-rats and fifteen weasels.

We live in a very hilly country. We live two miles from our postoffice and forty-five miles from our station.

My father owns a saw mill.

We live on a nice creek which has lots of fish in it.

I will tell you about a deer hunt two of my brothers had this winter.

It was the third day of December and as it had snowed a light snow the night before my two brothers Robert and Frank thought it would be nice to go for a deer hunt. So they started out about eight o clock to try their luck, each armed with a good rifle.

They had not gone far when they sighted two nice buck deers.

Frank took a quick aim and fired but missed. The deer started off but only went about a quarter of a mile until they stopped.

Robert raised his rifle, took aim and fired. The biggest of the two dropped never to rise again with a bullet through his heart.

By the time Robert had fallen his deer, Frank was taking aim on the other. He took a steady aim and fired, killing the other.

They came home very much pleased over their day's success, and got sleighs and brought home their game.

We got the heads mounted, which were very nice.

I like outdoor sports very much. I know lots of good sports but will tell them in some of my future letters if I see this one in print.

I like to work around the mill. I like to do mechanical work.

I would like to get a book.

Hoping I will see this letter in print, and wishing all the readers a Happy New Year. I will close.—Austin Smythe.

Rouleau, Sask.

Dear Cousin Doris:—This is my first letter to the Boys' Camp. My father has been taking the Canadian Thresherman and Farmer for a long time and I like reading the letters. We live eight miles from Rouleau, eighteen from Regina and ten from Grand Coulee.

We are going to farm two sections and a half this year. We have a threshing outfit, a Reo automobile and are getting a Rumely plowing engine.

We have twenty-eight head of horses, seventeen head of cattle and forty-three pigs.

We built a new barn last fall.

My youngest brother and I have a calf we drive all over. We live four miles from school. My brother and I have two ponies we ride and drive to school.

I am in the fifth book and like going to school fine. The name of our school is Prairie Lily.

We have had a lot of snow this winter. Hoping to see this letter in print I remain, your truly.—John McNurlen, age 15.

Maymont, Sask.

Dear Cousin Doris:—As my brother received a prize book not so very long ago I thought I would try for one too. The name of his book was "With Wolfe in Canada." In this letter I am going to tell you about the pets we have. They are four cats, two dogs and ten pigeons. There are three gray cats and one Maltese one, white with spots on it. One of the gray cats is Tabby, another is Pete, the other Tiger. The Matlese one's Buster. We keep them in the stable. When Buster won't behave we lock him in the oats box. They sit on the horses, oacks to warm their feet. Our dogs are both black and white—biggest dog Rover and the other one Toby. Rover is eight years old. He will play ball or tug-a-war. He likes to go with us when we go for straw, sometimes he will hold the lines in his mouth.

Toby likes to play tug-a-war and tag. They are both good cattle dogs. The pigeons are blue, brown and white, some are spotted. Quite a number of our pigeons got poisoned last year. I hope none of them get poisoned this year. Wishing best of success to your paper, I remain, yours truly—Henry Bohn, aged 10.

Stoughton, Sask.

Dear Cousin Doris:—As I saw so many cousins writing I thought I would join them. I have five sisters and two brothers I go to school in the summer. I am in the fourth grade. I am going to tell you about an acrident that happened last June at school.

One afternoon one of my schoolmates was leading out his horse to water when something frightened him and as his halter shank was a long one and when the horse started to run the boy was at his hind feet then the horse kicked and hit him right in the face. It did not break his nose, but it cut the side of his face.

Another boy harnessed his horse and took him to the closest house. They wrapped him up there and then took him to the doctor in town. They had to drive five miles, when they got to town the doctor was not there so they telephoned to the doctor at the next station. The doctor put several stitches in the wound. He was able to come to school in about a month.

My father is going away some time in February and I will have to do the chores all summer.

My uncle is living in town this winter. I was in town for about two weeks. I like living in town.

We have a tobaggan, we have great time sliding for we live on a hill. There is a big drift along side of our stable. I am ten years old. I would like to get a book. I will close. Wishing the club every success, Arthur E. Dodge.

Francis, Sask.

Dear Cousin Doris:—This is my first letter to the Boys' Camp. I am nine years old. My father has taken the Canadian Thresherman and Farmer for a long time.

My father and mother have gone away on a trip. They took the baby with them. His name is Orville. He is very cute. Every time he sees some one go to the kitchen or the door open he runs right for the kitchen.

One day when my two sisters and I were playing on the straw stack I said, "I am going to make a new track for sliding." I stood on my feet to slide but when I got about half way down I ran on some soft snow and fell over and got snow all over my face. I was pretty cold for a while.

We have a little pony named Jessie. I am afraid to ride her in the winter because she feels gay. We have a dog named Tige. Every time some wolves or wild animals are around he sits on the snow bank and barks at them.

Today when I went down to the barn I saw some snow leaning over the bank I stepped on it and went tumbling down with the snow.

At school when it is stormy us boys play horse with some lines. We have a stick with a shoe string tacked on it for a whip. When it is nice we slide on the snow bank, snowball each other and play games.

We have lots of snow here. It has been 40 degrees below zero this winter. We have storms nearly every day and the banks are nearly as high as the school barn. The school is half a mile from here. I am in the second book.

The new railroad and town are going to be three miles and a half from here. The town is going to be called Lewvan. I would like to get a book. I am your cousin, Kenneth Bailey.

Hodgeville, Sask.

Dear Cousin Doris:—This is my first letter to the Boys' Camp, and hope to see my letter in print. My father takes The Canadian Thresherman and Farmer. I love to read the letters in it. There is no school now. The school will open the first of March and then I will go to school. My teacher's name will be Mr. Jacob Penner. My studies are reading, writing, arithmetic, geography, grammar, Canadian history, drawing, and spelling. I like to go to school. We live two miles from school. The school house is painted white. We live thirty miles from our nearest town. Here we have a very cold and stormy winter. The 28th of Jan. my father went to town for coal, and his nose got badly frozen. We have about eight feet snow in our yard. I spend my evening holidays and Sunday writing, reading and eat. We live on the farm. I like it on the farm very much. I am ten years old. My uncle has a store one mile and a half from our place. I get the cattle in summer. We have one dog and four pigs. My dog is black. I write letters to other boys too. My dog's name is Sport. He is no good for the cattle. I like to work on the farm. I like mechanical work. Last year we sowed 36 acres of wheat, and no oats. We got 284 bushels of wheat. We have 100 acres ready to sow in this year. We are going to plow twenty-five acres with the engine for oats, and I have to disk it. My Uncle Isaac takes the Canadian Thresherman and Farmer. My Uncle Isaac has a brother; his name is Jacob. I wish he would write a letter in the Canadian Thresherman and Farmer too. I like to write letters. My grandpapa has bought a Gasoline Engine and a Cockshutt plow. Our hens did not lay any eggs this winter. A few days ago a gray hen laid an egg. I like fried and cooked eggs very much. I like the eggs so much that I could eat about a half dozen eggs. I wish I could have a little pony so I could ride horse back. I like to ride horse back very much. I am always inside and do not know what to do. Well I will have to close for this time. From yours sincerely, W. Theo. Dyck.

Sedley, Sask.

Dear Cousin Doris:—This is my first letter to your charming club, my father having got the Canadian Thresherman and Farmer last month for the first time, and all like it very much. I read the boys page and like it the best of all. But it seems we boys have neglected writing letters and have let the girls get ahead of us, but I hope next time the boys will be ahead.

Last year was a dry year and most of the people expected little or no crop, but when threshing came, they got far more than they expected, some getting up to 34 bushels per acre.

Last fall was a lot of fog around here and I will tell you of a little incident that happened in one of them.

After church I asked one of my chums if he would call on me in the evening and we would go together over to our neighbor about a mile and a half away, which he did.

The evening turned out foggy, but we did not care for the fog and were going to have our fun anyway, so off we went chattering on the way.

We thought we would ride across the corner of the land—(northeast) instead of following the main road, because it was nearer. So we rode in the direction, not minding much whether we were on the right path or not. After we had ridden for a while, we came (as we thought) to a straw stack which we had to pass on the way. All at once our dogs started to bark. Says my chum to me, "What on earth are your dogs doing here?"

Said I, "I'm sure I don't know."

Just then we came up to the place, and think of our surprise when we came up to one of our granaries on south side of our place. We greatly wondered how we came there for we thought we were going in a straight direction instead of a nice round circle from N.E. to S. (as I found out the next morning). When we knew where we were we laughed at ourselves and took the main road to our friends.

Hoping my letter will not be too long, and to see it in print, I will close, hoping your club every success. I remain, your cousin, Alphons Simon, aged 14.

Treherne

Dear Cousin Doris:—This is my second letter to the Boys' Camp. My brother has taken the Canadian Thresherman and Farmer for three years. I am going to school in Treherne now. I am in the eighth grade and I am going to write on the entrance in July. I go home on Friday night and go back to town on Sunday night. There is a skating rink started here and my brother is learning to skate and is making a good fist of it. There's a lot just learning to skate.

I have a twenty-two and this winter I shot a weasel or two and sold the skins for seventy-five cents apiece and when I got the money for them I bought twenty-two shells with it. I hope to see my letter in print. I would like to change cards with some boys of my age, 14 years. Wishing the club great success, I remain, yours truly, Gordon Gorrie.

Crocus Vale, Sask.

Dear Cousin Doris:—I thought I would write you a letter, as you say the girls are beating the boys.

I am 13 years old and have been in Canada two years and I like it very much.

My father and mother are in England. I have one brother and one sister. They are in England also.

I am working out this winer and I get one dollar a week for cooking for a bachelor and so I have to batch it.

I can ride a pony very well. I herded one hundred and seven head of cattle one summer and horseback some of the time and without a saddle.

My pet is a pig and my uncle calls it Ratty because it has only a very short tail, the rest being frozen off.

There is quite a lot of snow here now. I think I will close as my letter is getting pretty long. Hoping it will skip the W. P. B. I am your cousin, Harry Turner.

Portage la Prairie, Man.

Dear Cousin Doris:—This is my first letter to the Club. I am in the eleventh year. I am going to tell you about the rabbits we caught. My brother set a wolf trap over a rabbit path and dug a hole underneath the path. Then he put the trap in the hole and covered it up. In the morning we went out and a Jack rabbit was in the trap caught by the toe. About two days after I skinned him. Then we ate him. My big brother had a leg to eat at supper. He could not eat it because there was too much flesh on it. I have eight pets. The dog's name is Don. He is a cattle dog. Then I have seven cats, three big ones and four kittens. The first one is grey and white and so is the other. They are big cats and fine cats to catch a mouse. Then the other big cat is black and white. She is a glossy color. Her chin is black with white around it. One of the kittens is like his mother. The mother's name is Susy. The other three are grey. One is named Tiger. We haven't got the others named yet. The two big cats are named John Sam and Sam John. We picked them up on the road. When be brought them home one of them drank poison and made him thin. My brother takes the Canadian Thresherman .I think it is a nice paper. I like to spend my Sundays quietly and I go to church. I go to a country school every day. I am only a half a mile from it. I am seven and a half miles from Portage. I think I will be an engineer. I like machinery. I have two brothers and three sisters. One of my sisters is married, and has a baby. The other two sisters are only little. There used to be eight of us in the family. A brother is dead and so is a sister. We have twenty-six horses, twenty-one head of cattle, about two hundred hens and about forty pigs. I hope I will see my letter in print. I remain, yours truly, Willie Bradley.

Kenville, Man.

Dear Cousin Doris:—This is my first letter to the Canadian boys' camp. My brother takes the Canadian Thresherman and Farmer. I am going to Pretty Valley school. There are not many children going to school, as the roads are too bad. It is about one mile to school but others have to go a lot farther. I see that the girls are beating the boys so I have decided to try and help the boys. The snow is pretty deep here but father says it is better for the fall wheat. We own a lot of hens and they are laying pretty good. It is good fun to throw some meat amongst them and watch them fight over it. I have a lot of pigeons and they look very pretty as they are perched on the house top or barn all in a row.

We have twelve horses, four of which are colts and they are very great pets. Being as the girls are going to beat us or rather have beat us, I think I will try and get a few more boys to join the camp and see if we can't get ahead of the girls. Last year we had five cars of grain and we were drawing it out until Christmas. Yesterday I took a sleigh to school and we had a very good time, and sometimes the sleigh would go for rods after it had reached the bottom of the hill and sometimes it would go off the road and into the snow before we knew it. The fall wheat here was especially good. The river runs in front of the house and we catch a lot of fish in the spring. The way we catch them we stretch some poultry netting across the rapids and the fish get against it and can't get away. I hope I shall see this letter printed. Your friend, Bertie Stringer.

Treherne, Man.

Dear Cousin Doris:—This is my first letter to the Boys' Camp. My brother takes the Canadian Thresherman and I have got very interested in reading both the boys' and girls' letters.

We live on a farm about three miles east of Treherne. I am ten years old. I have about a quarter of a mile to go to school. The name of our school is "East Treherne." There are four girls and seven boys going. I am in the fourth reader. My studies are arithmetic, spelling, geography, history, composition agriculture and reading.

My pets are four horses, two colts, four cats, one dog and a chicken. My dog is twelve years old; his name is "Laddie."

My little brother and I have each a sleigh and we have lots of fun sliding down the snow banks.

My brother trapped three weasels and shot one wolf this winter.

I like to work on the farm. I have harrowed and plowed some this fall and drew wheat to town in threshing time.

Well I will close for this time wishing the Camp every success. Yours sincerely, Willie Delahunt.

The Days of the Week.

The names of the days of the week were derived from Saxon idolatry. The seven chief deities of the Saxons were the Sun, Moon, Tuisco, Woden, Thor, Friga, and Seater. Sunday was dedicated to the Sun, Monday to the Moon, Tuesday was consecrated to Tuisco, a German hero, Wednesday to Woden, or Odin, the god of war, Thursday to Thor, who corresponds to the Roman Jupiter, Friday was consecrated to Friga, mother of the gods, Saturday to Seater, the god who gave safety to his worshippers and fruitfulness to the earth.

Importance of Farm Machinery

Continued from page 30

small shop and a kit of tools, which might consist of a forge, anvil, bench, vice, tongs, cold chisel, punch, hammer, file, set of taps and dies, containing one-quarter, one-half and three-quarter inch taps and dies cutting threads, twelve, fourteen and sixteen threads to the inch, six drills, hand saw, rip saw, six wood bits and brace, smoothing plane, jack plane, four wood chisels, tee square, steel square, compass, calipers and plumb and level; these would make a good outfit for a beginner. Some of these tools might be left out for a time on the start, as they could be added as the student became more expert and found he needed more to carry out his advanced ideas.

The machinery should all be examined and systematically repaired during the idle season. Before the spring work commences overhaul the drill, see that the tires are tight and the shoes or disks in good shape to put in another crop. The shoes might need laying or the disks new axles or washers. The evener might need fixing or the whiffletree a new hook. See if the harrows need new teeth, new hooks or sharpening. The ploughs may need shares sharpened or laid, new bushings in coulters or wheels, axle straightened or new bolts in some part. Before haying and harvest the haying and harvesting machinery should be gone over thoroughly and all bearings, gearing, knives, guards, canvas, chains and, in fact, every part examined. Repair where you can and what cannot be repaired or adjusted do not hesitate to get a new part to replace the old. The rule of systematic repairing holds good in regard to all classes of machinery. What is more annoying to a farmer after he has been cutting wheat for a day or so than to have to stop and get new gearing for his machine, thereby losing a day or more when he is paying his harvest hands forty or fifty dollars a month and his crop is up and shelling in the wind. Every day gained in seeding generally means increased yield in harvest and every day gained in harvest time means money because labor is dear at this season and frost or storms are liable to come at any time, bringing damage or complete destruction to all standing crops.

It is estimated that over $400,000,000 is spent annually in farm machinery and that there is about $2,800,000,000 worth of farms in America; thus we see that the average life of a machine is about seven years. It is also estimated, and quite within reason to, that by proper protection, systematic repairing and frequent application of paint, the life of our machinery could be prolonged at least three years. This extension of life would mean a saving of $120,000,000 annually. This source of saving should receive due consideration. It is folly to strive for greater income by increased production when we are not taking care of nor using to the best advantage what we have at the present time. Many farmers are so busy studying crop rotations, chemistry of the soil, insect pests, balanced rations, co-operation or weather forecasts, that they forget their machinery altogether.

Through the mail we can get the proper proportions from our bacteriological departments for mixing solutions for the prevention of smut; we can send a bug or a fly to our entomologist and get name and remedy, if any; we can get the proportions of different foodstuffs to form a balanced ration from our chemists and a great many other hard facts from the heads of our scientific departments, which facts they have obtained after years of hard study and research along their respective branches but we cannot get our pickling machine repaired through the mail; our spray tank soldered or pump packed; our wind mill bearing babbitted; our gasoline engine started; our feed cutter mended or our binder tensions or duck bill adjusted. No, these machines all have to be studied out by the operator in every specific case. There may be fifty machines of exactly the same type all out of working order and no two with the same trouble.

I do not wish to infer that I want the farmer to forget everything but machinery and become a narrow-minded mechanic but I would like him to give this branch of the equipment its share (which is not a small one) of his study and thought and I am sure he will be amply repaid.

With all the development of special farm machinery, there is still much lack of adaptability in it, resulting from the fact that inventors of farm machinery are often divorced from good farm practice. As a rule farmers do not know the principles of mechanics nor do manufacturers know the principles of farming. Many of the farm machines of today are the result of the inventor's ingenuity rather than the frank effort to meet the actual conditions for the benefit of the farmer. We are not to blame the farmer for this state of affairs but he has got to waken to the fact and demand a remedy. Look at the institutions of higher learning that are turning out men for each manufacturer's particular line of work. These, in some cases, have to serve as apprentices for a time. Is it any more reasonable to suppose that farm machines (working under adverse conditions often) will do any better or more efficient work than manufacturer's machines will do under the care of incompetent operators? It is profitable for the manufacturer to employ skilled machinists; so will it be profitable for the farmer to either employ skilled help or be skilled in farm mechanics himself.

It is clear that Western Canada, in order to maintain her rapid development, will have to keep her

farm machines as far in the lead as they are at present. Because of the growing complexity of machines and the call for more ingenious inventions, better adapted and more efficient machinery this is doing to become a science of just as great importance as any yet established and we as farmers should insist immediately on a means whereby practical farm men can get acquainted with and study machanics that deal especially with farm machinery, and become as much of a specialist along that line as the chemist along his line; also a course for the boys that will enable them to manage and care for these nation builders in an intelligent way, be able to work them to their highest efficiency and prolong their life to the maximum extent.

By Clarence M. James.

In treating this subject of the "The Importance of Farm Machinery Upon the Farm" is a problem which may rise quite a discussion between the farmers of our Western provinces. It would be impossible now-a-days for the farmer to get on without some kind of machinery to aid him in producing his crop to sustain the life of the increasing population of our prosperous cities where they look to the farmer for their daily bread.

The first thing is what is a machine? A definition for a machine is as follows: A machine is a device for applying worg by motion and forces to be used to a great advantage, which has movable parts which may be altered as required.

In showing the importance and necessity of the farm machinery during the busy season of the summer months when the land is being cultivated, the first machines which are used in the spring are the ploughs, discs, harrows and seed drills. In the preparation of the seed, care must be taken that land is in a soft mellow condition and compact so it will hold moisture. When the seedbed is ready then comes the time for seeding. Everybody can realize what an important machine it is for the proper placement of the seed; to have it placed down far enough so it may obtain moisture and make rapid germination, the seeder has shown its importance here. From the style of seeder that was used in olden days sowing broadcast, the seed not being placed deep enough in soil to obtain moisture and in many cases it would not be covered. The seeder of to-day will save grain and also what is sown will result much better.

The next machinery that would come in order is haying machinery, such as mowers, rakes and hay stackers, etc., these being a great improvement on those of the olden days when the farmer used to cut his hay with a scythe and rake it by hand and stack it with a wagon. But nowadays we cut the hay with a mower, rake with horses and stack with stacking machine, this being a much quicker method, three men stacking from twenty to twenty-five tons per day. It would be impossible for a farmer to put enough hay up during the short season for a large herd of stock if he did not have some machinery to help him.

After the time of haying is over, then comes the beautiful golden fall, when all the crops are ripe and are ready to be cut. Then we can hear the hum of the binder from early morn till late in the evening, this being quite a change from the olden days when they had to cut their crop with a cradle and then tie by hand, which was a back-breaking job but nowadays we can hitch four horses on a binder, which will cut and bind the grain at the same time and doing it much quicker, one man being able to cut twenty to twenty-two acres a day. There has also lately been a stooking machine invented which may be attached to the binder and stook the grain at the same time.

After the time of cutting, binding and stooking are over and the grain is left for a week or so to dry, then comes the busy time of threshing; the threshing machine being of great importance in helping the farmer to get his grain carefully and quickly threshed before the bad weather comes. This being quite an improvement on the old way when they used to thresh their grain with a flail or by driving a horse over it on the barn floors. There may be two kinds of engines, the steam and gasoline, when threshing to a large enough extent to have a traction engine. It may be used during the rest of the season in plowing, discing and harrowing. In some cases the engine is used for hauling the grain to market and during the winter months the engine may be used for crushing, cutting, etc. The engine does away with a lot of work which horses are generally used for, thus reducing the amount of money which you would have invested in horses and having to feed them the whole winter, while the majority of the farmers only use two or three team during the winter months, the rest of the horses standing idle. The fuel for the engine does not cost any more than the feed for the horses to do the same amount of work.

Just a few words to show how improvement of the machinery upon the farm has helped the farmers stand higher in the estimatoin of others. Years ago, before machinery came into use, it was considered that the farmer did not need any business education to run a farm; but since the machinery has come into use, it has called upon the farmer to use his head more than his hands. Since machinery has come into use it has been much relief for those in the house, because in olden days when the work in the field had to be done with the hands the people in the house had

to do their share as well as looking after the house but their services are no longer required in the field. From this it may be seen that machinery is of great importance to our Western farmer of to-day in aiding him to receive better results from his crop than those of the previous years.

By F. E. Robertson.

Very few people realize the importance of the development of modern farm machinery and its effect on North America. The success of agricultural pursuits depends originally on the accomplishment of the largest possible result at a minimum cost. The American farmers are the largest users of farm machinery and it is largely because of this that the continent has become the greatest agricultural country.

During the first two hundred years of the early settlement of America there was very little increase in the agricultural products of the country, and as late as 1845 people of the United States did not raise enough wheat for their own bread. With the advent of the steel plow, self-binding harvester and steam threshing machines there was a marked change in the producing power of the American people. The food supply increased from 4.33 bushels of wheat per person in 1845 to 5.5 bushels in 1859 and became as high as ten bushels in 1889. During this same time the population on the farms decreased to eighty per cent. its proportion in 1850 and to thirty-three per cent. in 1900. The farmers of to-day employ less than one-third the labor of the country and produce enough food to support not only themselves but the other sixty-seven per cent. of the population and exported farm products in the year 1904 to the value of nine hundred and sixty million dollars.

Much of this great achievement is, no doubt, due to the fertility of the soil, the intelligence and progressive spirit of the farmers of America, but more is due to the persons who have developed the modern farm implements and machines and have supplied the farmer with tools, thereby enabling them to sell their products of agriculture in the open market of the world in competition with the poorly paid laborers of older countries.

Implements and machinery will be still more important in the future, because it is mainly through them that the farmer can reduce the cost of production. To illustrate this it is only necessary to compare the total length of time required in labor to raise a bushel of wheat in the earlier days with that of later. In 1830 it required three hours to raise a bushel of wheat, while near the end of the nineteenth century it took but ten minutes, thus making a great saving in the cost of labor.

The introduction of the reaper, invented by Cyrus H. MacCormick in 1831, may be said to have been the first important step in modern agriculture. With a machine to harvest the grain rapidly it much increased the acreage sown by each farmer and a demand was thus created for modern farm tools and implements. With the release of labor from the farm due to machinery the railroads of the country took on a new life, which supplied the country with immigration, thus increasing the output of manufactured goods to a great extent.

The farmer of a century ago without the inventions of farm machinery or advantages of railroads, was a peasant who toiled with his hands to make a living for his family. The farmer of to-day is a machine operator who rides on a comfortable spring seat and uses labor-saving inventions to produce commercial crops. By these methods the farmer enjoys a greater average of wealth than any other class of people of equal numbers in the world. The drudgery of former life has been much done away with, his occupation has been raised in the opinion of all people, he is no longer spoken of as the man with the hoe. The hoe has been much displaced by the horse-drawn cultivator. The sickle has been displaced by our modern mower and rake and the old sweat-drawing grain cradle that our grandfathers used is slinking into the backwoods and in its place we have the binders and in some parts of the country, where circumstances and climate permit, we have the grain harvester, which cuts, threshes and even measures the grain in the same operation. Instead of the farmer wearily turning the soil one furrow at a time, he employs the two-furrowed gang plow and on the prosperous plains we find him with the steam or gasoline engine drawing eight or ten plows up the field at once, plowing fifteen or twenty acres a day. By the aid of these implements the farmer is able to cultivate his land, that it may produce the best possible results and get the crop harvested rapidly when it is ripe. The grain produced is also of a much better quality than it was when hand methods were in use, for the reason that the seed can be sown in time in the spring that it may have a chance to ripen before being injured by frost. In earlier days, before the improvement of farm machinery, farmers were often compelled to begin their harvest before the grain was ripe; this resulted in a poor shrunken sample, from which they had to make their flour and after it had been threshed with a flail or by animals tramping over it, as was sometimes done, was scarcely fit for food.

Since machinery has come into use labor on the farm is not despised as it used to be in former days when laborers had to work long hours for very low pay. As late as 1849 common farm laborers were paid at the rate of one hundred and twenty dollars a year, while at the present time men employed on the farm receive from three to four time this amount and can do the work with more comfort and satisfaction. The farm to-day demands broad-minded intelligent men that are capable of handling and operating machinery to the best advantage. Thus we have the surroundings and inhabitants of our country homes much improved.

Packing Pork.

Pack closely in the barrel, first rubbing salt well into all exposed ends of bones, and sprinkle well between each layer, using no brine until forty-eight hours after and then let the brine be strong enough to bear an egg. After six weeks take out the hams and bacon and hang in the smoke house. When warm weather brings danger of flies, smoke a week with hickory chips, avoiding heating the air much. If one has a dark, close smokehouse, as the writer has, the meat can hang in all the summer; otherwise pack in boxes, putting layers of sweet dry hay in between. Long experience has convinced me that this method of packing is preferable to packing in dry salt or ashes. Much lard is injured or spoiled by overheating and burning some portions; the smallest quantity scorched gives a bad flavor to the whole. A bucket of water in the rendering kettle prevents this, if the fire is kept from rising too high around the sides. The water is easily separated at the bottom, if not slowly evaporated off during the rendering. Cutting the leaf, etc., fine with a sharp hatchet or cleaver facilitates the free extraction of the lard.

A Corner in Monuments

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entente. He shone. Out of the deep treasury of his domed head he brought a lavish wealth of humor and intimate anecdotes of the great ones of earth—for he was a famous mixer. He offered thick, black cigars from his private stock; he urged replenished glasses—and took them himself, four or five.

Presently he brought himself up with a round turn. "Oh, by the way! By the way, friend Brainard, I understand you've got a little chunk of real estate, back here amongst the rocks some place, which you want to sell to us. Eh? How much?"

Steve's face became very child-like and earnest. "To sell? Oh, no, it ain't for sale. Somebody's been stringin' you. I hadn't thought of sellin'. I'm reckonin' on livin' there."

The lawyer tipped back his head and bayed deeply, half in scorn and half in diplomatic approval. "I see. Good! What a nice home it'll make, too! Beautiful scenery—fine, dry climate—water only two miles underground — good neighbors—excellent schools and churches, and all the rest—eh? Now let's get to the point: What do you want for a relinquishment of all those advantages?"

Steve's voice was hesitating, deprecating. "I don't—believe—I want to sell out, sir. I'm becomin' plumb attached to it—honest."

"Oh! Then all you really want is to have us take our monument away?"

Shy reluctance enveloped Steve like an atmosphere. "I don't know as I care about it—so much—come to think it over. I'm right sorry I've put you to so much trouble. I wrote too quick. I'd just as soon have the monument stay where she is, because—well, you see, I can use her, right good. I was talkin' with a patent-medicine outfit, down to Cheyenne, and they told me they'd pay me rent every year if I'd let 'em paint a little sign across one side—"

"What's that? What?" For once the colonel's professional mask was slipped all awry; his trained eyes blinked. "Patent-medicine advertising — on our monument? Not in a hundred years!"

"Your monument?" Steve suggested. "Those people said you might want to make trouble about it; but their lawyer, he said it was mine as long as it was fastened on to my land."

"It's a desecration!" the colonel declaimed. "It's a blackmailing hold-up!"

Steve's gentleness was undisturbed. "But I ain't askin' you for no money," he said.

The colonel's full, pink countenance was dripping wet. "Well—well," he stammered; and then it was he who came across with an offer. "See here: You've got a half section of utterly worthless land. Will you take a dollar an acre for it?"

Steve's smile took on a mild pity. "A little old three hundred and twenty? For a monument that cost four million? No; I guess I'll keep her. I hate to be contrary; but it's kind of good sport to own the only one in her class. You see, I never had a corner in monuments before and it sort of appeals to me."

There, there; never mind the ebb and flow of the stormy tide of details. At two o'clock in the morning Steve scrawled his signature upon a relinquishment, in due and approved form, while the weary lawyer counted down upon the table a bewildering mess of bright new bills.

"Four dollars an acre," his tired voice said. "Twelve hundred and eighty dollars. There you are, sir."

I got out of my chair, thinking of bed. Steve too arose; but the lawyer caught him by the arm, drawing him down again.

"No, no, no!" he said. "You stay here with me. Murder! Think what I'm up against. The Limited doesn't go east till tomorrow evening—a whole day in this abandoned pit of desolation! You've played it pretty low down on us, but I rather like your style, young fellow. You've got to stay with me for a while."

I did not see either of them again until I made a quick run for the station, just as the eastbound Limited was pulling out, with the wide lawyer standing on the rear platform.

"Good-by, old man!" he called to Steve. "I've enjoyed your society immensely — tremendously. When you're in Omaha, come and see me."

"Sure!" Steve sung in sturdy answer. "Bet your life!" Then, as the train swung into a livelier clip, slipping swiftly toward the middle distance, he leaned his shoulders against the station wall and with slow, calm deliberation began to roll a cigarette.

"Well," I said, "how does it feel to be a capitalist, anyway?"

With nice precision he ran his moistened tongue along the edge of the paper, folded it neatly down and petted it into finished form; then he found a match, drew it along the leg of his corduroys, and blew out a deep lungful of smoke—all this before he gave a syllable of response.

"Why," he said, his voice level and listless, "it felt pretty fair, as long as it lasted."

"As long as— What's that, Steve!"

He made a sweeping gesture of his arm toward the vanishing train. "There it goes," he declared, a deadly apathy in his tone. "He's got it. Oh, you needn't look so scared; he won it off'n me, fair." Another large, slow smoke cloud "A little game of stud," he explained. Then two more puffs. "Anyway, it took him all day to clean me out."

He dropped the cigarette on the boards, then spat with deliberate aim at the glowing spark.

"Me and my monument!" There was ineffable self-pity, self-scorn, self-contempt in the simple phrase. But that humor could not last. The sure rebound of his elastic temper caught him up and lifted him clear of all sordidness. "Oh, darn a fool anyway!" Then, after a flash of recovering laughter: "It don't matter. A man has to pay full price for his experience, don't he? He don't get it at no bargain sales; that's a cinch. Say, have you got another ten dollars? I'm just goin' to hike back to the ranch and ask 'em won't they please give me my job back again. I'll feel considerable safer on hossback."

The Care and Operation of the Plow with Special Reference to the Soil.

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which may or may not be attached. The chief of these are coulters, gauge wheels, jointers and stubble rods. Coulters are of several kinds known as knife, rolling caster and fin. Each of these have special uses; the knife and fin being used principally on breakers and the rolling and castered rolling on stubble plows. Gauge wheels are found on all sod plows and may or may not be attached to hand plows, their use being, however, confined for the most part to hand plows where they aid the plowman very materially in keeping the depth of the furrow uniform. The jointer is an attachment little used in this country, consisting of a device somewhat like a small plow bottom which is attached in place of a coulter. It takes out a narrow strip at the edge of the furrow next the land and turns it over under the larger furrow, thus serving the double purpose of enabling the furrows to lie flatter and allowing the plow to cover the weeds more completely, as those at the edge are cut away in the jointer furrow. Stubble rods or chains are most useful attachments, being employed for the purpose of dragging, or holding weeds or other growth down until the furrow slice covers them and are used chiefly in summer-fallowing.

The draft of plows, while depending upon the size of the furrow slice, may be increased or diminished according to the manner in which the plows are cared for and operated. The care of a plow consists of housing, painting and repairing. Plows benefit much by being housed and whenever possible they should be put under cover. When this is not possible plows can stand out much better than most implements if well painted each year and the bright parts kept well protected from rust by grease. The principal parts of the plow which require repairing apart from breakages are the share and landside. It is an undoubted fact that a dull, worn share or a worn landside reduces the efficiency and increases the draft of any plow. The share should be kept sharpened and if steel should be laid occasionally. In this respect steel shares are superior to cast ones but of course the extra cost is a consideration. In resharpening steel shares care should be taken that they not only receive the correct temper and are smoothly finished but also that the point be given the proper form. Plow points are made so that the tip is about ⅛ inch by 1/16 inch below the line of the bottom of the landside and this inclination is called the suction of the plow. If not correct the suction will affect the efficiency of the plow. Another part which while not important yet requires care is the beam. The beam is so designed that when the plow bottom is attached to it the point of the share will have a slight lead towards the land and will draw parallel with the surface of the ground. Should the plow be wrenched by catching in a root or stone, the beam is liable to become distorted and the set of the plow will no longer be such as will do satisfactory work and in this case while it is possible to have a smith restore the beam to its original form it is advisable to purchase a new beam.

In operating a plow the draft may be lightened in several ways. It has been estimated that a sod plow with a coulter will draw 20 per cent. lighter than one without. The scouring of the plow too lessens the draft and it is usually within the power of the operator to adjust his plow so that it will "clean." The bearings of wheel plows, as has been said before, must be kept free from dust and well lubricated or they will naturally increase the draft.

The care and operation of a plow in order to obtain the best results in all kinds and conditions of soil is a fascinating and important study to all those who are actively engaged in agriculture and I venture to say there is no other implement upon which so much depends as the plow. To all who are interested in the best methods of operating plows there can be no better opportunity of learning more about the plow than when engaged in that noblest of all professions, the tilling of the soil.

Baker Valve Company Enters Canada

Information is at hand to the effect that the Baker Valve Company have opened up a branch office in Canada.

Their representative informs us that this was necessary on account of their not being able to give the best of service to their many customers by handling the goods from the other side of the line. He informs us that there is a growing demand for their goods in the Canadian West and they felt it was absolutely necessary to locate here.

This arrangement will relieve customers of duty charges and will put the company in a position where they can fill all orders promptly.

Germinating Table of Garden Seeds.

	Days	
Bean	5	10
Beet	7	10
Cabbage	5	10
Carrot	12	18
Cauliflower	5	10
Celery	10	20
Corn	5	8
Cucumber	6	10
Endive	5	10
Lettuce	6	8
Onion	7	10
Pea	6	10
Parsnip	10	20
Pepper	9	14
Radish	3	6
Salsify	7	12
Tomato	6	12
Turnip	4	8

EDITORIAL.

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say to you however, that every name that goes on our list is a subscriber and not a reader, if you will permit us to distinguish between the two. Every name added to our list is one for which we have received a subscription price and the subscriber gets our paper because he wants it. We feel that this is quality circulation. If we did not feel this way about it we would not have spent the above amount of money. There are cheaper ways of getting circulation, but not the circulation of the kind that we want.

There is just another little matter that we would like to touch upon here and that is our guarantee. We have not said much about this, but our subscribers know of it and appreciate it. You will find it always at the head of our editorial page and we have stood by it to the letter whenever called upon to do so. It makes it necessary for us sometimes to choose our advertisers, but at the same time we want every advertiser that carries space with us to feel that his advertisement is going to be kept in the best of company, and that it will not be discredited through some fake.

This has been rather a plain talk. We have had it in mind for a considerable time and now that it is off, all that we ask of you is to think about it. It is not our intention in any way to interfere with the other man who is securing business. The market is a free one and so long as the other fellow gets his business wholly and solely on the merits of his publication we are inclined to pat him on the back for what he gets, but the moment that he chooses to secure that business by discrediting the other fellow we have no other recourse than to brand him as a parasite and not fit to be called a publisher.

Kindness To Animals

Continued from page 75

gives him a pain in his tummy and human being have no cause to assume any airs of superiority if he makes a howl about it.

A pig is only as dirty as his owner compels him to be. Give him a clean place to lie in and he will prove himself the sanitary superior of a cow or horse. His very wallowing in the mire is far from being a dirty habit. It is his method of getting rid of parasites and his efforts are more persistent and efficacious than those of some human specimens of his family. A nice thick coat of sticky mud, allowed to dry and then rubbed off against a post, removes waste secretions and parasites with it and is an efficient cleanser. If some of the listeners at the lectures on the clean handling of milk were put through the operation before being admitted to the lecture room the climate would be more salubrious.

Because a pig is generally placed in circumstances under which it is impossible to keep clean, he is often thought by the ill-informed to be fond or careless of dirt. Because he has nothing to do in a sty but eat and his meals are generally served at too long intervals, when food is seen to approach his insistent and stentorian appeals for the waiters haste cause him to be called greedy. Because there is no opportunity to develop intelligence and no means of making companionships, he has few ways of proving to slack observers or stupid owners how much he does know. With all these disadvantages he has a rather hard time. Blows are about the only notice he gets and in ninety-nine cases out of a hundred he has no knowledge of what he is struck for. Now the striking of an animal without its being able to know for what reason the blow was given is about as foolish an action as could well be suggested—of a piece with a child's going back to kick a stone that tripped him — rather worse, for the child's action does nobody any harm. A blow given an animal without good reason and without the animal knowing for what it is given is a distinct injury to that animal and to the owner.

More upon this subject will appear in another issue.

We are in receipt of information to the ffect that Mr. E. M. Pope, of Watertown, S.D., who for a number of years in the past has been engaged in the manufacture of Thresher Specialties, has passed to the world beyond.

Mr. Pope was engaged in a line of manufacturing that was practically all his own. His goods have been extensively advertised in this magazine and were very well known to many of our readers.

It will doubtless be good news, however, that the business is to be continued and that this popular line of specialties will be still open to the thresher public.

Roads for Everybody

Continued from page 11

face, but is spread over a large area of the foundation, and the thicker the crust, the more uniformly will the load be distributed over the foundation.

Telford Construction,

The character of the foundation should never take the place of proper drainage. The advisability of underground or subdrainage should always be carefully considered where the road is liable to be attacked from beneath by water. In most cases, good subdrains will so dry the foundation out that the macadam construction can be resorted to. Sometimes, however, thorough drainage is difficult or doubtful, and in such cases it is desirable to adopt some heavy construction like the Telford; and, furthermore the difficulty of procuring perfectly solid and reliable roadbeds in many places is often overcome by the use of this system.

In making a Telford road, the surface for the foundation is prepared in the same manner as for a macadam road. A layer of broken stone is then placed on the roadbed from 5 to 8 inches in depth, depending upon the thickness to be given the finished road.

As a rule, this foundation should form about two-thirds of the total thickness of the material. The stone used for the first layer may vary in thickness from two to four inches, and in length from 8 to 12 inches. The thickness of the upper edges of the stones should not exceed 4 inches. They are set by hand on their broadest edges lengthwise across the road, breaking joints as much as possible. All projecting points are then broken off, and the interstices or cracks filled with stone chips, and the whole structure wedged and consolidated into a solid and complete pavement. Upon this pavement layers of broken stones are spread and treated as for a macadam road.

Road Dragging.

In sections where clay roads predominate, a simple apparatus, known as the "King Road Drag," invented by Mr. D. Ward King, of Maitland, Missouri, has produced wonderful results, and its use has resulted in converting some of the worst roads into model turnpikes at a cost of less than $10 a mile. It does not work well in stony country, however. The "good roads" movement is spreading everywhere, and while farmers and automobilists are traditional enemies, in the desire for good roads they meet on common ground.

The Geiser Manufacturing Company, of Waynesboro, Pa., is running its factory to its fullest capacity. Only recently the company received an order for seventy-five straw burning engines for Turkey, given by H. G. Nergerarian, of Bulgaria, on his recent visit here. The order is the largest ever received by the Geiser company.

The Power Problem and the Farmer

Continued from page

They have been able, through the medium of electricity, to utilize the vast water powers of our country in an efficient manner.

Electricity has made possible the development of the steam turbine, or rotary engine, having a unit capacity undreamt of by the builders and users of reciprocating engines.

The invention of the turbine antedates the invention of the reciprocating engine by many centuries, but it has only come into use during the past few years, and electricity has made this possible.

Until the turbine was developed our largest power units had a capacity of only 5,000 k.w.'s, or 6,700 horse power. Our largest power unit of to-day, consisting of turbine-driven generators, have a capacity of 20,000 k.w.'s, or approximately 27,000 horse power.

Imagine, if you can, transmitting from one point mechanical energy equivalent to 30,000 horse power through the medium of gears, belts, pulleys, etc., etc., but take this same energy, convert it into electricity, and the problem is simple. The power of Niagara can now be transmitted hundreds of miles by means of electricity, whereas it could not be utilized at all except in a limited sense, in the absence of electricity.

Where would we be in our cities if we did not have electricity to transport us to and from our work? Think of the congestion in New York city if its traffic was handled by horse-drawn cars. Think of the luxuries which are becoming necessities that our urban population is enjoying in the shape of electric light, electric cooking and heating devices, electric flat-irons, soldering irons, vacuum cleaners, motor driven sewing machines, etc., etc.

If electricity has brought these things to our urban population, why can it not bring them to our rural population? Why should the farmer deny himself the conveniences enjoyed by his brother?

There is no reason for his doing so, and he will avail himself of the opportunities presented when he is brought to a realization of their worth.

There are approximately 71,000 public service corporations distributing electricity to-day, with a total daily output approximating 7,000,000 horse power, and practically all of this power is used within our cities. Does it not seem logical that the same form of energy could be used to advantage, and very largely, in our rural communities? The possibility should at least be investigated, and we repeat again that the agricultural engineer is the best medium through which to conduct this investigation.

We cannot think that our educators are blind to the necessity for a thorough understanding of

the power problem; rather we are convinced that they are anxious to master it, and are prevented from so doing through lack of funds and the sympathy of the men they serve.

The remedy is obvious, and should be immediately applied.

The governing factors of our agricultural colleges, the manufacturers of farm implements and machinery and the manufacturers of power apparatus should combine in an effort to convince the farmer that his own best interests demand the introduction of the power problem into his curriculum.

Once this has been done, appropriations will be granted by means of which the agricultural student can complete his education along lines that will entitle him to style himself an engineer.

Until that time comes the agriculturist will have to content himself with "cut and try" methods; he will have to carry on his operations with crude and inefficient machinery; he will have to secure improvements in this machinery through the slow and costly process of elimination, and will have very little to say about how those improvements are to be brought about.

The manufacturer is doing the best he can, but we cannot logically expect the manufacturer to do it all. If he is left unaided, the farmer will suffer the consequences that result from the ignorance and misdirected efforts of the manufacturers, manifested in crude, cheap, unsuitable machinery and so-called "fool-proof" devices, which are now found in such abundance on the farm.

The farmer should be his own safeguard. Let us unite in an endeavour to convince him of this fact.

Here are a few problems that need solving:

The farmer needs light and power.

He is now using kerosene, gasoline and acetylene as an illuminant, and, as a result, the annual fire loss on the farm is equal to that of the cities.

The invention of the Tungsten lamp offers a safe, cheap, convenient and far superior illuminant, which in itself is an insurance policy of great value.

But if the farmer can get an electric lighting outfit for a few hundred dollars, why not increase that expenditure by a few hundred dollars more and thereby secure power available for operating milking machinery, separators, churns, refrigerating plants, hay hoists, pumps, root cutters, feed grinders, threshing machines, corn shellers, etc., etc., and for his wife electric irons, vacuum cleaners, sewing machines, fans, chafing dishes, etc.?

Assume that he wants to do this, how can it be done with a minimum expenditure?

If the thirty volt lighting system is the best for the purpose—and it has many advantages—is it equally adapted for power application?

Apparently not, because if direct current is used it cannot be economically employed for many reasons that are obvious to the electrical engineer. It cannot be transmitted for any distance for one thing. Thirty volt motors are much more expensive than those of higher potential, for another.

Without going into a detailed discussion on the subject, it appears to the writer that alternating current is best adapted to power applications. It is much more flexible than direct current; it can be transmitted economically to almost any distance desirable; and it has this one great advantage—if the farmer installs his own plant, and later on a public service corporation extends its lines to his vicinity, he can switch over from his isolated plant and benefit through the lower cost of power so obtainable without discarding his motors.

The isolated plant has its very real uses as a pioneer, but its usefulness is past from an economical standpoint with the advent of power from a concentrated source.

Again, refer to the bulletin above mentioned. Man power is estimated to cost approximately 11c. per hour. Animal horse power is estimated to cost approximately 8c. per hour.

An isolated plant can be operated at less than 8c. per horse power, and the depreciation is less.

Central station power is being furnished in our cities at one-third of these costs, and lack of demand is all that prevents these lower costs prevailing in the country.

Another problem:

There is a well-recognized tendency for the farmer to purchase a portable gasoline engine, moving it from place to place.

Later he adds another unit, and keeps it up until he has from six to one dozen such equipments. Can he operate such an outfit as economically as he can central power plant furnishing currents for motors located in the places he needs them? If he can, then he is doing something that our manufacturers find it impossible to do except at a loss.

Another problem:

Which is the more economical? A central stationary power plant or a portable plant, such as is available in the tractor?

Perhaps both are necessary.

We might go on indefinitely, but it would be too much of a tax on your patience, so just one word in conclusion.

All of the possibilities above mentioned are sufficiently practical to warrant immediate study, but beyond these there are possibilities which hold out much promise.

Reference is made to the stimulation of plant life by electricity and the conversion of the airs nitrogen into fertilizer. Investigation of the first possibility is still in its infancy, but when men like Sir Oliver Lodge, Prof. Daniel Berthelot, Prof. Lem-

strom and others give it their endorsement, we are inclined to believe that there may be much in it.

The second possibility is already reaching commercial prominence abroad.

In conclusion, if this paper and a subsequent study of the matter touched upon convince you that the power problem of the agriculturist has been neglected, but warrants study and mastery by the agriculturist himself, then the writer's whole aim has been achieved.

To Ascertain the Weight of Cattle.

Measure the girth close behind the shoulder, and the length from the forepart of the shoulder blade along the back to the bone at the tail, which is in a vertical line with the buttock, both in feet. Multiply the square of the girth, expressed in feet by five times the length, and divide the product by 21; the quotient is the weight, nearly, of the four quarters, in imperial stones of 14 pounds avoirdupoise. For example, if the girth be 7 feet, and the length, 5¼ feet, we shall have 6 x 6 = 36¼ and 5¼ x 5 = 26¼; then 36 x 26¼ = 945, and this divided by 21 gives 45 stones exactly. It is to be observed, however, that in very fat cattle the four quarters will be about one-twentieth more, while in those in a very lean state they will be one-twentieth less than the weight obtained by the rule.

Union Bank of Canada Absorbs United Empire Bank.

The latest move in the strengthening of Canada's financial institutions is the decision to merge the United Empire Bank, whose headquarters have been in Toronto, with the strong Union Bank of Canada, with head office in Quebec.

The United Empire Bank was established in 1906. It has a paid-up capital of a little over half a million, and eighteen branches in Ontario. Though perfectly sound and ably managed, the bank found it difficult to make headway against the natural preference of depositors and business men for its larger and stronger competitors. The directors have, therefore, wisely decided to cast in their lot with the Union Bank of Canada.

This will give the Union Bank assets of over $50,000,000, with more than 220 branches in Canada. As none of the branches of the United Empire Bank, except in Toronto, duplicate those of the Union Bank, they will be continued with practically their present staffs, as Union Bank branches.

The directorate of the United Empire Bank will form an Advisory Board for Ontario of the Union Bank, similar to the Advisory Board at Winnipeg for the Western Provinces, which has worked out so satisfactorily.

Course in Gas Engineering

Continued from page 22

this to be taken up with the ingoing air, after thoroughly stirring. The oil forms a body which causes the graphite to be distributed along the cylinder walls and prevents it being immediately blown out with the exhaust. Care must be used, however, not to use graphite in excess, as it will "ball up" along the cylinder walls and cause leakage past the piston. The particles of graphite gather in the small pores of the cast iron, filling them and form a smooth surface, coated with a very thin film of graphite to be presented to rubbing action.

The writer unqualifiedly recommends the use of graphite for gas engine cylinders, and should any operator give it a fair and impartial trial, and then determine the condition of the piston, rings, and cylinder, he is sure that he will be ready to also recommend its use.

There has recently been placed upon the market by the Acheson Oildag Co., a graphite which overcomes the difficulty referred to in feeding through ordinary lubricators. This graphite is supposed to be in the molecular state and will remain indefinitely suspended in a liquid. For this reason it will not clog lubricators and is the preferable form for gas engine use, as it requires no special apparatus for its application. This graphite may be obtained in the powdered form or mixed with cylinder oil under the trade name of Oildag. The Company will be glad to furnish full particulars upon application.

In many cases there is enough of a leak past the back rings of the piston to allow a small amount of gas to "blow past" and cause the drops of oil from the cylinder lubricator to cling to and blacken the glass of the sight feed, so that the operator is unable to determine the operation of the lubricator. These lubricators are generally supplied with a ball check at the bottom to prevent this, but they usually do not fully accomplish their purpose. This may be remedied by mounting the lubricator on a short piece of pipe three or four inches long.

For other parts of the engine any good lubricating oil may be used, but cylinder oil may be obtained as cheaply as the other oils and is generally used. More has been said on the subject of lubrication than originally intended as the connection between lubrication and compression was under discussion, but the subject is a large and important one and does not come amiss in connection with the proper operation and care of engine.

Note:—The writer of this course would be glad to receive any suggestions as to subjects to be taken up which would be of general interest to readers. He would also be glad to reply to any queries concerning subjects already treated through the columns of this magazine. He may be addressed care of Canadian Thresherman and Farmer.

Conducted for the benefit of Dealers, Threshermen and Farmers who have anything to sell or exchange. Three cents a word for each insertion.

WANTED—A position as fireman on steam plowing outfit. Four seasons' experience in firing. Graduate of The Heath School of Engineering. Herbert L. Binkley, Souris, Man.

WANTED—Persons to grow mushrooms for us in waste space in gardens, yards, sheds or cellars, $15 to $30 per week. Send for illustrated booklet and full particulars. MONTREAL SUPPLY CO'Y, Montreal.

AGENTS—To sell lubricating oils, belts, hose, paint, varnish, to factories, mills, stores, threshers, outside large cities. Exclusive territory to right party. Experience unnecessary. Manufacturer's Oil & Grease Co., Cleveland, O.

FOR SALE—35 H.P. Dbl. Cyl. BUFFALO-PITTS Special Steel Gear Plow Engine; 16 Bottom 16 inch Emerson Gang Plow, with breaker bottoms and with 16 extra stubble bottoms. Outfit came out new in 1910, has been used but one short plowing season and could almost be sold for new. We offer this to close an account for $2500.00 cash. This is a real bargain. Outfit is now located in Western Kansas. M. M. BAKER & CO., Peoria, Ill.

FOR SALE—22-45 H.P. HART-PARR Gasoline Traction Plow Engine, with 8 bottom 14 inch P & O Gang Plow, located in Southeast Missouri. This outfit is in first class working order, has been used but slightly. To clean it up we offer the rig complete for $2,000.00. M. M. BAKER & CO., Peoria, Ill.

FOR SALE—22-45 H.P. Hart-Parr Gasoline Traction Engine; 6 bottom 16 inch Emerson Plow, with extra shares; 30 x 50 Niagara Second Steel Frame Separator, with Russell Gearless Wind Stacker, Steel Feeder and Wagon Loader; located in Northwestern Texas. This is a new outfit bought in 1910 and used but very little; parties have defaulted, and to close the matter up we will sell complete for $2750.00. M. M. BAKER & CO., Peoria, Ill.

FOR SALE—22-45 H.P. HART-PARR Gasoline Kerosene Plowing Engine, now located in Manitoba, near Winnipeg; is in first class condition; has plowed about 1200 acres. To settle up this matter and avoid moving engine will sell for $1500.00 cash. M. M. BAKER & CO., Peoria, Ill.

FOR SALE—10-14 inch Cockshutt independent engine plows breaker bottoms. Only plowed 1500 acres. In good shape. Have no further use for them as Farm is all broken out. Fairview Land Co., Osage, Sask.

ENGINEER—Wants position on a plowing engine. Will be willing to take it on for threshing; have had 3 years experience; can do own repairing. Also graduate of The Heath School of Engineering. Chas. B. McMain. Summerberry, Sask.

FOR SALE OR TRADE FOR GOOD LAND—One 35 H.P. Double Cylinder Steam Engine with 10 Bottom Cockshutt Plow. All in first class shape. Elias Gjertson, Warren, Man.

WANTED—Engine gang six or eight bottoms; must be in good repair. Box 70, Morse, Sask.

COMPLETE PLOWING OUTFIT FOR SALE—45 H.P. Hart-Parr with six-14 in. Cockshutt Engine Gang Plow with Breaker Bottoms. Everything good as new. Only run one season. Price $2500. J. F. Crosby, Hanlan, Man.

160 ACRE FARM FOR SALE OR TRADE—For Traction Plowing outfit. Land is quarter mile from town of Ladysmith., Man. Andrew Desta, Hanlan, Man.

STEAM ENGINEER MACHINIST—Open for position on large ploughing outfit, Ontario certificate, fifteen years' experience, three in West, six building, three travelling machinist, abstainer, and pusher, have Alberta and Saskatchewan applications, papers. W. Z. Bayley, Hamilton, Ont., 35 Smith Ave.

WANTED—To exchange Sawyer & Massey eight horse power, mounted on trucks, complete with bevel jack, sweeps, tumbling rods, etc., for portable gasoline engine small portable steam engine. Will guarantee machine in first class order. A. W. Smith, Lunnford, Alta.

"A SNAP"—FOR SALE—John Deere engine gang, 8 breaker bottoms, 1910 make, in first class condition, broke 300 acres. Apply to Neil Wright, Box 155, Wellwood, Man.

FOR SALE—Acetylene Headlight, new, also good supply of carbide. A. E. Powell, Box 155, Caron, Sask.

BROTHER, accidentally discovered root will cure both tobacco habit and indigestion. Gladly send particulars. H. Stokes, Mohawk, Florida.

ARE YOU GOING TO BE WITH US another year? If so, do not fail to renew your subscription when it expires. For unless renewed this magazine will be positively discontinued when your subscription expires.

CANARIES FOR SALE—A large selection of strong, healthy, vigorous birds, both Western and imported varieties, magnificent songsters. Prices and descriptions on application. C. Symmonds, Druggist, Invermay, Sask.

FOR SALE—One J. I. Case, 20 H.P. Traction Engine, only used a short time in good shape; one 32-54 J. I. Case steel separator in good shape, will sell outfit for $1800.00. Will take stock in part payment or will trade it on a gasoline traction. Apply Box 10, Lauder, Man.

BE AN ENGINEER—The Heath School of Traction Engineering (by correspondence) offers you a thoroughly practical course in Traction and Stationary Steam Engineering for spare time home study. Send for prospectus and full information to E. H. Heath Co., Limited, Winnipeg.

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EXPERIENCED ENGINEER desires position. I am an experienced Traction Engineer, Plowman, and Thresherman, and hold License for Saskatchewan and Alberta. When replying please state make and size of outfit, and wages offered. Address —Chas. A. D. Scott, Coultervale, Man.

FOR SALE—One Gould Balance valve for 22 or 25 H. P. Case-Scott engine. J. Reynolds, Yellow Grass, Sask.

WANTED—Position as engineer on steam plowing outfit the coming season in Manitoba or Saskatchewan, or Traction Engine work of any kind. R. H. Hargest, McLean, Sask.

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.

FOR SALE—30 H. P. Flour City gasoline traction engine, price $2400.00, plowed 400 acres. As good as new. For terms, etc., write to Glennie & Rodger, Macdonald, Man.

WANTED—Position as engineer, strictly temperate; have had considerable experience and can furnish references. State wages and make of engine. Address Andrew J. Johnston, Killarney, Man.

FOR SALE—Small separator complete with all attachments. $400 cash. Box 13, Welby, Sask.

WANTED—Position on steam plowing outfit, firing preferred, experienced. Frank Campbell, Marquette, Man.

ENGINE OWNERS write me for terms on refueing and stay bolt repairing I can save you money. I am also open for engagement during the plowing season. Chas. Fenwick, Licensed Engineer, Warella, Sask.

WANTED—Position as engineer on steam plowing outfit, 7 years' experience in Ontario and one in Saskatchewan. Hold a provincial certificate for Saskatchewan. Will take engine through threshing if desired. Address E. F. Sharpe, Maple View, Ontario.

WANTED—Position as Engineer on a steam traction outfit. Fully experienced. Can furnish references. Address J. E. Peatch, Clava, Man.

WANTED—Position on steam threshing engine for fall of 1910. Am a graduate in the Heath School of Engineering. Also a graduate from short course of engineering given by the University of Minnesota. Apply stating wages and kind of engine. Address Ellery S. Post, Woodmore, Man.

ENGINEER—Wants position on engine for threshing, good practical running and shop experience. Diploma from Heath School of Traction Engineering; do own repairs. State size and make of engine. E. Coleman, 46 Kate St., Winnipeg.

FOR SALE—One 4 H.P. Fairbank-Morse Gasoline Engine, in perfect order, complete with all attachments, has been used one week. Owner having no further need of same. Apply The Winnipeg Fur Co., Limited, 181 Bannatyne Ave., East.

MACHINIST—Engineer with certificate for Saskatchewan and Manitoba and experienced with American Abel Engines wants running of engine for threshing season. Write or wire, Alf. Sterne, General Delivery, Winnipeg, Man.

WANTED—Experienced man to run separator, also an engineer for season's threshing. Apply stating experience and wages to W. N. Carney Hazelcliff, Sask.

WANTED—By holder of second class certificate position as engineer; have also good knowledge of gasoline engines. Address care of Box 148, Oxbow, Sask.

FOR SALE—22 H.P. Port Huron traction engine, 33x54 Port Huron separator complete with self feeder, high weigher, wind stacker, tank, caboose all in good running order. Easy terms or will exchange for land. S. Plott, Redvers, 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.

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If you are interested in second hand goods, please write and let us know what you want as we are making deals almost every day, and feel sure that we can fix you out with almost anything you want, either in new or second hand goods.

HAUG BROS. & NELLERMOE Co. Ltd. WINNIPEG.

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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, Minn. Apply to Manitoba Bridge and Iron Works, Winnipeg, Man.

FOR SALE

Two four bottom Moline engine gangs with beaker bottoms and extra shares, price, $160.—J. Hansford, Fairlight, Sask.

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Complete Threshing Rig for sale, consisting of 1 Waterloo Manitoba Champion 40x62 separator, with side face blower, Hartley Dakota weigher, Hawkeye feeder, run about 60 days, 1.30 H.P. Buffalo Pitts engine in good shape, also two water tanks, rubber belt, set 6 in. trucks all for $2000, Andrew Parkes, Box 12. Ridgeville, Man.

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We have on hand at present a very full line of Rebuilt and Second-hand Engines and Separators, which we are offering at attractive prices. Write us fully what you are thinking of buying, when we shall be pleased to tell you what we have and quote prices. All our rebuilt goods are sold under same guarantee as new ones and of course are carefully repainted and look exactly like new. If you write us at once we are almost sure to have the size you want.

We also have a thoroughly Rebuilt Saw Mill Outfit consisting of 25 H. P. Saw Mill Engine and Portable Saw Mill with carriage and track complete. Can hardly be distinguished from new goods. Will be sold at a bargain.

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One 25 h. p. direct flue, Simple, heavy gear traction engine.

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Also several others of our own and other makes. We also have several rebuilt separators of our own and other makes.

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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. (Not rebuilt).

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.

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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.

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6 H.P. Fairbanks-Morse.
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5 H.P. Howe Horizontal Engine, formerly used in elevator.
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20—CRANE & ORDWAY, Winnipeg.
21—DEERE, JOHN PLOW CO., Winnipeg, Regina, Calgary, Edmonton, Saskatoon.
22—DE LAVAL SEPARATOR CO., Winnipeg.
3—DURHAM RUBBER CO., Winnipeg.
24—EMPIRE CREAM SEPARATOR CO., Winnipeg.
26—GAAR, SCOTT & CO., Winnipeg, Regina, Calgary.
26½—GAS TRACTION CO., Winnipeg.
27—GRAY-CAMPBELL CO., Winnipeg, Brandon, Moose Jaw, Calgary.
27½—HAMILTON PULVERIZER CO., Winnipeg.
28—HAUG BROS. & NELLERMOE, Winnipeg and Calgary.
29—HARMER IMPLEMENT CO., Winnipeg.
30—HART-PARR CO., Portage la Prairie.
31—HELGESON, H. T., Winnipeg.
32—HERO IMPLEMENT CO., Winnipeg.
33—INTERNATIONAL HARVESTER CO., Winnipeg, Regina, Calgary, Edmonton, Saskatoon, Brandon.
34—LOUDEN HDWE. & SPECIALTY CO., Winnipeg.
35—MANITOBA HAYES PUMP CO. LTD., Morden.
36—MANITOBA IRON WORKS, Winnipeg.
37—MANITOBA WINDMILL & PUMP CO., Brandon.
39—MASSEY-HARRIS CO., Winnipeg, Regina, Calgary, Edmonton, Saskatoon.
40—MAW, JOS. & CO. LTD., Winnipeg.
41—McKENZIE, A. E., Brandon.
42—McLAUGHLIN CARRIAGE CO. Winnipeg.
43—McRAE, ALEX., Winnipeg.
44—MELOTTE CREAM SEPARATOR CO., Winnipeg.
45—NEEPAWA MFG. CO., Neepawa.
46—NICHOLS & SHEPARD CO., Regina, Winnipeg.
47—NORTHWEST THRESHER CO., Brandon.
48—ONTARIO WIND ENGINE & PUMP CO., Winnipeg.
49—PARIS PLOW CO., Winnipeg.
51—PARSONS-HAWKEYE MFG. CO., Winnipeg.
52—PETRIE MFG. CO., Winnipeg, Calgary, Vancouver.
53—RAYMOND MFG. CO., Winnipeg.
54—REEVES & CO., Regina.
54½—REGENT TRACTOR CO., Regina.
55—RENNIE, WM. SEED CO., Winnipeg.
56—RIESBERRY PUMP CO., LTD., Brandon.
57—RUMELY, M. CO., Winnipeg, Calgary, Saskatoon, Regina.
58—SAWYER & MASSEY CO., LTD., Winnipeg.
59—SHARPLES SEPARATOR CO., Winnipeg.
60—STEELE-BRIGGS SEED CO. Winnipeg
61—STEWART & NELSON CO. LTD., Brandon.
62—STEVENS, JOHN & CO., Winnipeg.
62a—STUART, JAMES, ELECTRIC CO., Winnipeg.
62b—SUB-SURFACE PACKER CO., Winnipeg.
63—SYLVESTER MFG. CO., Brandon.
64—TUDHOPE-ANDERSON CO., Winnipeg, Regina, Calgary.
65—VIRDEN MFG. CO., Virden.
66—VULCAN IRON WORKS, Winnipeg.
67—WATERLOO MFG. CO., Winnipeg, Regina.
68—WATEROUS ENGINE WORKS, Winnipeg.
69—WATSON, JNO. MFG. CO., Winnipeg.
70—WHITE, GEO. & SONS, Brandon
71—WINNIPEG RUBBER CO., Winnipeg.
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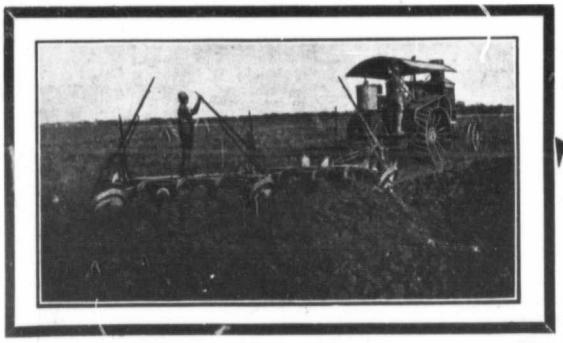
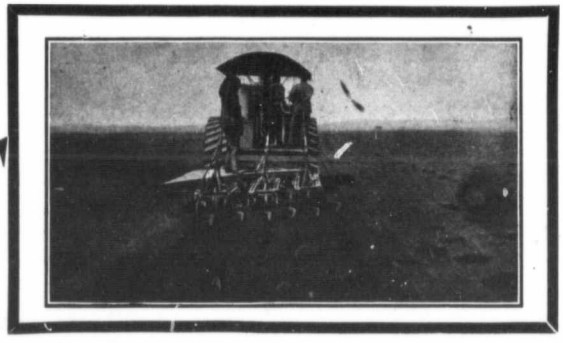
In the shortest possible time is the eternal question among Western farmers—except those who own and operate a

HART-PARR GAS TRACTOR

Recently a gas engine publication in discussing the gas tractor proposition called it "The First Successful Gas Tractor." The term "First" can never be taken away from it and the term "Successful" is backed up by such efficient service rendered thousands of satisfied customers, that it is more than a mere term applied to it by any one or any publication. It is an absolute fact—a fact that is safely entrenched behind years of service and the largest gas tractor factory in the world.





Specifications

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The above is a sample of what the **Hart-Parr Gas Tractor** will do. Its success on thousands of farms has demonstrated that it is more than a substitute for the horse.

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CYLINDERS. Two horizontal cylinders, 10 in. bore, 15 in. stroke. Speed 300 R. P. M. A long stroke, moderate speed motor,—the most efficient kind, and the one that wears longest. Cylinder heads, hemispherical in shape, and cast with the rest of cylinder, hence no packed joints. Valve cages ground to seats,—no packing there.

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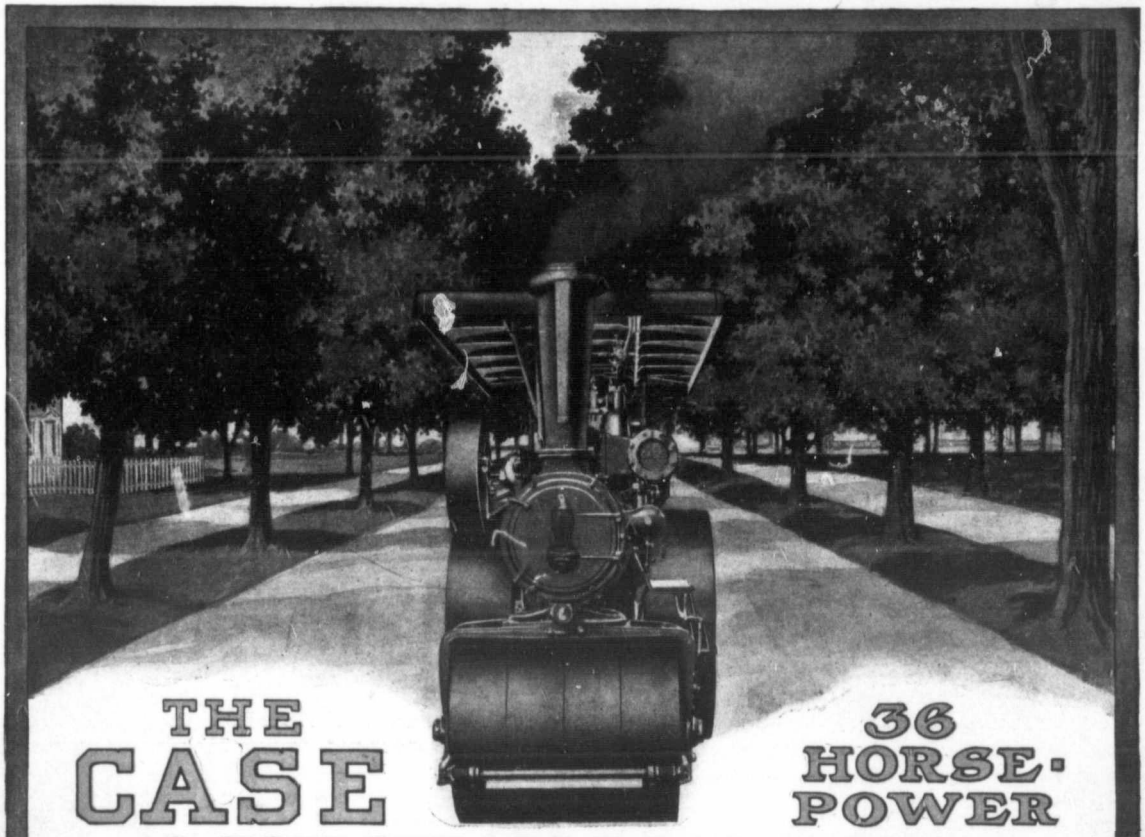

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