

✓ page 2

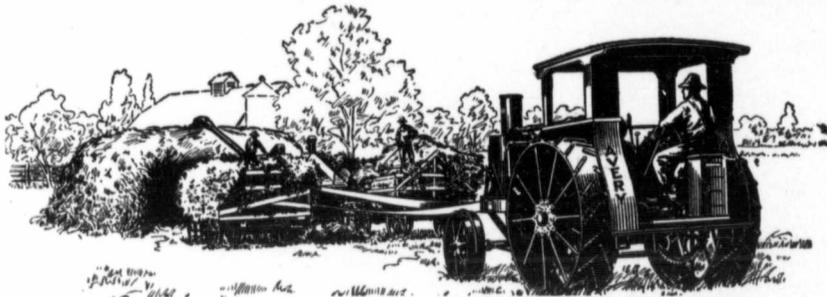
The **CANADIAN** THRESHERMAN AND **FARMER**

WINNIPEG CANADA
JANUARY
NINETEEN SEVENTEEN

BETTER FARMING — BIGGER CROPS — BETTER PRICES



Published Monthly by E. H. HEATH CO. LIMITED — Our Fifteenth Year



The Finest Power Plant On Wheels

There used to be a lot of objections raised to using a Gas and Oil Tractor for threshing and other belt work. But Avery Tractors did away with all the objections. It used to be said that a Tractor wouldn't give steady enough power. But Avery Tractors deliver steadier power even than steam engines. It used to be said that a Tractor had too much vibration. But Avery Tractors are so perfectly balanced that you can stand a nail on its head on the frame while the motor is running full speed. Every objection to using a Tractor for threshing has been cleared away by Avery Tractors.

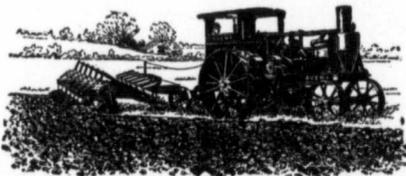
One fine thing about getting an Avery Tractor is that you have power for both Threshing and Farming—all in the one machine. It is possible to do almost every kind of farm work

from preparing the seed bed to hauling the crops to market with an Avery Tractor. In fact a tractor is getting to be practically an all-year-round machine. In the spring you can plow, disc cornstalks, disc and harrow, drill and pack your ground. In the summer you can harvest, thresh, make hay and do road work. In the fall you can cut silage, plow and shred corn. In the winter you can shell, saw, grind feed, do hauling and other work.

When you have a tractor you can also do road work. Tractors are certain to almost entirely supplant horses for such work. Avery Tractors will do grading, leveling and hauling, and, besides this, you can also get a road roller attachment and do road rolling as well.

There's a Size Avery Tractor and Plow for Every Size Farm. There's a Size Avery Thresher for Every Size Run. You can get a Combination Avery Tractor Threshing and Farming Outfit in any one of five sizes:—8—16 H. P. Tractor with 3 Gang Plow and 19 x 30-inch Separator; 12—25 H. P. Tractor with 4 Gang Plow and 22 x 36-inch Separator; 14—36 H. P. Tractor with 5 Gang Plow and 28 x 46-inch Separator; 25—50 H. P. Tractor with 6 Gang Plow and 32 x 54-inch Separator; 40—80 H. P. Tractor with 8-10 Gang Plow and 36 x 60 42 x 64 or 42 x 70-inch Separator.

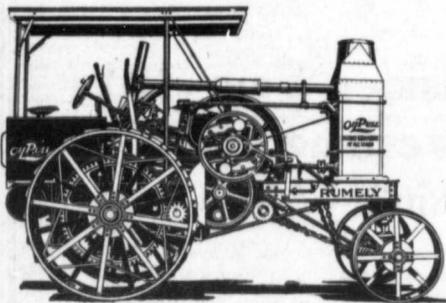
Get ALL the Facts. The New 1917 Avery Catalog has a beautiful photographic cover showing a Tractor Farming and a Tractor Threshing Scene in natural colors. It contains the best illustrations on the inside pages that have ever been shown. It tells you the facts about Avery machines in clear language and in as few words as possible. Write for a copy to-day.



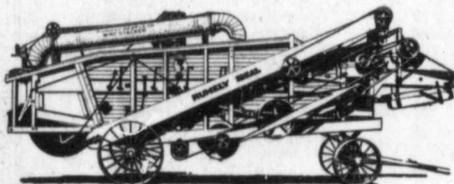
EVERY COMPANY Canadian Avery Co. Ltd.
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Western Canadian Distributors WINNIPEG, REGINA

EVERY

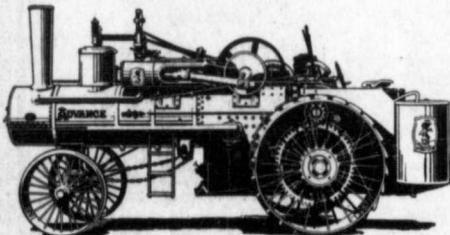
ADVANCE-RUMELY



Rumely OilPull Tractor 15-30 H. P.



Rumely Ideal Separator



Advance Steamer 20 H. P.

THE name "ADVANCE-RUMELY" on a machine is more than an identification—it is absolute assurance of dependability and long service. The leadership of Advance-Rumely outfits has been earned by years of tests under the most adverse conditions—not only in our own shops, but in the hands of threshermen and farmers who have invested their good money and demand the maximum return on their investment.

The Advance-Rumely line of power-farming machinery is standard the world over—made so by men like yourself for whom it has delivered full satisfaction and profits.

Compare the OilPull with ANY Tractor

The Rumely OilPull is the most consistent performer in the tractor field. Mechanically correct in design, its reliability under all working conditions is a source of permanent satisfaction and pride to the owner. Its range of usefulness is unlimited and its operating cost is low. It uses the cheapest obtainable oil for fuel (kerosene, coal oil, distillate, solar oil or "stove tops"). Not only does it use these cheap oil fuels—it uses them as easily and efficiently as tractors of similar type and design use gasoline. The OilPull *cuts fuel costs in half* and is the only tractor sold under this *written* guarantee:

The Rumely OilPull Tractor is Guaranteed to Burn Kerosene at All Loads Under All Conditions

A Separator that Has No Equal

The Rumely "Ideal" is not only a grain saver, but a time saver and best of all, a money maker. It handles any kind of grain regardless of conditions or season—it is quiet in operation, easy to keep in adjustment, well balanced and free from vibration, and for that reason long lived. Its work pleases threshermen and customers alike and it is built in sizes suitable for the biggest jobs as well as the small ones.

Steamers that Meet All Requirements

The Advance-Rumely steam engine line includes sizes and types for every requirement, built on boilers that conform with the latest statute requirements both in the United States and Canada. No steam engines made are more economical in fuel and water consumption, or of greater capacity.

Reliability Backed by Service

Next in importance to reliability in a machine is the service that goes with it. Advance-Rumely Service is practically at your door. We maintain branch offices and warehouses at convenient centers where stocks of machinery and a full line of repairs are available for immediate shipment. Besides this, is the cooperation of a competent branch organization at your service.

Our 1917 catalog is just out—it covers the full Advance-Rumely line of threshing machinery, tractors and other power-farming machines. Just ask our nearest branch for a copy.



ADVANCE-RUMELY THRESHER CO.

(Incorporated)

La Porte

Indiana

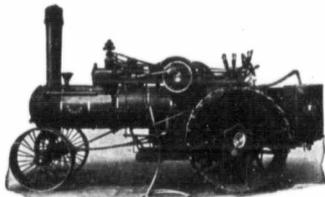
Aberdeen, S. D.	Dallas, Tex.	Lincoln, Nebr.	Peoria, Ill.	Calgary, Alta.
Battle Creek, Mich.	Des Moines, Iowa	Madison, Wis.	Portland, Ore.	Saskatoon, Sask.
Billings, Mont.	Fargo, N. D.	Minneapolis, Minn.	San Francisco, Cal.	Regina, Sask.
Columbus, Ohio	Indianapolis, Ind.	Nashville, Tenn.	Spokane, Wash.	Winnipeg, Man.
Crowley, La.	Kansas City, Mo.	New Orleans, La.	Wichita, Kans.	



Now is the Time to Consider Your 1917 Requirements in Threshing and Plowing Machinery

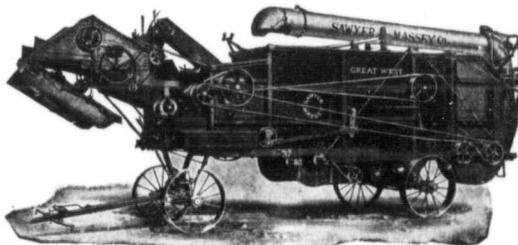
You as a thresherman or farmer have plenty of time at this season of the year to consider your requirements and investigate what the market has to offer. A tractor or threshing outfit is not a thing to be purchased in a hurry.

The Sawyer-Massey Co. invites your investigation. We want you to look over a line that is complete in every particular. It includes a range of sizes in both tractors and separators that will satisfy every demand. Particularly do we want you to investigate our line of light tractors for 1917.



STEAM TRACTORS
(High Pressure Boilers)

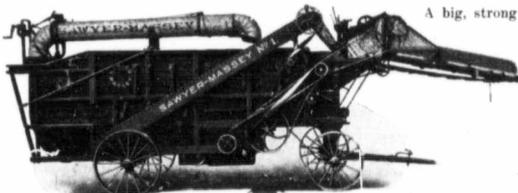
C3—22 h.p. Draw Bar
C5—25 h.p. Draw Bar



GREAT WEST

32-inch cylinder by 56-inch body. 36-inch cylinder by 60-inch body.
40-inch cylinder by 64-inch body.

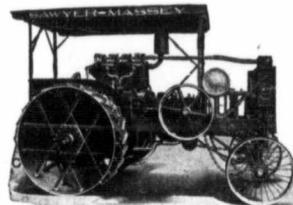
A big, strong thresher; just the machine for heavy work and long runs. Fast, powerful, and economical of power.



SAWYER-MASSEY

Two sizes—20-inch cylinder by 36-inch body, and 28-inch cylinder by 44-inch body.

This separator has only recently been put on the market, but it has been fully tested and proven in actual work. It is full of Sawyer-Massey Quality in every detail.



4-CYLINDER GAS TRACTOR

27-50 h.p., 16-32 h.p., and 10-20 h.p.

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Write for illustrated catalogue, with full details. Catalogues of S-M Steam and Gas Tractors sent on request.

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ALL PRINCIPAL RUSSIAN TRADE CENTRES

SAWYER-MASSEY



Vol. XXII

WINNIPEG, CANADA, JANUARY, 1917

No. 1

THE past season marks a new era in the history of weed control in this province. For the first time every municipality has one or more weed inspectors employed and except in the case of one or two municipalities, each weed inspector devotes his whole time during the growing season to this work. This system has enabled the inspectors generally to do much more thorough work, and no part of the province has been overlooked.

During the summer months some one of the three weeds commissioners has made it his aim to visit each municipality and travel over a portion of the district with the inspector, although in a few cases we have failed to do this. This plan has given us a good opportunity of obtaining a large amount of valuable information regarding local weed conditions at first hand and, besides, we were often able to render timely assistance to the different municipal inspectors at a season of the year when their work was in full operation.

For the first time in the history of this province each municipal weed inspector is required to prepare a report showing the prevalence of weeds on each quarter section and the approximate area devoted to farm crops and summer fallow. One copy of these records will be kept in the municipal offices, and another copy at the office of the weeds commission. These reports will prove exceedingly useful in many ways; first, in checking up the work of the inspectors each year, and besides, it will prove of inestimable value for future reference.

What the Weeds Commission Found This Year

When we took office last year we were well aware that the work

The Weed Problem in Manitoba

Substance of an address by S. A. Bedford, Chairman of Weeds Commission delivered at the Meeting of the Union of Municipalities at Brandon

before us was a difficult one, in fact the biggest problem of the province, but we found the weeds even worse than we expected.

Perennial Sow Thistle—We knew, for instance, that the curse of the province, the perennial sow thistle, was very generally distributed over the Red River Valley, but we have also found it in

throughout the West. It will necessitate that all fields be summer fallowed every third year at least, and these fallows will have to be kept perfectly black all summer and fall. Not a single leaf of the thistle must be permitted to appear above the ground, and even harvesting and threshing operations may have to be suspended to

During an unfavorable season your grain may not germinate above fifty per cent, but every ripe sow thistle seed will grow.

Canada Thistle—This weed is also spreading rapidly in all parts of the province. Perfectly black fallows recommended by us for sow thistle, will also wipe out the Canada thistle, but unless every plant of these two kinds of thistle are absolutely kept below the surface, the summer fallow will prove of very little use, and may even stimulate the thistles to a more active growth.

Couch Grass—This very noxious weed is spreading rapidly, and already I know of several instances where the farmer has been driven off his land from this cause alone. In some instances this land has been sold by a loan company to a good farmer who has cleaned it up and nearly doubled the value of the farm. Some have used a late and heavy seeding of barley for this purpose; others have had excellent results from the cross plowing



NOT A SOIL ROBBER IN SIGHT

(Courtesy of the Man. Dept. of Immigration)

practically every municipality in the province. In some instances as many as a hundred infested fields were found in a municipality located 75 miles west of the Red River Valley, and this weed is spreading in an alarming manner everywhere.

It is a great mistake to suppose that this weed will not thrive outside of the rich soil belt; we found it just as persistent in the rolling prairies of centre and western Manitoba as it is in the neighborhood of Winnipeg, and unless we get full control of it the western part of the province will become just as badly overrun as the eastern portion.

I fear that very few Western farmers realize what it will mean to them if the perennial sow thistle becomes generally distributed

allow the men and teams to work at the fallows. It may mean that in a wet season it will be found impossible to keep these weeds destroyed. Careless farmers, particularly those on rented farms, will allow their land to become breeding places for these weeds, and the seeds will spread from these centres into every portion of the West.

At the present time some of the municipalities have only a few patches of these sow thistles, and now is the time to eradicate this pest before it gets a firm hold. Once firmly established in patches of scrub or bush, along the shores of ponds or streams, nothing you can do will drive them out, and the light downy seed will fly everywhere. We find that every fully matured seed will germinate.

of summer fallows and the dragging of the roots to the surface by means of harrows, narrow toothed cultivators, etc. The first method is most suitable for a wet season and the latter for a dry one.

Russian Thistle—This weed is also spreading rapidly. On light, dry soil it thrives amazingly and becomes a very noxious plant. It has been plentiful adjoining the international boundary for some years, but, much to my surprise, we found it as far north as the municipality of Miniota. It is an annual, and if destroyed before the seeds ripen it can be readily exterminated.

Wild Oats—Where farmers have followed the practice of double disking and skim plowing in the fall all land intended for bar-

Continued on Page 35

THE CANADIAN THRESHERMAN AND FARMER

CANADA'S LEADING AGRICULTURAL MAGAZINE

E. H. HEATH
PRESIDENT
E. W. HAMILTON
MANAGING DIRECTOR
F. C. BRAY
TREASURER



PUBLISHED MONTHLY BY
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EDITOR

J. L. MIDDLETON
CIRCULATION MANAGER

MEMBERS CANADIAN PRESS ASSOCIATION

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Jan.

Taking the College to the Farm

1917

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."

NOT many of our well-informed citizens are aware of the extent to which Western Canada's "improved conditions" is directly due to the extension department of the various agricultural schools and colleges. Even in normal times, the remarkable story of this extension work has barely received its due credit from the press, and since the fall of 1914 it has been all but completely silenced in the noise of high explosives and the finer window dressing of international politics. But if it has been undemonstrative the while, it has not by any means been unproductive, and if the fields could speak and the walls of ten thousand farm homes become articulate, there would be heard a chorus of testimony that the agricultural press could never begin to handle.

A state of war at any time will wreck the finest ideals in a nation's housekeeping, and this world welter at one time and for various reasons did lead to the belief that Canada would be hit in a way that was too horrible to contemplate. In the end,

Canada has experienced a state of prosperity more real and more evenly distributed than anything the past has recorded. A mere "flea-bite" of her arable lands has been used to this end, but those lands were splendidly managed for the greater part and therefore the country's extraordinary revenue for 1916 has been derived, not from borrowings or boosted land values, but from practically no other source than the actual products of the soil, plus the intelligent labor employed in the cultivation of these products.

The part that the Agricultural Colleges in their extension work has had in all this can scarcely be realized till one gets afield and has had the privilege of spending a little while in and around a few of the farm homes in the Prairie Provinces. No matter at what point one gets off, the evidences of this work, particularly among the young people, crops up everywhere. Talk about "National Service!" The young recruits of the boys' and girls' clubs will never have to be corralled by the use of "registration cards." Hundreds of thousands of those little workers have been rendering the very highest service to the Empire without saying a word about it, and were it possible to present a trust-worthy statement of the cumulative effort of those busy bees in one working season, the figures would come out little short of astounding.

In February issue of this magazine will appear a special article dealing with the achievements of the boys and

girls' clubs in Manitoba, but the work of the boys and girls is only one of a many-sided programme of extension work which has been carried out and is being continued with the definite purpose of "reaching the people on their farms and in their homes with at least part of the instruction and inspiration secured by the resident students." This work has been in progress for some time, and now and again we hear of certain of its more spectacular details, particularly during the summer months when the college is sent on wheels to the farming centres in the shape of specially equipped rolling stock provided by the railway companies. All this is seen and fairly well emblazoned in the pages of the daily or weekly papers as the itinerary moves along; what is not seen and is not even guessed at by the average reader is the wonderful spirit, the intensified and permanent interest this propaganda has created—not in isolated spots, but positively throughout the entire area of every township reached.

It is this fact we would seek to bring home to those who ought to know of it and who either have not the means to know or will not bestir themselves to check up the results as we have been at some pains to do, personally, as well as through the testimony of leading agriculturists at selected points whose observations are entitled to unlimited credit. The quality of the instructional staff and lecturers, so far has been of a very high order, and in one or two outstanding instances the men were teachers of more than usual ability. The programme of the "College on Wheels," as well as of the short courses established at several important centres, runs the whole gamut of intensive agriculture and nothing short of "criminal negligence" would characterize the attitude of anyone deliberately failing to take advantage of or seeking to belittle this splendid effort in real statesmanship.

While Canada holds the interest of the "reserve forces" that are represented in the young folks of the farms, she can count on a supply for all future contingencies that would never be raised by forced loans or conscripted service. The power to interest is the magic wand that those men and women of our Colleges and teaching staffs are wielding with a success that is amazing. Without that inborn teaching instinct, all the organization and equipment in the world would be as weak and worthless as gossamer. On paper the college programme is splendid. What we desire to add to this is the unqualified testimony that the rank and file we have seen at work are enthusiasts in the art of kindling the souls of the youngsters.

SUBSCRIPTION RATES

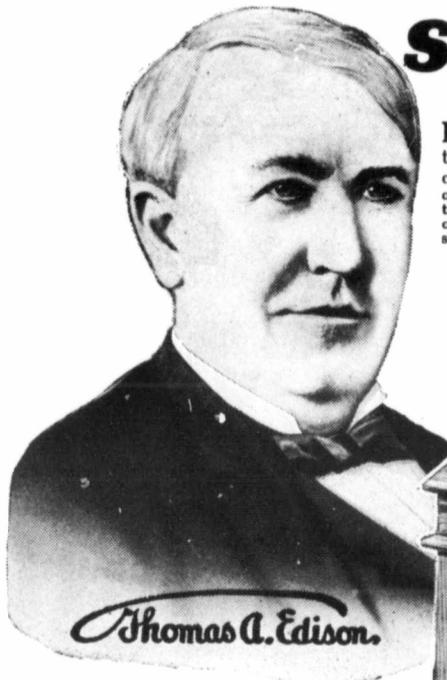
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For years, the world's greatest inventor worked night and day to make the music of the phonograph true to life. At last he has been crowned with success. Just as he was the first to invent the phonograph, so is he the only one who has made phonograph music life-like. And now we make this great, rock-bottom offer on the genuine New Edison, the phonograph invented by Thomas A. Edison. Now that you can get the best on this wonderful offer, you need no longer be satisfied with anything less than Mr. Edison's great instrument. Just read below how easily you may have the genuine New Edison in your home.



Only
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Yes, we will send you the New Edison, the product of the world's greatest inventor's genius, the phonograph with the wonderful diamond stylus reproducer and your choice of the latest Diamond Amberol Records on free trial without a penny down. On this offer, you can now have the genuine Edison, the instrument which gives you real, life-like music, the finest and best of all phonographs at a small fraction of the price asked for imitations of Mr. Edison's great instrument. **Seize this opportunity.** Send the coupon now for free catalog.

A Happy Home

Happiness is life—and real happiness is found only in a real home. And by a real home I do not mean a house with a yard or farm around it. Oh, no! A real home is the place where the happy and united family gather together for mutual enjoyment and recreation. And the Edison makes this possible, for it stands supreme as the greatest home entertainer. It will mean more than entertainment and merriment, more than an hour of amusement, yes, it will mean genuine pleasure of the lasting sort—helpful entertainment and culture of the most beneficial kind. It will mean the family united—a new home.

Rock-Bottom Direct Offer—

If, after free trial, you decide to keep Mr. Edison's superb new instrument, send us only \$1. Pay the balance on easiest kind of monthly payments. Think of it—a \$1 payment, and a few dollars a month to get this wonderful new style outfit—Mr. Edison's great phonograph with the Diamond Stylus reproducer, all the musical results of the highest price outfits—the same Diamond Amberol Records—yes, the greatest value for \$1 down, balance on easiest monthly terms. Convince yourself—free trial first. No money down, no C.O.D., not one cent to pay unless you choose to keep the instrument. Send coupon.



Entertain Your Friends

Get the New Edison in your home on free trial. Entertain your family and friends with the latest up-to-date song hits of the big cities. Laugh until your sides ache at the funniest of funny minstrel shows. Hear the grand old church hymns. Hear the crashing brass bands, the waltzes, the two-steps, the solos, the duets and quartets. You will sit awestruck at the wonderful grand operas as sung by the world's greatest singers. You will be moved by the tender, sweet harmony of quartettes singing those old melodies that you have heard all your life. Take your choice of any kind of entertainment. All on free trial. Then, after the trial, send the outfit back at our expense if you choose. Or keep it on our great rock-bottom offer. **Send the coupon today.**

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Your name and address on a postal or in a letter (or just the coupon) is enough. No obligations in asking for the catalog. Get this offer—while this offer lasts. Fill out the coupon today.

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PREPARING SEED BED

PLOWING



ROLLING



DISKING

IT is in the preparation of the seed bed where the dream of a horseless farm is the nearest to coming true. For all of the fundamental operations of farming, plowing, crushing, rolling, discing, harrowing, the tractor has proven itself to be particularly adaptable. Conditions affect it not at all. Assuming it has the initial power requisite for pulling the number of plow bottoms desired, it will do the work regardless. Untiring, it may be made to work continuously. Both day and night shifts are not unusual on large operations or when weather conditions demand that much work be accomplished in a short period of time. Uncomplaining, it fears no job within the limits of its capacity. Those tasks which have been the most laborious and wearing on both man and horse under past conditions are as child's play to the power and efficiency of the tractor.

It has been the case that plowing, the absolutely fundamental operation in farming, too often could not be done when it should have been done to insure the best results nor even if conditions were otherwise favorable was it always possible to plow in the way desired.

With a tractor of suitable type it will be efficiently done, for it can be done at the most advantageous time, be this early spring, mid-summer, or late fall, whenever experience says it is the best time to plow for the end to be attained. It will break and turn the hardest baked or the most intractable soil, and it will plow deep enough to satisfy the most enthusiastic advocate of deep tillage. There is no condition which the plow must meet which is impossible to the tractor; there is no difficulty blocking the way of the plowman which to it is insuperable.

Likewise the work of the tractor will be expeditious. It can pull so many bottoms, and can work so continuously, and can move so rapidly that more acres may be plowed, and plowed better, within a given time, than is possible by any other method. Of course, enough of men and teams may be put into any field to surpass the performance of any single tractor, but practically and economically this cannot be done. In amount of work done, in quality of work done, in economy of opera-

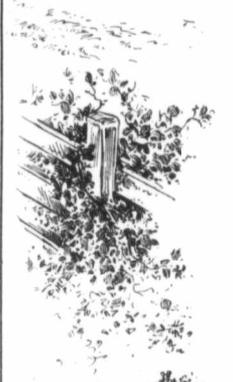
tion, the tractor repeatedly has demonstrated its superiority over any combination of men and horse and plow that can be pitted against it.

And as with plowing, so with the supplementary tillage operations, such as harrowing, pulverizing, discing, clod crushing, rolling and the like. The tractor shows no disinclination to go back over the furrows it has turned, pulling the equipment necessary to pulverize the soil and to fit it for the reception of the seed. But with the tractor it is unnecessary, in a majority of cases, to make repeated trips over the field. On old ground, the sequence of operations, plowing, crushing, pulverizing, harrowing, may be accomplished at one and the same time. Batteries of equipment may be hitched behind the indefatigable iron horse and what was a stubble field becomes a thoroughly prepared seed bed at the one operation.

The tractor will go farther than this even. Not satisfied with the preparation of the seed bed it actually will seed at the same time also, thus covering the entire sequence of operations from plowing the ground to putting in the seed. No other power unit ever in the possession of the farmer can do so much. None ever has attempted it. It would have been impossible. It is thus that the tractor has opened up new possibilities in farming operations and makes those things an everyday occurrence which just a few years ago were not even the substance of dreams.

It is in this province of tractor operation where the horse can be to the greatest extent displaced. That the tractor might supplant the horse has been a favorite surmise and as a possible outcome it has been used as a most powerful argument in favor of the tractor. That the effect of the tractor, generally speaking, has been overestimated in this particular, is doubtless true. The horse has not been, nor can it be, displaced entirely. There are some farming operations for which it is necessary. But in this particular province it very well may come to pass that on every farm where a tractor may be used to economic advantage at all, the horse henceforth will have less and less to do with the preparation of the seed bed.

DRILLING



CORN PLANTING



SMOOTHING





The "HAPPY FARMER" To-day

IS THE FARMER WHO OWNS A "HAPPY FARMER" TRACTOR. THE MANY UNSOLICITED LETTERS OF SPLENDID APPRECIATION WE HAVE RECEIVED CLEARLY AND VERY CONCLUSIVELY DEMONSTRATE THIS.

There are several small and light tractors on the market to-day, yet why is the "HAPPY FARMER" Tractor so generally used and so popular?

This is a question quite worth your while looking into right now and solving to your complete satisfaction. The best and quickest way to do this is to ask the farmer who owns one. He has used his for work in the field and general utility work in and around the yard and can speak FROM EXPERIENCE.

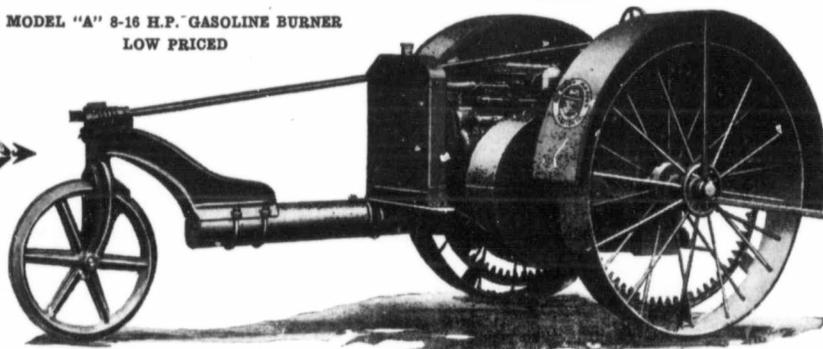
**Don't
Delay**

**DO
IT
NOW**

Then see our dealer in your district or write to us direct. We are only as far removed from you as the time it takes for your letter to reach us, and it is surprising how close this is to you.

Our business is the "HAPPY FARMER" Tractor. Your business is scientific farming—greater production—larger yields—reduction of labor and feed costs—increased profits. We can help you because we have the necessary essentials—Organization—Equipment—Experience—and an All-Purpose Tractor.

MODEL "A" 8-16 H.P. GASOLINE BURNER
LOW PRICED



MODEL "B"
12-24 H.P.
KEROSENE
BURNER

[GREAT
VALUE

THE "HAPPY FARMER" THE ALL-PURPOSE TRACTOR

FOR EFFICIENCY, DURABILITY, ECONOMY, SIMPLICITY—Get the "HAPPY FARMER" Tractor
Good farm labor and horses ARE SCARCE—The "HAPPY FARMER" replaces both.

The "HAPPY FARMER" takes one man only to handle it. Figure out how many hours a year you will require to use it as compared with man and horse power. Make allowance for the additional work IT WILL do each day when working, as against wages and feed bills. NOTICE THE SAVING!

INTERESTING SPECIFICATIONS FOR "HAPPY FARMER" TRACTORS

MODEL "A"

Length—156 inches; width 6 feet; height 66 inches.
Weight—3,500 lbs.; 88 per cent of weight on drive wheels.
Drawbar Pull—1,600 lbs.; 16 h. p. on belt.
Motor—3 cylinder opposed; 5 x 6 1/2 inches; 4 cycle.
Ignition—Atwater-Kent, automatic.
Carburetor—Special Tractor.
Cooling—Water, forced circulation.
Fuel—Gasoline, or kerosene with special attachment.
Transmission—Steel, cut gears; inclosed and running in oil.
Frame—Solid one-piece cast steel, unbreakable.
Drive Wheels—2; 56 inches diameter, 10-inch face.
Guide Wheel—1; 31-inch diameter; self-steering.
Hitch—Our own Universal; no side draft.
Clutch—Expanding, wood shoe.
Crank Shaft—Drop forged, high carbon steel, heat treated, all bearings ground to size. Main bearings 2, 3 1/4 x 2 1/2 inches; pin bearings 2 1/4 x 2 1/2 inches.
Connecting Rods—Drop forged, carbon steel, I beam section, double heat treated. Adjusted by removing plate under crank case.
Cam Shafts—Forged integral with shaft, hardened.
Piston Pin—Hollow, hardened, ground; high-grade steel.
Lubrication—Standard siphon and force feed oiler, large capacity.
Governor—Fly ball type, operating on butterfly valve in manifold; entirely inclosed, lubricated from crank case.
Main Drive Gear—Steel, in 4 sections, interchangeable and easily removable.
Bull Pinions—Roller, cage type, easily removable.
Forward Speed—Two steel gear reductions, all gears except bull gears inclosed and running in oil; reverse—two cut steel gears only.
Levers—2, clutch and reverse, spark and throttle control automatic; brake connected with clutch lever.
Muffler—Integral with frame; most perfect muffler.
Belt Pulley—4 x 11 inches, straight shaft drive, motor speed, 600—800 R.P.M.

If you are visiting Winnipeg during Bonsel and Winter Carnival Week, be sure you see our display of tractors and power lift plows at the Industrial Bureau.

MODEL "B"

Fuel—KEROSENE or DISTILLATE.
Motor—Twin-cylinder horizontal, cast iron block; 4 cycle; overhead valves, 2 1/2 inches diameter.
Bore—5 1/2-inch; stroke 7 inches, speed 750 R.P.M.
Guaranteed Power—Belt, 24 h. p.; drawbar pull, 12 h. p. or 2,000 lbs. at 2 1/4 miles per hour.
Oiling System—Mechanical force feed—6 leads.
Manifold—Special (Patent applied for).
Ignition—Atwater-Kent, Automatic retard and advance.
Carburetor—Special kerosene.
Transmission Gears—Steel cut, spur type.
Final Gears—Roller pinion.
Bearings—Die-cast, reinforced back; crank shaft bearings 2 1/2 x 5 1/2 inches; connecting rod bearings 2 1/2 x 3 1/2 inches.
Tractor Bearings—HYATT ROLLER BEARINGS throughout, in dust-proof cages.
Type of Transmission—Sliding gear, inclosed and running in oil.
Cooling—Circulating pump, radiator and fan; water capacity 9 gallons.
Governor—Fly ball type, with quick adjusting screw for any speed.
Engine Suspension—3-point.
Drive Wheels—2.56-inch diameter, 10-inch face.
Clutch—Band, contracting.
Axles—Rear, live, 2-inch diameter; jack shaft 1 3/4-inch; transmission 1 3/4-inch; crank 2 1/2-inch.
Weight—3,700 lbs.
Drawbar—Swinging type, centre of traction wheels—no side draft.
Frame—One-piece cast steel, unbreakable.
Steering—Automatic, from wheel in furrow; foot brakes on differential enable tractor to turn square corner, right or left.
Fuel Capacity—Kerosene 11 gallons; gasoline 3 gallons.
Muffler—Integral with frame, silent.
Height—72 inches; length 148 inches; width 11 inches.

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Winnipeg, Manitoba



STUDIES IN SMALL TRACTOR DESIGNS

By
W. R. WIGGINS

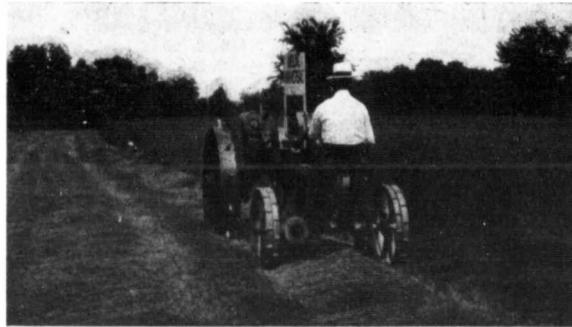
AN investigation of any number of small tractors will impress one with the very wide variation there is in design both in the motor and the tractor mechanism outside the motor. Such a divergence in ideas of what is right has the effect of discouraging a great many farmers from buying. Every small tractor can not be "just right," and because they are so different, one is led to believe that the small tractor is in the stage of development.

From this chaotic state, or lack, of design, will evolve a tractor that will be a composite of all the good points of all the present tractors. Because there are so many different kinds of small machines the field of design will soon be completely covered.

The development of the successful small tractor has been handicapped by a large number of aimless designs. A great many tractors have not been brought out to fill a need, but are the result of some ambitious designer.

calculated from the following well-known formula:

$$BHP = \frac{PLAN}{33000}$$



Tractor with two wheels only, which are also Drive Wheels

Where P = average pressure throughout a working stroke and the average value is 75 pounds per square inch.
L = stroke in feet.
A = area in square inches.

per minute to make one horse power.

Let us assume a single cylinder engine of the following dimen-

great deal for motors is as follows:

$$HP = \frac{D^2 N}{2.5}$$

Where D = diameter in inches.
N = number of cylinders.

This formula is based upon a piston speed of 1,000 feet per minute, which speed prevails in automobile work. The average piston speed for tractors is less. For the motor in question the piston speed is calculated as follows:

The piston travels 18 inches every revolution. 18 inches equals 1½ feet. Then
1½ x 500 RPM = 750 ft. per minute
$$HP = \frac{7^2 \times 1}{2.5} = \frac{49}{2.5} = 19.6 \text{ H.P.}$$

with a piston speed of 1,000 feet per minute.

Reduce this to a piston speed of 750 and we have 14.6, which is 1.8 H.P. less than the formula given first. The second formula is therefore more conservative. These formulas have been given

sions and speed and calculate its power:

L = 9 inches = .75 feet
Diameter of cylinder = 7 inches
A 7 inch diameter has an area of 38.48 square inches.



One Drive Wheel Tractor—Wheel in the Furrow

Designs of this nature differ from good machines in fundamental principles of construction. Such tractors are generally short lived, but the effect on the tractor industry in general, is harmful, and good machines have to overcome an impression left by these poor tractors. One reason for so many different types is that some designers want to get out something "never before offered." The farmer who wishes to buy in the present stage of development, must differentiate between a sane design and a "monstrosity" and assume himself that the tractor will give him service; also that it is backed by a reliable firm.

The most important part of a tractor is its motor. Because of this fact, let us consider motor design first. The actual brake horsepower output of a motor is

N = number of power strokes per minute = one half the number of revolutions for a four cycle engine.
33000 = number of foot lbs.

N = 250 - one half of 500 RPM
$$HP = \frac{75 \times .75 \times 38.84 \times 250}{33000} = 16.4$$

Another formula that is used a



One Drive Wheel Tractor—Wheel on the land

to show the methods of arriving at the fundamental dimensions of a motor, namely, speed, bore and stroke.

A consideration of present day motor design will next be given. A study of eleven two-plow tractors shows the piston speed to be 765 feet per minute and twelve three-plow tractors have a piston speed of 728 feet. Of 37 makes of tractors, 19 have four cylinders, 16 have 2, and 2 have one cylinder. The average speed of the motor on eleven two-plow tractors, was 650 and on the twelve three-plow machines, was 765 R.P.M.

In general, the greater the compression the higher the efficiency of the motor. This can be carried to extremes either way. Present day practice gives a compression

Another Important Advice from McBEAN BROS.

The last letter we issued in this paper was dated September 28th. Since that date wheat has advanced to \$2.00 and oats to 65 cents. The last few weeks' prices have declined, but this is only a natural reaction. We are looking for our wheat to sell at above \$2.00 later on. Oats before another crop is harvested we feel will sell at around 85 cents. There is nothing in the situation to warrant lower prices before another crop is harvested, and even then you need not look for very low prices. We figure that our low grade wheat is entirely too low compared to the higher grades, but these prices will adjust themselves after the beginning of the New Year. We strongly advise farmers not to sell a bushel of their wheat and oats until the beginning of the year, or until wheat is around \$2.00 and oats around 75 cents to 80 cents.

Flax and Barley are fairly high now, but we think both these cereals will go higher.

We are Commission Merchants and would like a share of your grain this year. Give us a trial, ship your grain to Fort William or Port Arthur; advise McBean Bros., Winnipeg, Man., so that we can look after the grading. We make big advances on each car of grain. Write us any time for market information.

December 8th
1916

McBEAN BROS. GRAIN EXCHANGE
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Men who buy tractors these days are paying a great deal more attention to the quality of the tractor than they are to the price. They have been convinced that price is not the only factor to be considered, but that quality is far more important.

The careful buyer to-day, first wants to know whether the tractor in question has abundant power to do his work. He wants to know whether this tractor is going to "balk" for him, by reason of insufficient power, the first time conditions become a little out of the ordinary. Next, he must know whether this tractor is going to be economical in the use of fuel, whether using kerosene or gasoline. And still, he must know more; he wants to know whether the tractor is sturdily built—whether it is going to necessitate an enormous yearly outlay for repairs, besides tying his hands at a time of the year when minutes mean dollars to him. All these things, and more, he must know because they are of vital importance to him.

Last year hundreds of farmers bought Aultman-Taylor Tractor after they had thoroughly investigated the tractor market. This year will see even a greater number buy them—not because the price is low, for Aultman-Taylor Tractors are not in that class, but because the quality, the service, is in them. If you are in need of a tractor and have not investigated the tractor market, let us suggest that you

Put your faith in AULTMAN-TAYLOR and get a Tractor you'll be proud to own

For fifty-two years Aultman-Taylor has been building good farm power machinery. For fifty-two years Aultman-Taylor has stood back of the goods they built. We have not been building tractors for that length of time, but our experience along that line enabled us to build a successful tractor from the start. The first tractor we built, No. 1, is still in successful operation in North Dakota. There's not a question about the lasting qualities of Aultman-Taylor Tractors. Were you to travel the world over, you would not find a better built tractor—neither would you find a tractor that will do so much work on such a small amount of fuel. Aultman-Taylor Tractors are noted for their fuel economy. And when it comes to power, you have never seen one yet that failed in this respect.

Aultman-Taylor Tractors have long established their leadership. In competitive tests—at every kind of work—Aultman-Taylor Tractors have always come out in the lead. Men who are looking for a quality tractor with a record of results back of it, cannot be satisfied with anything other than an Aultman-Taylor. You can buy cheaper tractors, but it is impossible to buy as good tractors. Owners everywhere say this.

Aultman-Taylor Tractors are built in three sizes—a size to fit your farm. You had better write us for catalog and full information to-day, telling us what size you are interested in when we shall be glad to send you full particulars about the size you desire. Do this to-day, for it places you under no obligation and may be the means of saving you a lot of money.

ASK FOR CATALOG AND OTHER LITERATURE—IT'S FREE.

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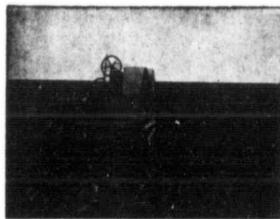
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pressure of 65 pounds per square inch for both gasoline and kerosene. The clearance volume is generally made 32 per cent the displacement of the piston. Where relief valves are supplied with motors for purposes of starting it has been found best to allow 50 per cent of the compression to escape.

According to theory, in order to save fuel, it is best to build motors with the shortest possible stroke and the highest possible rotative speed. In this way, the time of combustion is shortened and expansion is made to the greatest extent. The heat losses resulting from the cooling water, are reduced, because the cooling of a motor depends upon the time of burning the fuel in the cylinder. There are other conditions, however, that do not make it practical to build short stroke motors and the practice of 39 two and three plow tractors is to make the ratio of the stroke to the bore —1.24 to 1. Such a motor would have a cylinder four inches bore,



One Drive Wheel—Wheel in Furrow

five inches stroke. This ratio is made because more decrease in stroke means a decrease in time available for various events, such as intake and exhaust. With a short stroke motor, the mixture is likely to be less uniform, and therefore there will be less complete combustion.

The arrangement of cylinders of 37 makes of small tractors is as follows: 14 are four cylinder vertical, 16 are two cylinder opposed, 2 are two cylinder side by side, 2 are one cylinder, 1 four cylinder opposed, and 1 four cylinder horizontal.

The claim is made that with the vertical cylinder motor, there is less wear on the piston and less loss of compression than with horizontal cylinders. The weight of the piston tends to wear the lower side of the cylinder. While on the other hand, the horizontal cylinder is generally handier to get at and is considerably lower down. The advantage of the single cylinder engine over the multiple cylinder is its simplicity. But the single cylinder opponents argue that the parts have to be made heavier and are considerably more difficult to balance. There are a very few companies making single cylinder tractors, but the companies that are building single cylinder machines

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30 stumps in 100 minutes. Record made by Kirstin Horse Power Puller under official test at the Land Clearing Demonstration of the University of Wisconsin.

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Thousands of Canadian farmers have increased the productive value of their land a hundred-fold by clearing the Kirstin way. You do the same. Stop paying taxes on worthless stump fields; make them earn money for you—get a

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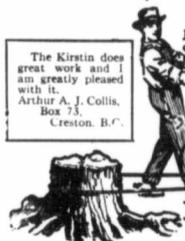
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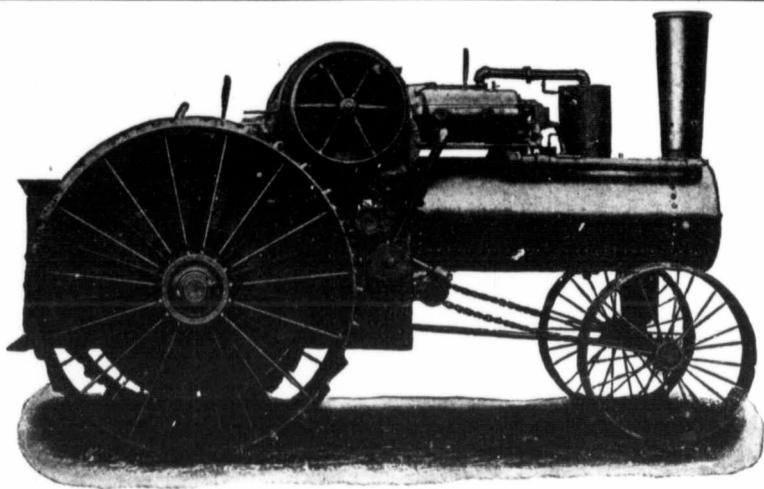
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have a very large proportion of the small tractors that are in operation to-day. The two cylinder opposed engine has the advantage of being well balanced, but has a disadvantage in having a long manifold extending in either direction from the carburetor to the extreme ends of the cylinder. The best results obtain with the carburetor as close to the cylinder as possible. At this writing, it is difficult to say what the tendency in small tractor motor design will really be. Some men in the tractor business believe it will be the automobile type, but that will hardly be as the motor for a tractor will have to be a distinctive design. The problems of the

auto, the truck, and the tractor are entirely different. Each takes a motor of its own. The tractor carries full load 80 per cent of the time; the truck, approximately 40 per cent; and a prominent auto engineer recently told me that the motor in an auto runs at full load less than 10 per cent of the time. The variation in the design of small tractors outside of the motor is very great. Out of 37 different makes I find that 21 have four wheels, with the two rear wheels drivers. This appears to be nearer the standard than any other design and follows large tractor practice. Four makes out of the 37 are three wheels with the two rear wheels drivers. Three

have three wheels with one rear wheel the driver. Three have three wheels with one wheel front. One has two wheels and both are drivers, one has four wheels with one the driver, one has three wheels with one front wheel the driver. What will finally evolve out of these various styles, is very hard to say at this time. Judging from the designs just coming out, that are entirely different from any of these, one would be led to say that standardization in tractors, is a thing of the remote future. The problem of the small tractor has been to do away with side draft while plowing. A large tractor that pulls eight plows will

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cut its own width and does away with side draft. But a small 8-16 tractor pulling two plows will not plow out more than one-third its width. Consequently, there is a pull on one side of the tractor and not in the middle. This has been overcome by some by using high narrow wheels, but this made the machine too high and required a high hitch. A large number of tractors use a single drive wheel in front of the plow; some have this wheel in the furrow and others have it run out on the land. The disadvantage of this plan is that in soft ground, if this one

wheel slips, the tractor is stalled.

A tractor should be capable of developing a maximum draw bar pull equal to 65 per cent of its weight. The average weight of 22 makes of two plow tractors is 4,440 pounds, and the average weight of 20 three plow machines is 5,820. The average pull of a tractor should be considerably less than 65 per cent. To be conservative, one should figure on a load of 1,000 pounds per bottom. It is not often that such a heavy pull will be required, but there are times when it is a good thing to have the power at hand. The usual speeds in miles per hour for small tractors is 2½.

A Strong Rigid Frame

One of the essentials of small tractors is a strong frame. It is subject to extremely severe service and consequently has to be made very rigid. A frame should be riveted very securely, or if not made of built-up construction, should be cast. The vibrations that come on a tractor frame are different from any on any other machine. The vibration is more of a shiver and the combination with the draw bar pull makes the design of a frame very difficult.

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A Two Months' Course in Farm Engineering

WE have much satisfaction in directing attention to the announcement on another page of a two-months' course in farm engineering which will be carried out at Manitoba Agricultural College, Winnipeg, beginning on January 16th.

We believe this is the only course of its kind offered in Canada which covers the various phases of farm engineering, such as steam and gas traction engineering, forge shop, farm mechanics, building construction, concrete construction, farm machinery, etc.

While this course is intended primarily to benefit those wishing to become more proficient in mechanics relating to the farm, the course will also be of value to men who wish to secure a certificate for the purpose of operating stationary steam engines. The course is intended not only for the young men in the country, but for the more mature men on the farm, a large number of whom have attended our engineering courses during the past years.

Object and Scope of the Course

Gas Engine Work.—Gas engine construction, care and operation, stationary and gas tractor work, ignition, combustion, gas engine troubles.

Steam Engines.—Principles, adjustments, valve setting, operation and upkeep, small stationary engines, and steam tractors.

Boilers.—Types, their construction, repair and operation. Flue work.

Forge Shop.—A complete course in forging iron and steel, and in tool steel work, covering such work as drawing out iron, making hoops, eyes, rings, washers, chain links, welding round and flat iron, making and tempering punches, chisels, forging key drifts and calking tools.

Farm Mechanics.—Babbitting, soldering, belt lacing, harness repair, pipe fitting, key fitting, balancing pulleys, gears, taps and discs.

Concrete Construction.—Mixing, proportioning and placing concrete, making concrete tile, side walks and building blocks.

Building Construction.—Framing of farm buildings, laying out rafters, use of carpenter tools, wood shop exercises, saw filing, mixing paint, etc.

Farm Machinery.—Examination and comparison of plows, drills, binders, fanning mills, feed grinders, etc. Talks on the care and operation of the separator.

In addition to the above, lec-

tures will be given in English and Farm Bookkeeping. Inspection trips will be made to several large shops and power plants in Winnipeg.

Since those in charge of this course have their regular teaching with the college students, it will not be possible to complete any one or more parts of the work outlined in less than the full eight weeks of the course.

At the close of the short course, examinations will be given and the student who passes will be given a certificate of attendance, and will be given full credit for the work done, so that, should he desire later to take the regular college course, it will not be necessary for him to take the subjects given in the short course.

Equipment

The large engineering building is well equipped for teaching the work outlined. The blacksmith's shop has forty forges and other necessary tools. The concrete laboratory and wood shop have ample appliances and tools. Models and sectional engines and accessories make it easy for the student to grasp the principles of the important parts of steam and gas engines and boilers. The power machinery laboratory contains four stationary steam engines and a dozen stationary gasoline and kerosene engines, together with gas and steam tractors loaned the college by the various tractor firms.

The students for this course will have the opportunity of living in the splendid college residence. It is well equipped with a large gymnasium, shower baths and swimming tank, so that the life in residence, with the large college library and reading room, offers a fine opportunity for self-improvement along other than engineering lines.

The course will be in charge of Professor L. J. Smith, B.S., professor of agricultural engineering and a first-rate staff of experienced lecturers and assistants. Professor Smith is an enthusiast in his special vocation. He has been engaged as "a whole man to one thing at a time" practically all his life, and that one thing is the science of farm mechanics.

We trust that this unique opportunity will be taken advantage of by a very large number of our readers. We have "stacks" of splendid power machinery, perfect for all practical purposes, but we are still lamentably short of men (and women) who have sufficient skill to run these machines and tools.



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Kerosene Independent Oil Men's Choice of Fuel

THE use of kerosene offers the most hopeful solution of the fuel supply difficulty according to a resolution adopted by the Independent Oil Men's Association, at Chicago, Ill., October 24, and is the result of the report of a committee consisting of Prof. Lucke, head of the engineering department of Columbia University; Prof. Metzler, of the same institution, and M. J. Byrne, Waterbury, Conn. This committee was called the gasoline relief committee and was appointed last April, since when it has examined a large number of devices and now recommends two specifically. One is the Good kerosene carburetor, the invention of John Good, of Brooklyn, and the other the Holley kerosene carburetor.

The Independent Oil Men's Association will arrange to appoint in each large city a special repairman to convert existing cars from gasoline to kerosene burning vehicles and it is stated that the association may even go so far as to finance the repair shop for this purpose. This is sufficient proof that the association is absolutely committed to its resolution and will do everything possible to encourage the use of kerosene.

The convention at which the important resolution was passed is the eighth and was the best which the association has ever had, there being over 800 members present.

Dr. Lucke discussed this subject very fully in a lengthy paper on kerosene devices, which he read at the June meeting of the Society of Automobile Engineers this year. On that occasion he stated very positively that the problem of successfully burning kerosene in an ordinary automobile engine had been solved.

Starts on Kerosene

The Good vaporizer uses a heating device which consists of a very long venturi contained within the exhaust header. This venturi is made as long as the design of the header permits, and mixture is fed to this venturi by an ordinary carburetor. This naturally delivers a very wet and unsatisfactory sort of gas, but this is changed to a warm dry mixture at the far end of the vaporizing tube, whence it is taken directly to the intake header. The intake manifold is arranged directly beneath the exhaust, so that the gas does not have to pass around the cylinders in order to get to the intake valves. Dr. Lucke states that this assembly permits pre-

cisely the same delicacy of throttle control and as good idling as can be had with gasoline. An essential feature is the placing of the throttle between the spray nozzle of the carburetor and the vaporizing venturi. The effect of the throttle is to disturb the nature of the gas and of the heated venturi to remove the effects of such disturbance. One of the main virtues of the Good instrument is the great length of the venturi, because this permits a very high velocity in the front, while it does not cause the great drop of pressure and therefore limit the possibility of cylinder filling.

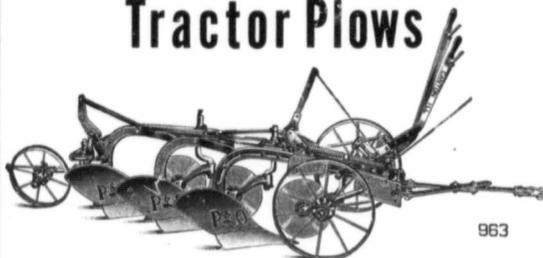
The most interesting feature of the Good system is that it permits an engine to be started up exactly as though it were operating on gasoline. Passing through the intake manifold from end to end is a small tube of thin steel. At the end of this is a burner fed with kerosene sprayed by a small electric blower and ignited by a series of sparks which can be provided either by a magneto or by a battery fitting. Dr. Lucke says that this vaporizing tube will attain a red heat in 15 seconds and when in this condition it will vaporize any mixture reaching the intake manifold to a sufficient extent to enable the engine to be started and to permit it to fire regularly until the main venturi heats up.

The burner operates so quickly that the whole engine and the burner can be started simultaneously. If the engine is cranked with the ordinary self-starter and the blower is in operation simultaneously, the time taken to start is, according to Dr. Lucke, the same as that required for starting with heavy gasoline in cold weather. It is best, however, to arrange to control the blower independently so that it can be started by pressing a button a few seconds before the main engine is cranked. By this means the deposition of kerosene in the intake manifold or in the cylinders is prevented. Dr. Lucke says that with this device there is no smoke and little carbon accumulation and that the operator would never know that he was using kerosene except that in cold weather he would have less starting trouble than he now experiences with gasoline.

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BENDING

Continued from page 40 December issue.

Small sizes of rods may be bent easily by placing them in the hardie hole, or the pritchel hole, of the anvil to the point at which the bend is desired, and bending the end over. Some pieces may be bent by doing the work entirely over the face of the anvil, whereas other pieces are bent over both the horn and the face of the anvil at various stages of the operation.

An Eye Hanger

Suppose that it is desired to form the eye pipe hanger shown



Fig. 5A

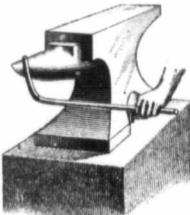


Fig. 5B

in Fig. 5a, to support a pipe 1 1/4 inches in diameter, the eye is to be bent to the form shown, but not welded. A rod 1/2 inch in diameter and slightly over 2 feet long is taken and marked at a distance of 6 inches from one end, this end is then heated to a bright red up to the point marked. The cool end of the rod is grasped with the left hand, and the marked point on the heated end is placed over the farther edge of the face of the anvil, or over the horn near its point. The heated end, which projects, is then bent down so that it points nearly at right angles to the rest of the rod. The rod is then turned on its axis half-way around so that the heated end points up instead of down. The very end of the heated part is then brought down so that it projects slightly over the end of the horn, as shown in Fig. 5b and the end of the rod is bent gradually by light hammer blows into a ring as shown in Fig. 5a.

Forging a Staple

If a staple, like the one shown in Fig. 6a is to be made out of a piece of 1/4 inch round iron, the required length is first marked off

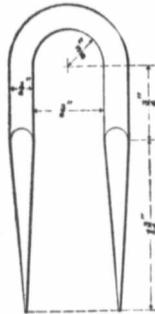


Fig. 6A

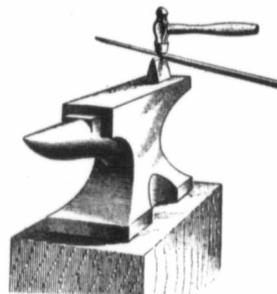


Fig. 6B

on the bar. On this a distance of 1 inch from the end is marked off, and the end is heated and drawn to a square point 1 3/4 inches long. The piece is then cut from the bar, using the hardie as shown in Fig. 6b and making the piece 5 1/2 inches long, over all. The other end is marked and drawn out to a point the same as the first, keeping both squares in line. The piece will now be about 6 1/4 inches long, 1/4 inch round in the middle, with a square tapering point 1 3/4 inches long at each end. The centre of the piece is then marked and heated, and the piece bent over the horn of the anvil to

the shape shown in Cut 6a, making the distance between the two straight parallel ends 3/4 inch. In bending over the horn of the anvil the piece is held against the large

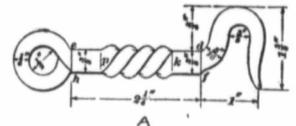
part of the horn and bent by light hammer blows, turning it to keep it round; then while hammering it the piece is gradually brought toward the point of the horn. When bent, the curve should be uniform and the two ends of the same length. If it is warped or twisted, it is flattened on the anvil with the hammer or the flatter.

TWISTING

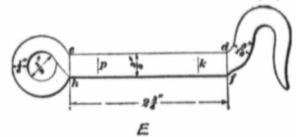
Forging a Gate Hook

If a hook like the one shown in Cut (a) is to be made of 1/2-inch square iron, the operation will be about as follows: It will take

about 4 inches of stock to make the hook, and this length is marked off from the end. It is



then heated and drawn out until it calipers 3/8-inch square, when it will be about 5 1/2 inches long. A length of 1 3/4 inches is then marked off from the end and drawn to a round of 5/16-inch diameter, keeping one side straight as shown at (d), Cut B on page 31. The shoulder (f) is formed over the edge of the anvil, as shown in Cut (c). By striking the upper edge with the hammer, as shown, the top will remain straight at (d), after which it can be finished with the swage to make it perfectly round. A length of 3/4-inch is then marked off on the 5/16-inch end and the point drawn down round, as indicated by the dotted lines, Cut B. The entire piece is then cut off from the bar and the other end of the 3/8-inch square marked off, making the distance between the shoulders 2 3/4 inches, and drawn to 1/4-inch round, as shown in Cut (b), keeping it straight at (e) and forming a shoulder at (h). The 3/4-inch round part is bent into a ring over the horn, and the 5/16-inch round end is bent into the hook as shown in Cut (E).



In bending the hook and the ring the piece is held with one round end projecting over the farther edge of the anvil, and this projecting end is bent back until it has the shape shown in Cut (D). The other end is then bent in this way, and the ring and hook formed over the horn of the anvil by light-hammer blows.

Twisting the Hook

Lengths of 1/2-inch are now marked off on the square part from the shoulders (f) and (h), giving the points (k) and (p) in Cut (E).

The portion between (k) and (p) is then brought to an even

Continued on page 31

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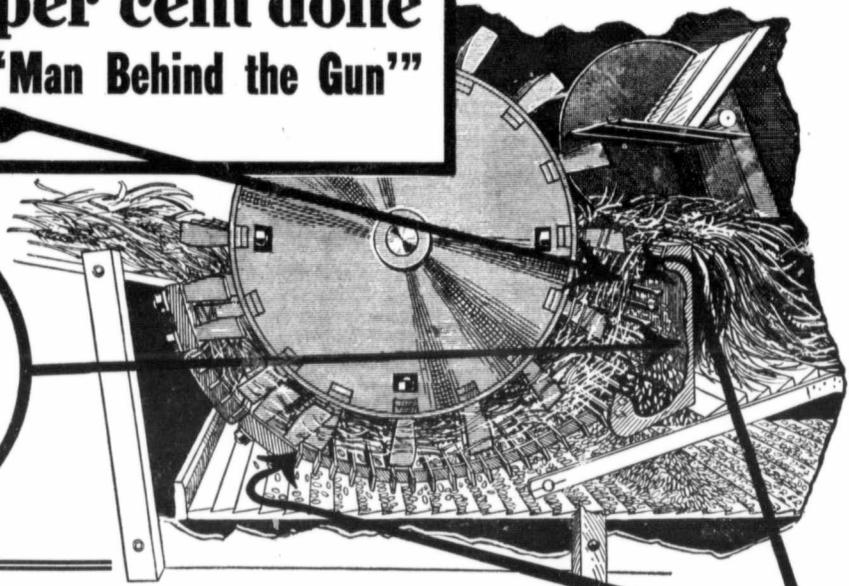
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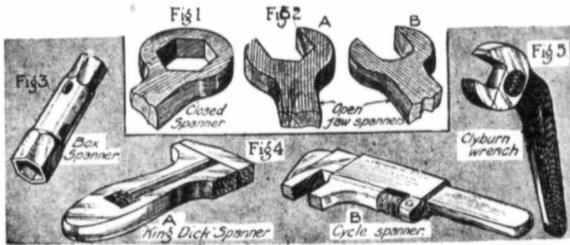
FAMILIAR TOOLS AND THEIR USE
Various Types of Common Tools
 —Application to Ordinary Mechanical Work

AMATEURS are often somewhat hazy as to the proper names of the different kinds of ordinary, everyday tools in use in the machine shop. Spanners, for example, are so familiar as to need no description, yet many do not know the proper names of the various types.

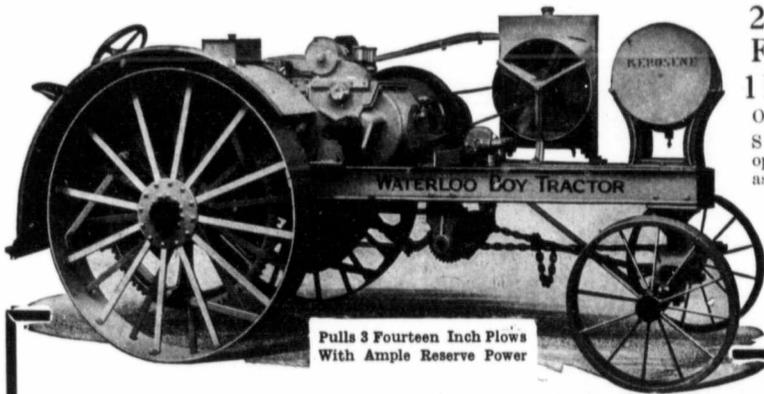
Reference to the illustration will show that Fig. 1 is the closed spanner, found in bicycle bags, and in car work used for the hub caps and some other special large nuts. It has a fine grip of its work, as it meets the nut on all its surfaces, and properly used cannot slip.

The open-ended spanner (Fig. 2) is the one in most frequent use. The type (a) is to be preferred to (b), as it fits the nut on four faces. It is sometimes called a set spanner, and often is made double-ended, fitting two sizes of nut. Small though the difference between (a) and (b) appears, it is felt appreciably when pulling up nuts tightly.

The next sketch (Fig. 3) shows the box spanner, tube spanner, or tubular spanner. Several holes are bored through its body to take a piece of rod, by which it is turned. The rod is called a tommy, or tommy bar. This spanner is as powerful as the closed spanner, and shares with it the distinction of gripping nuts all around. Usually a set of three or four tube spanners fit into one another, with the tommy in the smallest, and make a most compact kit.



The spanners just spoken of are the only ones legitimately worthy of the name as engineering tools, and when available in the proper sizes should invariably be used instead of the makeshifts about to be mentioned. The next type we have to notice is a compromise, and like all compromises it is useful, sometimes indispensable, and never entirely satisfactory. It is the shifting spanner (Fig. 4), so called because one of its jaws shifts so that it accommodates different sizes of nuts. It is sometimes called a screw-hammer, because one end of its jaws is often worked into a sort of hammer head. Both name and



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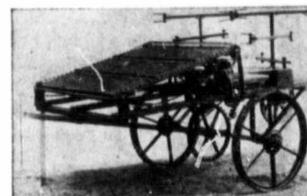
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tool are abhorrent to the skilled engineer—though circumstances often compel its use. There are two broad varieties of the shifting spanner the King Dick type (a) and the light cycle type (b). The King Dick stands up to extraordinarily heavy work. Like the sliding spur gearbox, these spanners are a triumph of prac-

tice over theory. Like the car, too, practically every car has a gearbox of the sliding type—and practically every tool kit has a King Dick spanner.

The light cycle type (b) is a very useful little spanner, provided it be kept for light, small work. In the large sizes, say, 12 and 18 in., it is up to any leverage the ordinary person can exert. But in these sizes it is more a workshop tool than one for the car tool kit.

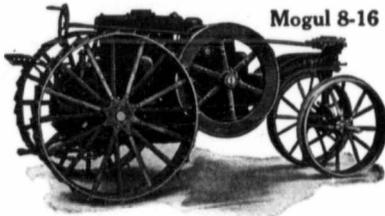
The most useful and expensive type of shifting spanner is the Clyburn. It provides a maximum jaw opening of 1 1/2 in. in the smallest size (Fig. 5). Its shape

enables many inaccessible nuts to be got at.

Nuts and Bolts

Of nuts and bolts there are

two kinds, right-hand thread (Fig. 6) and left-hand thread (Fig. 7), the former being by far the most common. The rule for



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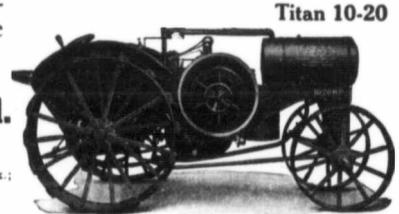
To realize the importance of this feature to you, you must know the comparative local costs of gasoline and kerosene, and the amount of fuel your tractor will probably burn during the season. A small I H C tractor will save you from \$80 to \$100 a year, according to the local difference in the prices of kerosene and gasoline.

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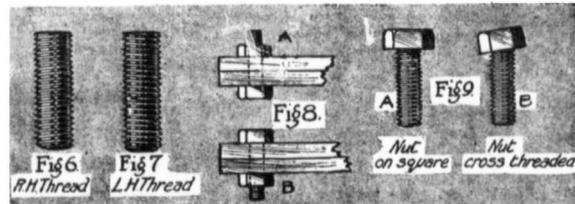
Titan 10-20

knowing which is which is so simple as to be almost worth remembering. With the bolt held up vertically in front of you imagine a small beetle walking up the threads as if they were on a spiral staircase. If the beetle has continually to be turning to his left, it is not a left-hand thread, but a right-hand one, and vice-versa.

On a right-hand thread a nut turned to the right (in the same direction as the hands of a clock) screws itself away from the operator. It is not necessarily tightening the nut, though people have a way of telling you so. Take a nut and bolt holding the sides of a gearbox together, as in Fig. 8. If the worker is operating from above and the nut is at the top, as at (a), turning it to the right tightens it. If the nut is below, as at (b), and the worker is still operating from above, turning to the right loosens it. If the worker is operating from beneath—as in a pit—the conditions are reversed. Under all conditions, when you turn the nut to the right you turn it away from you. This is the clear and correct way of looking at the matter, and if thus remembered there need be no uncertainty when working on tight nuts in awkward positions.

Left-hand threads are used only for special purposes, and in consequence are found only in spe-

cial positions, such as the axle bearing of some wheels, and in some engine parts. For example, in a wheel bearing where the friction of the balls tends to tighten up the cone on which they run when the cone is right-hand thread, a cone with a left-hand thread is used, and the friction tends to loosen it. As it has always a nut at the back to lock it and prevent its loosening, the



friction tends to keep the locked nut and cone tightly together. Were a right-hand cone and nut fitted the friction would tend to work the cone in, away from the lock-nut, and jam the balls and ruin the bearings.

Since left-hand threads work the reverse way from right-hand ones, the rule above mentioned is also reversed; a left-hand nut turned in the same direction as the hands of a clock comes toward the operator.

In putting nuts on bolts, care

should be taken that they are started square, as in Fig. 9a, and not "cross-threaded," as it is called, as shown in Fig. 9b. When cross-threaded they may start easily, and go for nearly a whole turn, and then they almost suddenly become jammed, and can be turned only by an effort even with a long spanner. If the turning be continued the threads get stripped from both nut and

bolt. The experienced man knows by the feel if a nut is going on cross-threaded; and it is not wasted time to make an experiment or two on the matter with an odd nut and bolt until the "feel" of the sudden tightening is learned.

One of the troubles of a beginner is to know how tightly certain nuts should be pulled up. The open-ended spanners are a help here, as the different sizes are made in different lengths giving a suitable leverage for each size of

nut. Speaking generally, a nut on a bolt over $\frac{3}{8}$ in. diameter may be pulled up as tightly as its open-ended spanner will permit, with a steady pull, and using the whole weight of the body. Smaller nuts—say, those on bolts of $\frac{1}{4}$ in.—require a little discretion mixed with the valor, and in all cases brass nuts should not be pulled up so tightly as steel ones. The inexperienced hand is particularly fond of tightening up gasoline unions, and other small parts, with a fierce zeal that he should reserve for really hefty parts. It is a great help to put a little oil on the threads when tightening up a nut.

There is another point that should never be forgotten. When a part such as a detachable head, the sump of an engine, or the halves of a gearbox or axle, has several bolts to secure it in place they should all be put in with the fingers—finger-tight, as it is called—and then pulled up with the spanner successively, half a turn at a time. This way the two parts go together evenly and without strain. It will be necessary to go round the lot six or seven times, perhaps; but it takes no longer, and does not stress the parts unequally. A good case in point is the detachable combustion head fitted with a gasket.

(To be continued.)

Four-Cylinder Engines of To-Day and Their Possibilities

By FINLEY R. PORTER

THE Otto-cycle engine, like most other devices of a basic nature, was really beyond the inventor; he established a point of superiority in motive power but had no conception of the scope of his subject. The early experiments soon established factors that limited the power output of a single cylinder, and made their duplication necessary. The apparent possibilities produced a demand in advance of the art, resulting in more duplication; at the same time attracting the attention of metallurgists and chemists, with the effect that the limiting factors assumed new value. Some of them, as a result of better material and more appropriate accessories being developed, can now be almost entirely disregarded.

To-day, the limiting factors so far as mechanical ability is concerned are very few and as a rule are well understood. The one that comes nearest to determining the possible power output of a single cylinder is the matter of piston areas. The extreme heat conditions that pistons are subjected to limits the area exposed to the amount that can be kept down to the proper temperature by heat flow to the cylinder walls. While this factor varies according to the mean effective pressure, it has been pretty well established at about 16 sq. in., which represents a bore of 4½ in.

Piston speeds are apparently governed by the ability of bearing metal to withstand the inertia forces. While different materials can be employed to decrease these forces, surface friction becomes a considerable factor at high speeds, so that the practical speed has been established at about 3,000 ft. per min. The stroke-bore ratio is purely a matter of choice, but is generally accepted as more conducive to thermal efficiency as it increases; two seems about the limit.

Compression pressure close to the point of pre-ignition is had almost universally when extreme power output is needed. While the volumetric efficiency controls somewhat the possible ratio of clearance to displacement, five is generally accepted, representing a pressure of about 100 pounds gauge.

The mean effective pressure is almost in direct proportion to the volumetric efficiency and is about 40 per cent more than the compression pressure. The brake mean effective pressure varies as the mechanical efficiency and

ranges between 20 to 30 per cent above the compression pressure.

The matter of power impulse per revolution, or torque quality, is not a new subject. Many years of steam practice have established the fact that so far as working ability is concerned, an impulse stroke every 180 deg., or two per revolution, produces an almost perfect power flow. In the four-cylinder engine there is, of course, a power stroke every 180 deg.

Ideal Four-cylinder Engine

Having outlined the factors as we know them to-day let us consider a four-cylinder engine using the specified values, which are not extreme by any means. We can assume the brake mean effective pressure is 120 lbs.; the stroke 0.5 ft.; the area of piston 7.06 sq. in., and the number of power impulses 6,000 per min. Expressed by the usual formula we have

$$\frac{120 \times 0.5 \times 7.06 \times 6,000}{33,000} = 77 \text{ h.p.}$$

a truly remarkable performance when we consider that such an engine complete should weigh about 400 lbs.

This engine applied to the road should be geared about 4 to 1 with a third-speed reduction of 1.33 to 1; second speed 2 to 1, and first speed 3 to 1, making the engine-to-wheel gearing 4, 5.32, 8 and 12 to 1 respectively. Using 34 in. wheels, road speeds from 8 to 70 m.p.h. could be had on direct drive, while third speed would afford a possible range from 4 to 65 m.p.h.

The high mean effective pressure obtained would not permit a wide-open throttle at low speeds with any spark advance, as objectionable and detrimental pounding would result. To safeguard against this abuse a purely mechanical carburetor should be employed, with dimensions that would prohibit a wide-open condition at low engine speeds.

If greater car speeds are desired, especially for the heavier type of vehicle, more power is easily had by changing the stroke-bore ratio, still keeping within the limits of our mean effective pressure and piston speed. This would, however, result in a slight loss of thermal efficiency.

Constructional features are matters of individual taste. To obtain, however, the efficiency outlined, neutral space must be kept to a minimum, which excludes practically all valve types other than overhead or sliding

WHY PAY BIG PRICES IF YOU HAVE CASH ?

Tractors and Portables

LOOK at these for Bargains that cannot be duplicated anywhere.

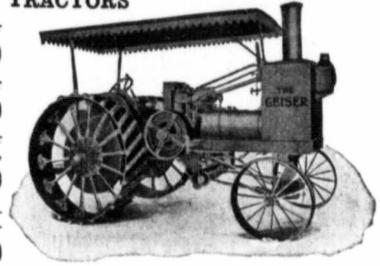
GASOLINE TRACTORS

45 H. P. 4 - Cylinder Tractors (new) Cash \$1500

45 H. P. 4 - Cylinder Tractors (re-built) Cash \$1200

45 H. P. 4 - Cylinder Tractors, second-hand, good order. Cash \$1000

8-16 H.P. Single Cylinder Tractor, Manitoba Universal (rebuilt). Cash \$600



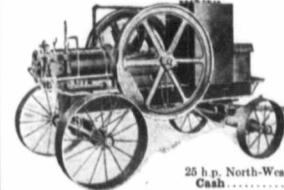
PORTABLE GEISER GASOLINE ENGINES

22 h.p. Single Cylinder, on strong truck (new). Cash \$700

22 h.p. Single Cylinder, on strong truck (rebuild). Cash \$600

20 h.p. Single Cylinder, on strong truck (rebuild). Cash \$500

Also have a couple of 20 and 22 h.p. Portables which will rebuild and sell at about \$300 each.



STEAM TRACTORS

35 H.P. Double Cylinder Geiser (rebuild). Cash \$2000

25 h.p. North-West (rebuild). Cash \$1000

SPECIAL

2 h.p. Farm Engines, slightly used for demonstrating purposes. Each in thorough order at \$37.50 each. Only have five of these. Act quickly, repairs can be had in Winnipeg.

BONSPIEL DEALERS AND FARMERS, CALL TO SEE ME FOR WHAT YOU REQUIRE.

R. S. EWING, 200 Union Trust Bldg., Winnipeg



BEST ANTI-FRICTION BABBITTS ON THE MARKET.

With forty years' experience in manufacturing alloys for all classes of machinery, the HOYT METAL CO. has evolved two alloys which are unsurpassed by anything of the kind now in use.

HOYT'S NICKEL GENUINE Babbitt is especially designed for heavy duty gas tractors.

HOYT'S FROST KING Babbitt is especially designed for threshers, separators and stationary engines of all classes.

If your dealer does not carry these metals in stock, send your order direct to us. In order to insure prompt delivery, send postal money order.

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Less than 25 lbs. 75c per lb.
25 lb. box 70c per lb.
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Less than 30 lbs. 40c per lb.
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There's full generous weight in every ton of the economical, slow-burning KING coal. Place your order now. Prompt delivery guaranteed. Ask for our monthly picture calendar.

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The World's Best In Belting

The last word in quality of raw material and human skill is put into every lineal foot of belting made, or marketed, over our name. We take no risks and indulge in no questionable experiments. We have learned our lesson, and since **character** is fire-proof against all temperatures, we know that the



LION BRAND

RUBBER BELT

AND THE

Yellow Fellow

ENDLESS THRESHER BELT



WILL OUTLAST THE GREATEST STRAIN THAT MAY BE PUT UPON THEM IN MANY YEARS

You can get them from any thresher company doing business in Canada. They cost a little more than other fabrics that are a big risk from the day they are used in any power transmission, but we guarantee our goods against all disappointments from slippage or breaking. They are the "guards" that will never betray their trust under any pressure—at threshing or at any time.

Gutta Percha and Rubber Limited, Not in Any Trust or Combine
Winnipeg Fort William Regina Saskatoon and Calgary

sleeve. Intake gas speeds should be kept below 12,000 ft. per min.; reciprocating parts must be extremely light. The practice outlined is hardly conventional but has often been demonstrated as possible.

In comparing the four-cylinder engine with those of the same displacement but with a greater number of cylinders, the deciding factor is the thermal efficiency. The heat losses represent practically 60 per cent of the total fuel used, and are about equally divided between the losses to the cooling medium and to the exhaust. The cooling medium losses are in proportion to the surface exposed and the heat gradient. Since the surface exposed increases rapidly in relation to the displacement as the cylinder volumes are divided, the heat losses are likewise increased. In addition the mechanical losses, while small, increase in proportion to the number of cylinders. Anything that tends to decrease the thermal efficiency should be considered a step backward. The demand, however, for power output beyond the possibilities of a four-cylinder engine must be met by a greater number of cylinders.

Future Developments

The future, to my mind, will be full of more interesting developments. So far we have simply

spoiled the problem by getting an answer quickly, regardless of its correctness or cost, and I believe you will all agree that the cost has been high.

The question of fuel cost cannot be ignored. Increasing the thermal efficiency is the real problem that demands an answer, not so much as a matter of cost per horse-power as of cost per mile traveled. In order to accomplish any results worth while, the cycle must be changed. The induction stroke must be shortened in relation to the expansion stroke; the initial pressures must be materially increased, and the final pressures decreased.

C. E. Sargent in a paper before the Indiana Section of the S. A. E. sounded the keynote of this advance. While I do not agree with the methods he suggests, the principle aimed at I believe to be correct.

Working temperatures will have to be raised also, and for aeroplane engines I believe direct air-cooling will play an important part in the development.

These problems are going to prove much harder than past developments. To facilitate an answer being had in a reasonable time, I suggest that the engineering societies promote discussions and comparisons of experimental results. This would result in

combined effort and in development worth while.

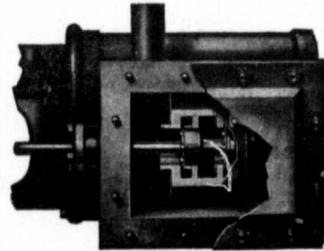
VALVES AND OVER-HEATING

The valves in a gas engine may have much to do with the motor overheating and loss of power. When they leak compression considerable power is lost. They cause heating of the motor when their opening is diminished by the wear at their ends, or in case the push-rod adjustment works loose. The space between the

push-rod and the valve is not lifted sufficiently to allow the hot gases to be driven from the cylinder before the new charge is taken in; consequently the cylinder is heated excessively and a loss of power results. The space between the push-rods and valve stems should be such that when hot a thin sheet of paper will move freely between them. If they are adjusted when cold, there should be a space between them equal to about three thicknesses of paper.

THEY WIN THEIR WAY BECAUSE THEY PAY

The cheapest H.P. you can buy. Also saves Oil, Fuel and Water. The Baker Balanced Valve will increase the power of an engine according to the following:



15 H.P. Engine	3-4 H.P.
20 " "	4-5 " "
25 " "	5-6 " "
30 " "	6-7 " "
35 " "	7-8 " "
40 " "	8-9 " "

"Wilson Lake, Sask. I am very much pleased with your valve, it does all you claim for it."
 Carl G. Rofe.
 Nov. 29th, 1916."

WRITE FOR CATALOG
 AGENTS WANTED IN
 EVERY LOCALITY

THE BAKER VALVE COMPANY
 100 JAMES STREET WINNIPEG, MANITOBA

A Leader for 40 Years

The work of Case steam tractors on Canadian farms is our strongest argument in favor of a Case engine. Day after day, season after season, they are "standing up" under the most trying field conditions. Hundreds of testimonials like that on the next page are annually received from Case users. Could there be any stronger proof of Case superiority?

The Case steam tractor has been a leader in the steam tractor field for 40 years. With the introduction of the gas tractor some makers have neglected the steam tractor. But Case still maintains that for *certain* work and localities steam is and always will be the most reliable power. And so we have improved and refined Case steam tractors. Today they stand *without equal*. Accessibility, low upkeep cost, simplicity, and plenty of reserve power (Case tractors develop 10 per cent. more than their B. H. P. rating) must commend them to every thresherman.

Thousands of Case steam tractors are in successful operation. In every civilized country they are to be found. Your work requires a reliable tractor. If it's steam you want, remember Case has it. Ask any Case user. You'll find them everywhere. Complete details can be secured by sending for our latest catalog on Case Machinery. Write today for all the facts.

Case steam tractors are built in eight sizes: 30, 40, 50, 60, 65, 75, 80 and 110 horsepower.

J. I. CASE THRESHING MACHINE COMPANY, Inc.,

808 Liberty St.

Racine, Wisconsin, U. S. A.

Canadian Branches, Winnipeg, Calgary, Regina and Saskatoon.



CASE

Portage la Prairie, Man.

Dec. 2nd, 1916.

J. I. Case T. M. Co.,
Winnipeg, Man.

Dear Sirs:-

As an owner (in partnership) and operator of one of your machines I am writing you about my experience with the same:

Fourteen years ago my father purchased a Case machine, as follows: forty-five (45) horse power Engine (portable) and a thirty-two (32) fifty-four (54) inch wooden Separator, with all attachments. Nine years ago we traded the engine on a seventy-five (75) H. P. Simple Traction Engine that had run for five years. After slight repairing we commenced plowing and for four years plowed extensively using an eight (8) furrow plow. In that time we have plowed nearly five thousand acres.

Last summer in breaking stiff sod the engine handled the eight (8) plows with ease, plowing a depth of six inches. I was told by owners of other engines that my engine was doing work that no other engine save a Case could do. Such has been my experience with your excellent Case Machinery and may I say that it is the oldest machine in operation in the district and is good for a long time yet.

And now gentlemen I would almost defy any Machine Company to produce a better record. However, I know that your Company have always led while others followed.

Now to prospective purchasers, if you want an engine that will serve you faithfully and never leave you in a tight place take an engineer's word for it and get a Case "so here's to the good old Case".

Hoping that I have not taken up too much of your valuable space, I remain,

Yours truly,

Chas. S. Ashwin
Portage la Prairie



The Sign of Mechanical Excellence the World Over



The Sign of Mechanical Excellence the World Over

Hundreds of testimonials from Case Steam Engine Users are Received Annually.

CASE STEAM ENGINES ARE IN SUCCESSFUL OPERATION IN ALL PARTS OF THE WORLD. WHEREVER THEY ARE TO BE FOUND YOU ARE SURE TO FIND CONTENTED CUSTOMERS. THAT'S WHAT COUNTS.



Best Results from Butchering

By JOHN UNDERWOOD

Business Farmers Describes Methods of Butchering and Curing Meats which have proven satisfactory and insured the best results possible for any one to obtain

IN butchering various farmers have various ways, each man, no doubt, believing his method the best. So it is with myself. Having had many years of experience in the operation I wish to relate briefly some things which may or may not be of interest to others similarly engaged at this season.

For twenty-four hours previous to killing I withhold all feed from the hogs. When this is done the entrails are less likely to be ruptured than when full and the work of removing the fat adhering thereto is more conveniently done. When ready to kill I exercise care to avoid all undue excitement. When the animals are quiet at the time of being killed this aids a freer discharge of the blood, any of which if retained in the flesh prevent successful curing of the meat and causes it to spoil during hot weather. Some men knock their hogs in the head with an axe before sticking, others simply stick them and let them bleed to death, but the method I prefer is to shoot them with a good rifle before sticking them, being sure that the first ball fired enters the brain. I think we should be humane in killing hogs and do it as quickly as possible so as to prevent their suffering. When life is extinct the hog is stuck with a knife of medium length with a keen edge, the knife being inserted just forward of the breast bone and close to it. The blade is then turned and thrust full length toward the tail, being quickly turned from right to left to sever the veins of the neck and avoiding a side or shoulder stick or other defective work.

Of course, before killing, everything has been made ready, water heated, gambrels and spreading sticks at hand, etc. It is very important to get a good scald so that the hair can be easily and quickly removed by the scrapers. The water is first brought to the boiling point, then a small quantity of woodashes is put in which helps to loosen the hair and remove scurf

from the skin. The water is allowed to boil briskly for a few minutes before being used. I am not in favor of guessing at the proper temperature for scalding. I use a thermometer with which the right temperature can be obtained every time. For large hogs weighing around 300 pounds 170 deg. F. is about right; for smaller ones, the water should not be above 150 or 160 degrees, and then the hogs should not be kept in the water long. Anyone who has had experience knows that it is better to have the water too cold than too hot, for in the former case it may be remedied by adding hotter water while in the latter case the hair becomes set and the skin cooked tender so that with ordinary scraping the skin comes off. I have a scalding tank with two trace chains across it on which the hog is laid. One end of each chain is fastened on one side of the tank and when the carcass is on the chains two men each holding the free end of a chain let the hog down into the water, roll the body about three or four times and then pull it out to air. The process is repeated until the hair "pulls easy". When the hair comes off freely from the legs and ears the scald is sufficient. The carcass is then laid on the platform and the scraping process begun, the legs and head being first cleaned.

After the hair is all removed the carcass is hung up by means of a rope and pulley blocks to a firm support previously prepared. The body is washed by drenching it with hot water and all scurf and stray hairs removed by scraping it down with a keen knife. When this is done the carcass is given a dash of cold water and the scraping continued until the hog is thoroughly clean.

To remove the entrails with dispatch and cleanliness requires some skill. With a sharp knife I open up the front of the body taking the greatest care not to cut into the intestines. As the entrails are being removed a large tub is ready to receive them. The

Some Must Fight



and some must produce; but everyone in Western Canada must be doing something for the supreme cause of the Commonwealth in these days. The dairy farmer's place is in the front rank of the great Reserve—that grand Replenishing Force that is to keep the heart, brain and muscle of the brave lads of the front line up to concert pitch. Therefore make the best of your dairy with the

"MAGNET"

Cream Separator

The "MAGNET" is made in Canada by Canadian engineers who have first of all gained their experience on Canadian dairy farms in all essentials to a separating machine that fits in perfectly and economically to every requirement. The result is the "MAGNET"—a separator that more than fulfils the last promise made in its name.

The Clean SKIMMER

We will easily prove what we say by showing you the "MAGNET" in your own dairy. The design and construction of the machine is what has compelled us to double the output of our factory this year.

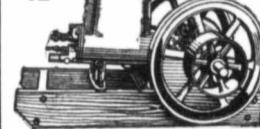
The Petrie Mfg. Co. Ltd.

Head Office and Factory: Hamilton, Ont.

WINNIPEG, CALGARY, REGINA, VANCOUVER, MONTREAL, ST. JOHN, EDMONTON, LETHBRIDGE

1½ h.p. G.G.G. Gas Engine \$42.75

\$42.75 4 h.p. Gasoline Engine \$107



This corrects our advertisement on page 19, December issue, of this magazine. The Gasoline Engine that comes to you under the G.G.G. guarantee gives you a sturdy, dependable power-service that combines low fuel cost and low maintenance cost. Besides the two listed above, we can supply other sizes on skids and with batteries at: 2½ h.p., \$63.50; 6 h.p., \$162.25; 8 h.p. with friction pulley, \$240.00. The 10 and 12 h.p. with friction pulley, on skids, \$358.50 and \$419.50. Magnetos and trucks for smaller sizes at slight additional cost.

Ask us also about our line of KEROSENE engines.

Fill out and mail the Coupon and be prepared for early spring.

The Grain Growers' Grain Co. Ltd.

Branches at REGINA, SASK. CALGARY, ALTA. FORT WILLIAM, ONT. Winnipeg-Manitoba Agency at NEW WESTMINSTER, British Columbia

Please send me full particulars about your gas engines.

Ship us your Grain and Live Stock

I want to use one for

Name

P.O. Prov.

C.T. Jno.

Dr. Thomas' Eclectric Oil
Relieves all Pain in Man or Beast
25 Cent Bottles at all Dealers

fat is removed from the entrails while they are yet warm. The heart, liver, lungs, windpipe and tongue are cut out all together. Having placed a cob or piece of wood in the mouth to keep the jaws apart and the spread stick half way down the belly to open the sides plenty of clean, cold water is dashed in until the interior is perfectly clean.

The carcass is allowed to hang until cold and then taken down and cut into sides and shoulders and hams.

Dry Curing

For dry curing I use the following mixture: For 100 pounds of meat I take 3 pounds of coarse salt, 2 pounds brown sugar, 1 pound allspice, 2 ounces of salt-petre, which is well powdered, and 1 ounce of carbonate of soda. These are all mixed before applied. I rub the meat first with about one pound of molasses for every 100 pounds of meat, then rub with about two-thirds of the preparation until it begins to stick well, which is generally in about eight minutes. The first two days' rubbing is the most important and unless the meat cures then it is not in a suitable condition. After such rubbing the meat is stacked in a large box, first putting in a thin layer of salt at the bottom. A layer of sides is put on this with the rind downward, then another layer is crossed on this and so on until all the bacon has been put in. After twenty-four hours I turn and rub again, adding a little more of the above named mixture, after which turn and rub once in every forty-eight hours, using a little more of the mixture each time. I place the sides which are on top to-day on the bottom to-morrow and so on.

Removing Surplus Salt

In washing I place the meat in water just warm enough to bear my hand in and then brush over with a coarse brush which removes all fat, slime, etc. Then place in a tank with clean cool water for twenty-four hours. This takes out the surplus salt and renders the meat mild cured bacon. Afterwards I hang up in a dry place where there is a good draft. If the days are fine and dry with a little breeze blowing the bacon is generally sufficiently dry in about a week.

In smoking the cuts the smoke is conducted to them as cool as possible. The walls of the smoke house are twelve feet high, the meat being hung up close to the top, the cuts being about six inches apart. From four to five days' smoking is given, care being taken not to smoke too much, which greatly affects the flavor of the meat. I use oak wood for smoking. A small fire is started

beneath the meat on a large piece of sheet iron. The wood is kept dampened which causes it to produce much smoke and little blaze. After being smoked the meat is placed in calico bags, care being exercised to tie them tightly on top and hung from the ceiling until the water gets warm in the spring. It is then packed away in perfectly dry bran.

Some may think I go to unnecessary trouble in the care and handling of the meat, and I will admit that I put a good deal of work on it, but in anything I want the best and I have never eaten bacon that I liked so well, not excepting that put up by packing houses, as the meat made on my own farm. By treating the meat in the way above described I can if I should wish to do so keep it for years in good condition. In the care of meat there is a point that should not be lost sight of and that is maintaining as far as possible an even temperature. Too much heat will cause the fat to melt and turn musty and if too damp it will sweat and decay.

Treating the Lard

In refining the lard we use a large iron kettle set over a slow fire. A small amount of water is poured into the kettle, the vessel then being filled to the brim with fat which has been cut in small pieces and washed to free it from blood and other impurities. A lid is placed over the kettle to prevent the entrance of foreign matter, the fat kept simmering for several hours. The cooking must not be hurriedly done. From time to time the fat is stirred and the cooking continued until the contents cease to bubble and become clear. There is still water in the kettle as long as the contents show a cloudy or milky appearance.

To refine a kettle of lard thoroughly from six to eight hours constant cooking is required. When the liquid becomes clear the kettle is removed from the fire for the contents to cool. The cracknels are dipped from the kettle, the liquid then being pressed out of them with a lard press. The lard is strained through small wire sieves which prevent any of the fine particles from getting into it. The lard is preserved in lard cans which are purchased at the stores for about twenty cents each. These cans are those used by packing houses and have, of course, previously held lard. The trimmings of the meat, together with the head, feet, liver and kidneys, are used in making sausage, sour souse and head cheese, all of which is sold to people in town at a good price, except that which is preserved for future use in our home.

Manitoba Agricultural College

Short Courses In DAIRYING

**Home Dairy Course
Factory Cheese Makers' Course
Creamery Butter Makers' Course**

Commencing on February 5th, 1917, and extending over a period of three weeks, the following short courses in Dairying will be held at Manitoba Agricultural College:

For farmers' sons and daughters a course in **Home Dairy** work will be given. Home Dairy butter-making, care and ripening of cream, running of hand separators, and the making of soft cheese are among the subjects to be taken up.

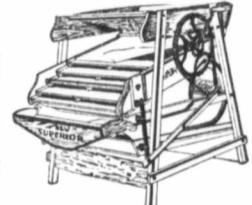
A course for **Factory Cheese-Makers** and another course for **Creamery Butter-makers**. Included in these courses will be lectures and practical work on Creamery butter-making. Cheddar cheese-making, milk and cream testing, and milk, cream, cheese and butter grading. Sufficient time will be spent in **Engineering** to qualify those in attendance to write on third class engineering papers at the close of the session. Write for folder giving full particulars.

J. B. REYNOLDS, M.A., Pres., Manitoba Agricultural College, Winnipeg

KING OF WILD OAT SEPARATORS

Save dockage, clean your grain before marketing with The Lincoln "New Superior" Wild Oat Separator. With our patented open and blank space sieves it positively separates every wild oat seed, causing them to lie flat, and not up on end. It is strong, well-built and bolted—not nailed. Our machine is built to clean any kind of grain and do perfect work. What the "New Superior" cannot do no other can do.

Made in sizes 24, 32 and 42 inches wide, with or without bagger, and with power attachment for gasoline engine if desired.



The Lincoln Smut Cleaner and Pickling Machine

No machine can equal them for treating Seed Grain. Made in two sizes. Sold on a positive guarantee to prevent smut.

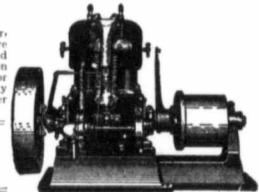
With high prices assured for grain next year, every farmer will realize the necessity of treating his seed grain so that he may have an increased yield of perfect quality grain. Lincoln Smut Cleaners separate smut balls, wild oats, king heads and all light seeds from wheat, also wild oats and all light seeds from barley. By them the farmer can get perfect results. The grain is thoroughly pickled and elevated into the wagon box, being dried by the draining through elevator sieve. An automatic skimmer removes all impurities over a drainer-sieve at tail of machine, ejecting same, while wasting none of the pickling solution. Capacity 30 to 75 bushels per hour. No. 3 machine handles 30 to 50 bushels per hour; No. 4, 50 to 75 bushels, accommodating either the small farmer or the large grain raiser. Strong construction, heavy timber; rustless solution tanks

of 30 to 50 gallons capacity. Write to-day for particulars and prices.

8 H.P. Weighs 320-lbs.

Double cylinders mean not only double power, but steadier power. Each cylinder is same bore and stroke as in 4 H.P. Throttle governed and equipped with Schebler Carburetor and Friction Clutch Pulley. A splendid powerful engine for heavier work than 4 H.P. can handle, such as heavy grinding, small threshers, etc., or for any power from 3 to 9 H.P.

Talk with your dealer about the CUSHMAN LINE or write for FREE CATALOG

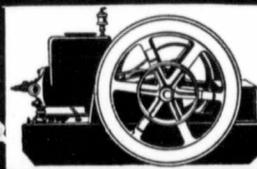


Cushman Motor Works of Canada

(DEPT.) Whyte Ave. and Vine St.

WINNIPEG, Man.

DREADNAUGHT



ENGINES

To The Western Steel & Iron Co., Ltd. Winnipeg, Canada

Sirs— Send me your catalogue of Dreadnaught Engines and your Best-in-the-West Engine Proposition.

Name _____

Address _____

A 3-HOUR DAY FOR THE HORSE

The horse has a three-hour day according to a Minnesota investigation carried on under the direction of Thomas Cooper, now the director of the North Dakota Experiment Station. It was found that a farm horse averaged about 100 hours labor per year or about three hours per day. It was also found that the cost of maintenance for the horse was \$85 per year. This emphasizes the need of watching closely to see that too many horses are not kept. It also emphasizes the need of keeping brood mares and raising colts, so as to get more returns from the work horses than the three hours of labor per day.

Corn Smut

Corn smut is usually found on the tassel, ears or at the joints. It is not transmitted on the seed as is the case with wheat and oat smut. So treating the seed does no good. The black mass into which the smut transforms the part of the plant attacked is composed of millions of spores, each of which can grow. These spores are hardy, they can withstand extremes of weather conditions and may even pass through animals without losing their vitality. In the spring spores grow and send up a little stalk that produces several spores. When these blow onto the corn plant they take root and start producing smut masses. A field that has been in corn or one on which manure containing corn-stalks has been applied will be infected. If corn is not grown for three years the smut infection will be pretty near gone on that field.

Winter Dairying

Winter dairying has been found to be the most profitable dairying. When the cows freshen in the fall they will give a good milk flow during the winter, and when turned on the summer pastures the milk production will be given a new impetus. The drying up period will come at the time when work is the most pushing, when flies are the worst and when pastures are short.

Another advantage of winter dairying is that milk and butter fat bring the highest price in the winter and labor is the cheapest. On many farms a number of cows could be cared for without any extra labor during the winter.

The silo is a great aid in any kind of dairying, but especially so in winter dairying. Silage is a good deal like pasture, and when supplemented with alfalfa hay and some grain feed a maximum milk flow can be expected.

The cows that freshen in the fall will produce more milk dur-

ing the year than those that freshen in the spring and the largest milk production will come when the prices for milk and butter fat are the highest and labor the cheapest.

Heat and Cold and Germs

Germs cause many diseases, cause decay, cause souring of milk and a great many other changes. The bacteria become inactive when cold, but are not killed. When they warm up again they become active.



CANADA
NATIONAL SERVICE

PUBLIC NOTICE is hereby given under the authority of the "War Measures Act, 1914," that during the first week in January, 1917, an inventory will be made by the Post Office Authorities, of every male between the ages of sixteen and sixty-five, residing in Canada.

National Service Cards and addressed envelopes for their return to Ottawa have been placed in the hands of all Postmasters for distribution amongst the persons required to fill in such cards. Every male person of the prescribed ages is required to fill in and return a card enclosed in an envelope within ten days of its receipt.

Any person who fails to receive a card and envelope may obtain the same upon application to the nearest Postmaster.

R. B. BENNETT,
Director General.

Ottawa, 15th December, 1916.

THE NATIONAL SERVICE CARD

1. What is your full name?		2. How old are you? years.	
3. Where do you live? Province.....		5. In what country were you born? - - -	
4. Name of city, town, village or Post Office } Street..... Number.....		6. In what country was your father born? }	
10. How much time have you lost in last 12 months from sickness? }		7. In what country was your mother born? }	
11. Have you full use of your arms?		8. Were you born a British subject?	
12. Of your legs?		9. If not, are you naturalized?	
13. Of your sight?		15. Which are you—married, single or a widower? - - -	
14. Of your hearing?		16. How many persons besides yourself do you support? }	
17. What are you working at for a living?			
18. Whom do you work for?			
19. Have you a trade or profession?		20. If so, what?	
21. Are you working now?		22. If not, why?	
23. Would you be willing to change your present work for other necessary work at the same pay during the war?			
24. Are you willing, if your railway fare is paid, to leave where you now live, and go to some other place in Canada to do such work?			

GOD SAVE THE KING

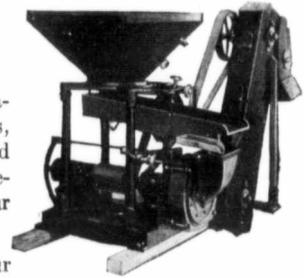
For instance, when milk is warm it sours quickly. When it is cold the souring is retarded, and if cooled enough the souring is stopped altogether. Hog cholera germs may be frozen in straw soil or manure and when they thaw out in the spring if taken into a hog give it hog cholera. Heat kills germs. Many bacteria are killed at a temperature of 140 degrees F. when kept at that temperature for 10 minutes, while other bacteria have to be kept at the boiling point two or three

hours to kill them. Disease germs in milk are killed by the so-called pasteurization which consists in heating the milk to 140 degrees for 10 minutes. In canning vegetables it has been found that some must be boiled two to three hours to make them keep.

The keeping of many farm products in condition for market or for use on the farm depends on keeping the bacteria from multiplying and this can be done by either keeping the product cool or heating it to kill the bacteria.

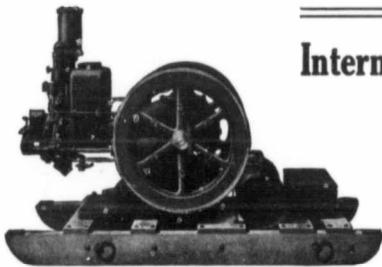
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EAST—Hamilton, Ont., London, Ont., Montreal, Que., Ottawa, Ont.
Quebec, Que., St. John, N. B.

Wintering Horses in the Open on the Prairies

For many years the idle work horses at the Lacombe Station have wintered in the open. When oat straw has been available in liberal quantities no other feed has been provided and under such conditions the horses have wintered satisfactorily. In the winter of 1911-12 all the horses in the open made a gain in flesh wintered in this way, certain horses gaining as much as 70 pounds each. In the winter of 1913-14 horses were wintered under these same conditions, and without exception increased in weight at a cost not exceeding \$1.00 per month per head. This method of wintering is productive of particularly good results when the straw stack is located in a bluff in a pasture field where the horses can obtain even a small amount of grass supplement. Water should be accessible at least daily and better if available at all times. Under such conditions, where straw is available in such quantities as to make it necessary to dispose of it by burning, the cost of wintering horses on straw is practically negligible.

When straw roughage is not available it is necessary to feed either hay alone or hay with some

grain, but even when this is necessary owing to the shortage of straw, it has been found more economical, particularly in the health and condition of the horses in spring to winter in the open rather than in stables. During the past season horses were wintered in the open, being fed hay and grain. The winter was unusually severe and the consumption of hay per horse ran high, amounting to 28.3 pounds per day. The average daily consumption of grain during the past winter was practically 4½ pounds. With prairie hay valued at \$5.00 per ton and grain at one cent per pound, the cost per horse per day was 11.47 cents. Even when the thermometer registered as low as 52 degrees below zero, the above proved to be more than a maintenance ration, and all horses gained in weight and were in excellent health in the spring. From the above experience it would appear advisable to recommend the wintering of horses in the open.

Cheap Shelter For Feeding Cattle on the Prairie

The usual apology for so few live stock seen on the average prairie farm is the lack of capital, suitable buildings or shelters, fences, market facilities and water supply. Of these, perhaps, the greatest barriers to contend with

are the lack of suitable buildings and abundant water supply.

For the past few years the Indian Head Experimental Farm has conducted experiments in feeding with the object of comparing various shelters, such as the stable, the open corral with a high board fence, the straw-covered shed and the bush or straw stock shelter.

During the winters of 1913-14 and 1914-15, which were rather mild, the average daily gain per steer wintered outside was 1.95 and 1.75 pounds respectively. However, the winter of 1915-16 was unusually severe and the average mean temperature for December, January and February was 5.40 degrees. Nevertheless, the average daily gain per steer under the various outside shelters was 1.65 pounds. It is obvious from the above results that the question of buildings need not deter a man from entering the live stock business. Feeders do relatively better outside than when housed in expensive barns. With prairie hay at \$10.00 per ton and feed grain at 1¼ cents per pound, or \$25 per ton, a fair average profit may be realized each year, with manure as a by-product. A market is thus provided for the rough feeds and low-grade grain grown on the farm.

Where natural shelters, such as

scrub and brush are not available, a corral with a board fence about seven feet high and a rough straw-covered shed, open to the south, will provide sufficient shelter from the stormy weather. These shelters are easily and cheaply constructed on the average farm and will be found satisfactory for all classes of live stock. Well-fed cattle are not averse to cold weather, providing they can get out of the wind. The shed and also a space in front should be kept well bedded with straw, and almost invariably the cattle will choose to lie in front except on very cold days.

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The Cow at Calving Time

There is no time in the whole milking period that has such an important bearing on the establishment of a standard of production for the year, as the periods previous to and following calving time. It is understood by many, but not by all, that if a sow is allowed from six weeks to two months in which to rest from one lactation period to the next, she will yield more than when milked continuously up to the time of parturition. We know the effect upon ourselves when our faculties are continuously at work, especially when the nerves are brought into play. And it is a fact that parturition vitally disturbs the nervous and physical activities, especially the forces of digestion. The act of calving brings stimulation to the milk-producing organs, which is the only natural and effective means of stimulating milk secretion, and it is a serious mistake not to make the most of it. It is necessary to handle the cow in such a manner as to derive full benefit from this stimulation, while it is yet present, since with most cows it rapidly wears off if not utilized.

With many cows freshening in the fall, this question concerns many. Rather liberal feeding, which actually builds mild nutrients on the body, during the last few weeks of the lactation period and while the cow is dry, is the secret of preparing the cow for the succeeding lactation period. This may appear to be wasting feed, but this is the important period when it is most valuable. During the last few weeks of the milking period, grain may be fed at the rate of one pound to each two pounds of milk produced, reducing at the period when the cow is to be dried. A good many have trouble in drying off persistent milkers by the plan of skipping milkings, but when less than fourteen pounds of milk is yielded, daily milking can be discontinued at any time without serious difficulty if accompanied by a reduction in the feed. The udder will become filled but

the fluid contents will soon be absorbed. When dry, about eight pounds of grain should be fed daily, more if the cow is in poor condition. It would not be profitable to feed inferior cows in this way. These, however, cannot always be detected from the others unless all have an equal chance, and weeding is practised, based upon the records of production. The grain ration should be bulky, laxative and nutritious, having slightly more carbohydrates than a milk ration, with a nutritive ratio of about one of protein to seven of carbohydrates and fat equivalent. If a high percentage of fat is sought, even more liberal feeding of grain will be useful.

During this period, protein and fatty tissues are actually being stored upon the body, to be used in the production of milk before the cow is in shape to digest and assimilate a full ration. A cow is like a toboggan, in that the higher she starts at the beginning of her slide, the faster and longer will she keep running. It is just as serious to crowd the appetite during the first month after calving, as to neglect to lay on this supply of nutrients. The cow should be kept hungry. If fed all she will eat, harm will be done, and a check to her flow is the natural result of going "off feed," as most cows reach their limit early by this sort of handling.

A week before calving, reduce the grain ration to four or five pounds, feeding mostly bran and oats. On the day of calving, a pound and a half of epsom salts, lukewarm water and good hay are enough for a well-conditioned cow, although two quarts of bran mash may be useful. Begin the next day to feed lightly, and after four or five days introduce a grain mixture gradually. Increase this gradually about a fourth of a pound per day. Do not expect a cow to handle all the feed called for by her yield of milk. If she has been properly conditioned, and is coming to a good flow from one month to six weeks is early enough to get her on full feed.



Something worth "Snapping" (Courtesy Can. Kodak Co.)

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Some fine "Faying Guests" (Courtesy Man. Dept. of Agriculture)

The Wholesale Depletion of Poultry Laying and Breeding Stock Not Warranted Under Present Conditions.

Judging from the unprecedented heavy deliveries of poultry on the central eastern markets so early in the season, it would appear that farmers and producers generally are not only depleting their flocks unwarrantably but also rushing them to the market in an unfinished condition. As a result, the current price of chickens is much below normal value at the present time, in comparison with the prices of other meats. This is directly due to the overloading of the market.

With the brisk inquiry for Canadian poultry from Great Britain, it is expected by exporters that the demand for well finished, good quality stock will be very keen during the coming winter. Besides, there will be a good demand for home consumption. The price for well-finished birds continues firm, but with so much poor stock arriving wholly unsuited for either storage or export, many buyers have recently reduced their quotations for all low grades.

The presence of pullets and young fowl has also been noted in many shipments. This is most unfortunate considering the price of eggs. The very firm prospect for the profitable marketing of all poultry products points to the necessity of conserving in every possible way all suitable laying and breeding stock. Unless this is done, there will be but little poultry left in a short time on the farms in the central eastern portion of the country. Even though feed is scarce and high, it would pay farmers well to finish the birds before offering them for sale and spread their deliveries over a longer period.

Current receipts to date have consisted mainly of live poultry. The season is now sufficiently advanced, however, to warrant more liberal shipments of dressed poultry. In light of the fact that there will be a considerable movement of Canadian poultry to

Great Britain, it is of the utmost importance that all poultry killed on the farms, in addition to being well-finished, be properly killed and dressed. The British market, in fact all large markets prefer poultry bled in the mouth and dry picked. While killing by dislocation may be preferred by some, the presence of blood in the neck and the resultant discoloration make it unsuitable for storage or export purposes.

Proper and complete bleeding is most essential. Sometimes the arteries of the neck are not completely severed, the bird fails to bleed properly, with the result that the carcass takes on a reddish appearance. With proper attention to details, a useful reputation for Canadian poultry can be established on the British market this year. It is of the greatest importance, therefore, that all poultry marketed be well-finished, well bled and dressed and packed in the most attractive manner possible.

PRODUCE MORE EGGS

Continued from page 48 Dec. issue

If the grain feed, etc., mentioned can be fed, animal foods, such as beef scrap, may be curtailed or dispensed with. High-priced mashers may be eliminated and cheaper ground feeds such as bran substituted. Two or more of the grains may be mixed in equal proportions for the grain rations. The mash may consist of ground barley and oats, or bran may be added. If grain has to be purchased cracked corn is as cheap as anything and makes a suitable addition to any grain ration. Bran is as cheap a food as one can buy for the mash.

The mash can be fed dry in a hopper or mixed with milk and fed moist once a day. Any table scrape should be used in the mash. If milk is not available, beef scrap or other animal food should be fed in the mash. In a good heavy litter, feed a mixture of the grain ration morning and night, allowing the hens sufficient grain so that they will always

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have some in the litter, but not so much that they can get a crop full without scratching for it. In the prairie provinces there is considerable shrunken wheat available. Shrunken wheat if it is dry is as good a poultry food as wheat fit for milling purposes. Care must be taken that it is not damp or otherwise spoiled. Shrunken wheat alone, if there is no other grain, will answer for the grain feed. For the mash, use bran, middlings or chopped oats. Elevator screenings, free from black seeds, make a good feed for either grain mash. If alfalfa or clover can be had, by all means give the leaves to the hens.

In central Canada, Ontario and Quebec grain is scarce and it is likely some will have to be purchased. If there is feed wheat from the West available, it should be used. Cracked corn may be purchased and other farm grains which may be on hand or purchased locally, such as barley and buckwheat, might be used. Bran can be used in mash feed and the good crop of clover in Ontario and Quebec will do much to cut down the cost of the ration. The clover may be fed dry or steamed and used in a mash.

In the maritime provinces where grain is usually purchased for the poultry the same advice may be given as that for central Canada, not forgetting the clover

and milk. If small potatoes can be had for poultry feed they may be boiled and fed in the mash.

In every case, grit and shell should be before the layers at all times. In some localities the grit can be secured from the local gravel pit and in other cases sufficient lime can be secured to do without the commercial shell. If neither of these is available they should be procured and as much given to the birds as they will eat.

It does not pay to stint the layers. If they do not get the feed they will not lay the eggs.

MAKE HEN EXERCISE IF YOU'D HAVE EGGS

Activity is the life of the laying hen. As her activity decreases, so does her egg production. The hen that stands around all day, and scarcely has enough energy to eat food placed before her, is never a laying hen.

The amount of forced exercise necessary will vary with the breed. The Leghorn, conceded to be the highest egg producer, and most active bird, will take a great deal of exercise. The Brahma is an example of the other extreme, and must always have a strong incentive to exercise. The vigor and productivity of the free-range hen as compared to one yard-confined is largely accounted for by her active life.

During the winter months exercise can best be managed by feeding all the whole grain in a litter ten to twelve inches deep. This will not involve a waste, for if hens are left a little hungry they will scratch long after the last kernel has been found.

Laying hens should never be fed in such quantities as to satisfy their appetite. Whole grain should be fed very sparingly in the morning, and heavily at night. This not only keeps the birds more active, through the day, but a heavy feed of grain at night keeps their bodies warmer.

Straw, hay, alfalfa chaff, leaves and cut corn stover, all make good litters. Shavings and sawdust are not best because they tend to pack, and also hold dampness. Regardless of the kind of litter used, it should be renewed frequently and never allowed to become badly contaminated with droppings.

Exercise can be further encouraged by suspending a head of cabbage, or a few roots, above the reach of the hens. At butchering time a part of the offal, or a raw bone hung in a similar way, will keep hungry hens on the jump most of the time.—C. S. Anderson, Colorado Agricultural College.

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Handling Young Chicks

Chicks need no food from two to three days after hatching. They should be kept warm. During the first week the temperature should not fall below 95 degrees Fahr. and during the second week it should be held up to 90 degrees Fahr. When they crowd under the hover of the brooder it is a sign that they are cold. Fifty chicks is enough for one brooder. When too many are put together they sometimes pile on top of each other and some smother. When the chicks are 48 to 60 hours old feed them equal parts of bread crumbs and oat meal to which add a little chick grit. Feed 4 or 5 times a day and only what they will eat up in a few minutes. After the third day feed a good quality of chick feed. Sprinkle it in the litter which should be made up of a thin layer of short cut alfalfa or

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fine cut straw. A home made chick feed can be made as follows: Cracked wheat, 35 pounds, fine screened cracked corn 30 pounds, pinhead oat meal 10 pounds, crushed peas 3 pounds, millet seed 3 pounds and fine charcoal 3 pounds. Keep grit charcoal and water before them all the time. After the first week begin giving beef scraps in small quantity. Feed sparingly at first, one ounce for 40 or 50 a day. Provide green food, sprouted oats are best. Mangels, green clover and lettuce are also good. When an open range the grass will answer. After the chicks are two weeks old a mixture of equal parts of wheat bran and beef scraps may be kept before them all the time. When 4 weeks old the following mash mixture can be fed in hopper: equal parts of bran, corn meal, wheat middlings and rolled oats to which add 10 per cent of meat scraps. When the chicks are 5 weeks old ground oats may be used in place of the rolled oats. And when 6 weeks old the chicks feed can be discontinued and equal parts of wheat and cracked corn fed in its place. Keep the mash before them in hopper.

Blacksmithing

Continued from page 16

red heat and twisted. To do this, the piece is clamped vertically in the vice by the hook, and as shown in Cut (F), with the point (k) at the top edge of the vise jaw, and a monkey-wrench is fitted to the ring end, immediately

Upsetting—Ramming
When it is desired to upset, or thicken a portion of a piece of

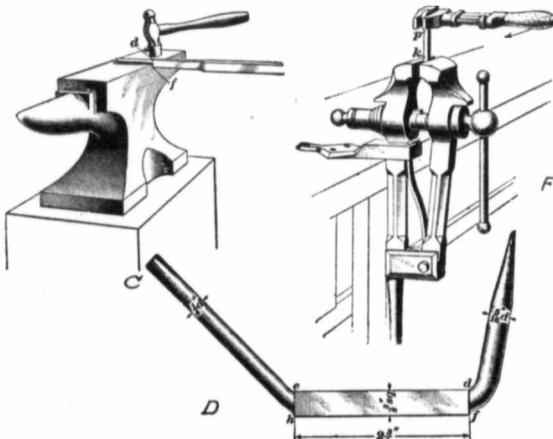


G

iron, this part is heated to a bright red, the rest of the bar being kept cool by pouring water over it with the sprinkler. When sufficiently heated, the piece is brought to the anvil and upset, either by ramming or with the hammer. If the bar is from 2 to 3 feet long and is to be upset at the end, the heated end of the bar is rammed against the face of the anvil, as shown in Cut (G) or on a block of iron bedded in the ground, called a bumping block. The entire energy of the blow is concentrated at the hot end of the rod and drives the particles of the iron near the end together in the direction of the blow, this



B.



above the point (p). The wrench is then given one complete turn, twisting the square part as shown in Cut A. If it has become bent, it may be straightened by hammering it between two blocks of wood on the anvil so as to avoid battering the sharp edges.

bulges out the iron where it is hot.

To be continued next month

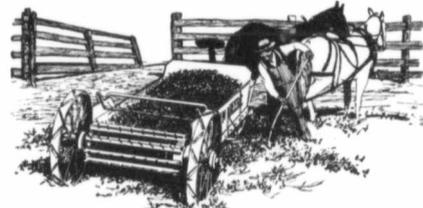
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We found that our package sizes should be changed. Farmers wanted a \$1.00 package. Here it is: enough for 100 acres. We have changed the label and sizes, that's all.

Same Old Name Same Fluffy White Powder Same Sudden, Certain Death Same Money-Back Guarantee



Let Kill-Em-Quick clear your land of gophers—protect your crop. Gophers follow its odor until they find it. They always eat it. It always kills—Money Back, if it fails. Save the price of your seed grain—that's what Professor V. W. Jackson of the Manitoba Agricultural College says gopher losses equal. That college recommends Kill-Em-Quick as "the most efficient and entirely satisfactory." They've tested it. They know. **Get Kill-Em-Quick Early—Be Ready—Kill the gophers early in spring. They do their greatest damage when crops first come up. Get it from your druggist. If he can't supply you, we ship direct upon receipt of price. 40-acre size, 50¢; 100-acre size, \$1.00. Send for Free Gopher Book.**



An Old Friend In a New Dress

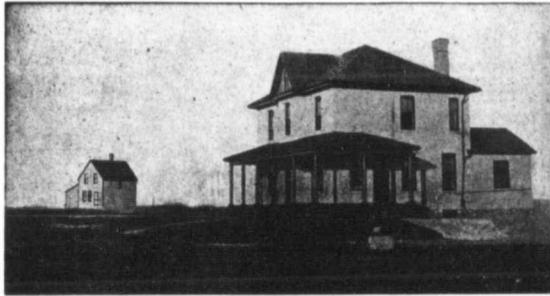
Kill-Em-Quick Co., Ltd., Dept. C Winnipeg, Can.

FREE DISTRIBUTION of TREES

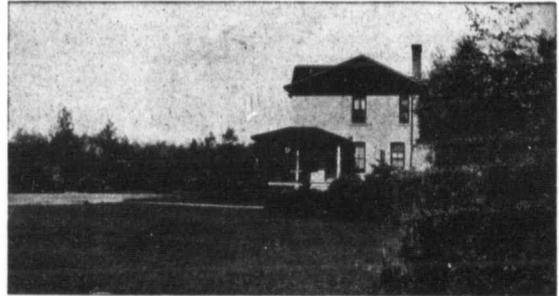
BY THE
GOVERNMENT OF CANADA

Any Farmer living in Manitoba, Saskatchewan or Alberta can procure, **Free of Charge**, enough seedlings and cuttings of hardy forest trees to establish a good shelter-belt around his farm buildings and garden.

Over thirty thousand successful plantations have been established as a result of this distribution. Already over 31,000,000 trees have been given away free. About 5,000,000 will go out this spring. Increase the value of your farm and make it more homelike by planting trees.



Superintendent's Residence on Nursery Station at Indian Head, 1905



Same place in 1914

All Applications for trees to plant in 1918 must be received **before** March 1st, 1917.

A limited number of **Evergreens** is available for delivery this spring under special conditions. Evergreens grown in the Nursery have thriven well in all parts of the Canadian West in the past ten years, proving their suitability for prairie planting.

All applications and enquiries should be addressed to

NORMAN M. ROSS, Nursery Station

INDIAN HEAD, SASKATCHEWAN

Write for Bulletins on Tree Planting

A New and Dependable Kerosene Tractor

Common sense is the royal road to the solution of every difficulty on earth—particularly the problem of the farm tractor. The overwhelming advantages of the tractor to any farmer who is entitled to have one, are self-evident and need no longer be advertised. The man who is entitled to have a tractor is the farmer who is in a position to pay for it; who is farming sufficient land to make it a paying investment; and, of course, before buying it, either he or someone employed by him has sufficient gumption and experience to use it as it ought to be used.

There are several drawbacks which so far have influenced quite a large number of capable farmers in deciding against the tractor, not the least of these being the fuel cost where the use of gasoline is necessary to successful operation. Another and possibly more serious one being the fact that in building a tractor of minimum weight, this has generally been followed by a corresponding weakness in those parts which are subjected to unusual strain on heavy or uneven land.

New developments are cropping up every day, but perhaps one of the most important of these is the "Townsend" twin cylinder kerosene tractor, which is being handled by The Canadian Fairbanks-Morse Company, Limited. Mr. R. C. Townsend, the designer of this tractor, was associated with the Fairbanks-Morse Company for many years, and the idea which is now materialized is not a child of recent birth, but was conceived many years ago while Mr. Townsend was engaged in the company's engineering service.

His experience in the development of kerosene burning tractors has won him a recognition that could not possibly be withheld or belittled, and the introduction of the "boiler frame" tractor will probably mark a red-letter day in the progress of gas engineering.

This particular feature—the "boiler frame"—is a departure which speaks for strength and dependability in the field in a way that needs no explaining to the tiller of our Western soil. In order to test this "backbone" of his machine, Mr. Townsend, in the course of his experiments and before offering anything for sale, placed a number of the engines with different men (unskilled operators for the greater part) with instructions to subject the machinery to the most severe treatment—abuse, in fact, and if they could, wreck the outfit in their endeavor to discover a weakness in it.

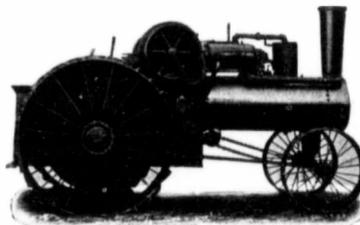
In the immediate neighborhood of these trials, little short of a sensation was the result, and since then, the details of those experiments have travelled far afield. There are now many in-

terested men eagerly awaiting the opening of the season to start their 1917 prospects with a "Townsend," and their confidence in the result is backed beyond a peradventure by the fact that it is being sponsored and marketed by the Fairbanks-Morse Company.

As is well known, the Fairbanks-Morse plant at Toronto is exclusively engaged in national service, and notwithstanding the extensive increase of facilities at the company's Beloit plant, they have found it extremely difficult to keep pace with the demand for their famous "Z" and "Y" stationary engines which are now a household word all over Canada. This necessitated the establishing of an entirely new plant by Mr. Townsend, but his success in this respect has been of such a nature as to guarantee the most complete satisfaction alike in quality and quantity of output, unless the latter should extort altogether unreasonable demands in delivery dates.

Some details of this new engine will be found on page 13 of this issue. The steam boiler frame is an absolute guarantee of strength, rigidity, and therefore perfect alignment under the worst conditions. It would seem that this cylindrical shell of thick boiler

THIS IS
NOT
A
STEAM
ENGINE



Patmore's Reliable Seeds, Trees, Shrubs and Plants

COLLECTION No. 1

Contains 22 varieties of our Reliable Vegetable Seeds in packets and ozs. 2½ lbs. of seed for \$1.25 prepaid.

COLLECTION No. 2

15 packets of Reliable Flower Seeds for 25c. prepaid.

FARMERS' COLLECTION No. 3

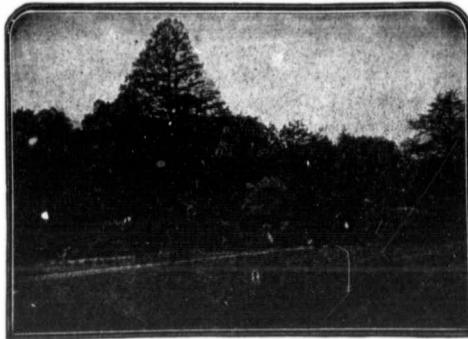
Contains 1 lb. Mangel, 1 lb. Sugar Beet, 1 lb. Swede, ½ lb. Carrot, ½ lb. Kale and 4 lbs. Rape—8 lbs. seed for \$3.00 prepaid.

Write To-Day for

Our 1917 Catalogue

in which we list all the hardiest and best varieties of Vegetables and Flower Seeds, Fruits, Trees and Shrubs, Grasses, Fodders and Seed Potatoes.

Profusely Illustrated and Cultural Directions



We are special agents for Messrs. Sutton & Sons, of Reading, England. We list in our Catalogue the hardiest varieties of their World-Famed Seeds in sealed packets at 10c. per packet.

For \$10 Cash with Order we will send prepaid to any address—

- 50 Currant and Gooseberry Bushes of best varieties.
- 100 Raspberry Plants, best varieties.
- 12 Plum and Fruit Trees, young and thrifty, 2 to 3 ft. high, and 12 Rhubarb Roots.

All of above for..... \$10.00

We have growing in our Nursery and offer for sale:

- 500,000 Caragana, 1 to 3 ft. high.
- 253,000 Native Maple, 1 to 3 ft. high.
- 6,000 Ontario Maple, 2 to 6 ft. high.
- 12,000 Native Ash, 1 to 8 ft. high.
- 150,000 Russian and other Poplar in all sizes.
- 50,000 Lilia, 1 to 3 ft. high.
- 115,000 Russian Golden Willow in all sizes.
- 70,000 Russian Laurel in all sizes.
- 5,000 Crab Apple and Plum Trees, and a large stock of all hardy fruits, ornamental shrubs, plants, etc.

Patmore Nursery Co. Ltd., Brandon

Please send me Collection No.....
 as advertised in Canadian Thresherman and
 Farmer, for which I enclose \$.....
 NAME.....
 ADDRESS.....

THE PATMORE NURSERY CO. LTD. BRANDON, MAN. SASKATOON, SASK.

plate, strongly rivetted and reinforced with heavy heads and a sufficient number of boiler tubes, is the logical solution to the problem of vibration which has baffled designers of gas tractors, while it was naturally solved for builders of steam engines.

In a brief notice, it is not possible to do justice to many other points which are scarcely less important than the one touched upon. We feel sure that the "Townsend" has more in it than meets the eye at first sight, and that it will pay any farmer who is contemplating a purchase to get familiar with it through our friends, the Canadian Fairbanks-Morse Company, Limited.

The Forest Dollar

Although the interests of the farm and the forest have been regarded in the past as more or less distinct and hostile, the broader outlook stimulated by the war has brought intelligent Canadians to understand the woodsman and the agriculturist as close partners in the great Canadian estate.

More than sixty per cent of the whole area of Canada is adapted by Nature for growing timber or held as permanent barrens and will not produce field crops profitably. On this sixty per cent no farmer desires an acre. At the same time it ought to be producing revenues for the nation. As much of it as possible should be kept under forest growth, producing wood crops regularly. This is the argument for "forest conservation" in a nutshell. No one asks to be allowed to use agricultural lands for tree growing. And no farmer will object if the country maintains non-agricultural lands in their natural money



ANTON MICKELSON

MY OWN GOPHER POISON

is an improvement on all other gopher poisons. "MY OWN GOPHER POISON" is so pleasing in appearance and smell that gophers will search for it and eat it ravenously. The very smallest amount will kill a gopher instantly.

This is Anton Mickelson

Inventor of the first real Gopher Poison. There are several imitations on the market to-day all claiming to be just as good.

Don't Let Them Fool You

The original is put out under the name "MY OWN GOPHER POISON," and every package has the above photograph on it. Don't buy a package without the photograph—even if it has his signature on it. Imitators have gone so far as to use it too.

Buy it at your dealer's. If he can't supply you, sent postpaid on receipt of price—50c, 75c and \$1.25 sizes.

PRAIRIE CHEMICAL COMPANY

MANUFACTURERS

302 Keewayden Bldg. Winnipeg, Man.

making conditions, giving timber harvests year by year.

The Forest Dollar, therefore, is not earned at the expense of agri-

culture, but is the ally and supporter of agriculture. Canada takes \$200,000,000 a year from the forests, and a very great part of this amount goes to purchase farm products. Until every destructive forest fire is stopped and every timber-growing area restored to its productive condition, Canada's agricultural interests must suffer the chief loss. Of every hundred dollars that come out of the forest, seventy-five dollars go for wages and supplies. The remaining twenty-five dollars pay interest on the lumbermen's investment and help make up the \$7,500,000 taken by the governments each year in taxes.



TWO of the big companies organized by farmers of the Canadian West have decided to join in order that they may be in still better position to conduct the business of the farmers. This union of forces means closer co-operation between the 18,000 shareholders of the Grain Growers' Grain Company and the 12,000 shareholders of the Alberta Farmers' Co-operative Elevator Company. It also means that the new company, which is to be known as The United Grain Growers', Ltd., will be bigger and stronger and better able to look after the interests, not only of shareholders, but of other farmers throughout the West, in connection with the disposal of grains and live stock and the purchase of implements and general supplies needed on their farms.

The union had been given careful consideration by the directors of the Grain Growers' Grain Company, in consultation with directors of other companies and organizations during the past 12 months. The proposal to amalgamate was accepted as being the most satisfactory from the standpoint of service to the farmer. Details will be worked out so that the United Grain Growers, Ltd., will be a reality before the crop of 1917 is ready for market.

Grain Growers' Annual Meeting

At the meeting of the Grain Growers' Grain Co., Ltd., which was held in their new warehouse, 145 Market Street, Winnipeg, President Crerar, in his address to shareholders, covered in detail the activities not only of the company and its various departments, but also with the various subsidiary companies. In connection with the Country Elevator Department, it was pointed out that the revenue for the year ending August 31, 1916, was \$597,303.23, against \$292,288.20 for the previous year. The profit for the past year is \$161,607.94, due chief-

Union of Two Great Farmer Companies

ly to the large volume of business handled, 14,737,687 bushels. Owing to short crop he expressed a doubt as to whether the department would prove profitable this year.

The terminal elevator at Fort William, leased by the company, handled 28,463,438 bushels against 11,152,835 for the previous year.

Machinery

The president pointed out that the total sales made by the Co-operative Supply and Machinery Department, amounted to \$1,363,951.63, and that only a small profit resulted. Difficulties met in operating this department were related, and it was pointed out that since the outbreak of war in Europe the increased demand for practically all commodities handled has been great enough to create continual increases in the price of raw material. It was noted that with the new warehouse in Winnipeg and warehouses in Calgary and Regina purchases of large quantities could be made and implements and supplies held in stock ready for immediate shipment.

Last Year's Business

Dealing with the finances of the company it was pointed out that the profits on the year's business amounted to \$572,804.33. The usual dividend of 10 per cent on the par value of paid-up stock had been sent to shareholders, and funds in bank and on hand were \$565,542.10. Shareholders of the company now total 18,163, with paid-up capital of \$1,073,179.95. The total volume of grain handled in the twelve months ending August 31, 1916, was 48,375,420 bushels. The reserve fund now stands at \$600,000.

"It is quite within the mark," said the president, "to state that

the financial position of the company has never been sounder than it is to-day. During the ten years covered since the company began business the shareholders always have received a 10 per cent dividend, on their money, with the exception of the first year, when the dividend was 7 per cent. On the present value of the company's assets, their shares are worth 50 per cent more than the par value, and this, looking at it alone from the point of view of the actual return in dollars and cents. If we view the results of the company's existence from the indirect benefits they have brought, they are very much greater and cannot be adequately estimated. Taking it all in all, the shareholders have some reason to feel proud of the progress their company has made in the first ten years of its history."

"From the 1st of September, 1906, to the 31st of August, 1916, the number of shareholders in the company has increased from a few hundred to 18,163, the paid-up capital from \$5,000 to over \$1,073,000, the profits earned from \$790 in the first year of the company's history to over \$575,000 in the present year. The total grain handled during this period is over 205 million bushels. The total profits earned amount to \$1,488,740.97, and the total dividends paid to shareholders to \$550,000. In addition to the paid-up capital the company has in reserves and undivided profits over \$700,000."

"And what is the outlook for the future?" he asked. "If the shareholders and those whom they have placed in charge of the respective companies' business remain true to the principles and ideals which brought them into existence, they cannot fail to in-

crease in the right direction their power and influence in the commercial life of Western Canada. While it is always dangerous to enter the realm of prophecy it is not too much to expect that within the next 10 years the farmers of Western Canada will be operating their own saw mills and their own flour mills, possibly their own coal mines and meat packing plants, and may be caring for their own fidelity and fire insurance.

"There has, unconsciously, perhaps, been growing in the minds of farmers generally, a heightened self-respect for the work they are engaged in and a truer estimate of their position in society and of their importance in national development.

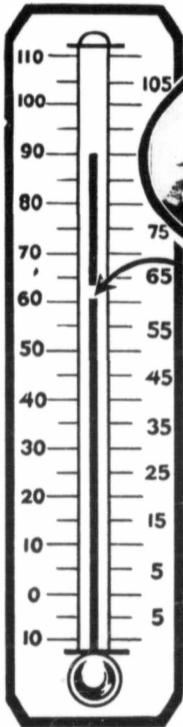
"The idea of thoughtlessly trusting to what is called luck, is giving way to the better method of trusting to intelligent thought and action. That this change which has gone on unconsciously, very important, though scarcely noticed, is due in great measure to the influence emanating from the meeting of men working together for a common cause cannot be questioned.

"Our farmers' organizations in and by this work have contributed powerfully to this end and this company to the extent that it has assisted in this, by promoting and aiding by financial help, or in any other way, has played a part by no means small in helping in this very important work. Let us all keep in mind that we are working not alone for what concerns our material advantage, important as that may be, but for the bringing about of a better and higher type of citizenship.

Directors elected for the ensuing year are: T. A. Crerar, John Kennedy, Wm. Moffat, R. McKenzie, J. F. Reid (Orcadia, Sask.), F. J. Collyer (Welwyn, Sask.), John Morrison (Yellowgrass, Sask.), F. M. Gates (Fillmore, Sask.), and J. W. Wood (Wainwright, Alta.).



About 500 Shareholders of the Grain Growers' Grain Co. Ltd. attended their Annual Meeting in Winnipeg recently



Temperature rarely above 90 or below 60 at Los Indios, Isle of Pines

Here vegetable growers, fruit planters and all-round farmers find health, wealth and happiness in supplying winter fruits and vegetables.

Los Indios, Isle of Pines, is a short distance from New Orleans and Florida, with climate ideal, soil fertile. No snow, frost, sleet or hail. No climatic uncertainty.

Los Indios grape fruit planters have netted up to \$800 per acre. Here peppers, egg-plants, tomatoes ripen for shipment during the winter season. Vegetable growers have netted \$365 to \$635 per acre. **Los Indios** has the only deep water harbor on the island—the **only Port of Entry for ocean liners**. Your produce is quickly transported at favorable shipping rates to the world's markets, where out-of-season prices await.

Talk to Canadian owners in your vicinity

Throughout Canada there are fruit and vegetable growers and farmers who are, through the ownership of a Los Indios farm, preparing to supply the increasing demand, and consequent high prices, for winter fruits and vegetables. Write us for their names.

Why not make yourself and your family the best gift of all—a Los Indios farm—where life is ideal and work pleasant and profitable—where your future is assured.

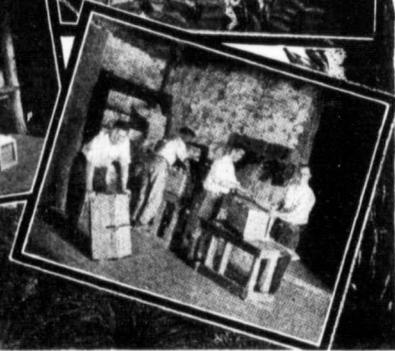
Let the past year's prosperity contribute toward establishing your winter home at Los Indios. Invest in a snug little Isle of Pines fruit and vegetable farm—where life is ideal and returns profitable.

E. G. ALLEN, Secretary

Cañada Land and Fruit Company

Room 232, 117 Wisconsin St.

Milwaukee, Wisconsin



THE WEED PROBLEM IN MANITOBA

Continued from page 5

ley, sheaf oats, or summer fallow, they have invariably controlled this troublesome weed.

How the Work of the Weeds Commission Has Been Received

With very few exceptions the weeds commissioners have been well received by the municipal councils and individual farmers, and they have very generally

acted on our suggestions and given us their hearty support and co-operation.

The weed problem is such a large one and so complex in character that without the hearty support and co-operation of the municipal councils, the weeds commission and the municipal weed inspector can do very little effective work, but by hearty co-operation all our weeds may be brought under control and many of them exterminated.

We are particularly anxious that only the best available men should be appointed as municipal weed inspectors, and, that they should receive their appointment by March first, thus giving the commission an opportunity of meeting them personally.

Every municipal weed inspector should be engaged for the full five months as stipulated in the Act and should spend his whole time at the work. One or two councils complained of the ex-

pense connected with the engagement of an inspector for the full five months as provided by the act, but when it was explained to them that the employment of an inspector for five months at \$100 per month by a municipality consisting say of six townships only amounts to 58 cents per quarter section, they decided that it was a very poor inspector that failed to save the price of a bushel of wheat on a half section farm.



THE LAWS CONCERNING WOMEN

The Political Educational League of Manitoba is bringing in some amendments to the laws of the province, in order to protect women and children. Of course there are a great majority of women in the province who do not need protection from the laws. Laws are made only to protect those who would otherwise be unjustly treated. In order that a law may be effective, it must have behind it, a great force of public opinion. This can only be the case when the majority of people do not need law to make them do what the law demands.

During the suffrage campaign in Manitoba, many people heard for the first time the kind of laws under which some women suffer, and men and women alike were shocked. The mere fact that the women of the province now have the franchise has not made any change in the laws. Those must be changed by amendments, and at the coming session of the legislature, the amendments given below among others will be proposed.

It would be well for the women of the West, as well as the Manitoba women to read these laws, and where possible make suggestions or changes that seem advisable. Send these suggestions and changes to Mrs. E. M. Harrison, Preston Court, Winnipeg, Manitoba, who is the corresponding secretary of the Political Educational League, and she will bring the matter before the association. It is important that these laws should be the very best possible laws to cover the injustices, and yet not create other injustices.

The women of the West are very anxious not to ask for anything that would not be fair to men and women both, for a real suffragist always works for the rights of both men and women and special privileges for none.

Women and the Homestead

One of the greatest injustices to married women at the present time is the fact that no married woman has any claim on the property of her husband. As things are now, a woman may marry and start on a homestead with her husband, neither of them having anything. She may work until she is old and worn-out and her husband may put her out and sell the place, mortgage it, rent it or like a case I know of, bring another woman in to live, and when his wife protested, he told her she could get out if she did not like it. She certainly did not like it, but she had small children, and she stayed. In another case, the husband gave all his property to his sons, and left his wife, who was a second wife, without anything.

The amendment the league proposes to bring in to the legislature is that the husband will not be able to sell the homestead, rent it, mortgage it, or dispose of it in any way without the consent of his wife. By homestead is meant any place in which the family live or have lived, be it in the country or in the city. This will leave the man free to deal in any way he likes with his other property if he has any, but insofar as the homestead is concerned, he will have to realize that his wife has an equal claim on that.

This is the same law as has been in force in Saskatchewan, and I heard of a case there where a man wished to sell his place, and his wife would not consent. In order to get around that difficulty, he bought another place and made a very small payment on it, and moved his family into it. Then, because in Saskatchewan the law defines

the homestead as the place where the family is living, he was able to sell his first homestead without his wife's consent.



Mrs. ALICE HOLLING

It is the intention to have the Manitoba law define the homestead as all places where the family have made a home. In this way, a man will not be able to sell any place in which the family have ever lived without the consent of his wife. It may be necessary for her to file a caveat, before, before she moves from any home, in order to show her claim. I cannot be sure about that, but in future wives had better make sure of their claim before they consent to move from the homestead, into a rented house. By the law, the husband will not have the power to rent his place, mortgage it, sell it, or dispose of it in any way without the consent of his wife in writing.

Of course, this law has not been yet passed, and if it is passed, it will not make the slightest difference to the men who are doing what is right for their wives and families. It will merely be protection for the women whose husbands have not yet begun to realize that a wife is a partner in the home and not a servant or a slave.

A number of organizations of women have already considered this amendment, and think it good. The Educational League has had five hundred cop-

ies of the amendments to be brought in, printed, and will send copies to any organization that wishes to have them. It is important, very important, that every woman in the province should know what is being proposed, and should help by advice, if they have anything better to suggest.

The other amendments provide that a man cannot will all his property away from his wife, that the mother has an equal right to the children with the father, and that an illegitimate child and its mother have legal rights as child and parent. The particulars I will give next month.

Women and the Municipal Franchise

Many women, especially women in the country, are protesting very strongly because the municipal franchise is a property franchise, and the most of the women not having any property in their name, have no vote. The women feel this, particularly in school matters, for there is no mother who is not interested in the school, and when it comes to having an indifferent school board and the women have no vote to make a change, it hurts.

Some of the meetings I have addressed, I have asked the audience what would be a good solution of this difficulty. Would they be willing to make the municipal franchise, a residence franchise and not a property franchise? That is, would they be willing to let every man

and woman who had a vote in the provincial elections have a vote in municipal affairs! I was surprised to find pretty strong objection.

As the first step to getting women into municipal affairs, the Political Educational League and the Women's Civic League, are making representations to the government asking that all municipal offices be open to women, as well as men. At the present time the only positions open to women are school trustees, which is not enough.

The civic election in Winnipeg was interesting, especially because the women secured the promise of practically every candidate, that, if put on the city council, they would favor granting the fullest privileges to the women. This being done, the women will soon do something about the municipal franchise.

In Saskatchewan, I understand, a law will be passed giving to the wives of the men who vote in municipal affairs, the same right. This, of course, leaves out the unmarried women, which is not fair.

Burbank and Tobacco

Luther Burbank, that wonderful man who has experimented with flowers and plants and trees, until he has produced most remarkable results, and is known all over the world as a plant wizard, loves his plants and has infinite patience with his experiments. Mrs. McClung, when giving an address on her trip in the United States, spoke of the cactus in Texas, with its long spines. She said the cactus made good food for the cattle, but before letting them eat it, men went around with torches and burned the spines off.

But she said that Luther Burbank had by his experiments produced a spineless cactus, a cactus that would add millions of dollars to the wealth of that country. But it was not the wealth added, because of this man's wonderful work, about which I wished to write.

It is said that Mr. Burbank will not have a man in his employ who uses tobacco. He says that a man who smokes has not the steady hand necessary to handle small and very delicate plants. It is an interesting thing to get proof on proof that morals are merely good economics. The church has long preached about the evils of intemperance, and some about the evils of tobacco, but tobacco and liquor stayed, and will stay until they are proven to be economically wrong. It is when men find themselves unable to get good positions because they smoke and drink that smoking and drinking will become really unpopular.

Edison, the great electrical wizard, also finds it necessary to have men who have not used tobacco, when he is experimenting, and steady hands are essential. This is not a story with a moral. It is merely a few facts.

Mother and Daughter Graduate Together

It is a sign of the times, and a good sign, when in the report of an examination, the names of mother and daughter appear together. But what a shock it would have given our grandmothers, or some of them at least! In those times when a woman was married, it finished her career, as anything but somebody's wife, or mother. She never had any independent existence after that. Not so the modern mother. She lives her life as somebody's wife and somebody's mother, and her own as well, and lives it well.

Mrs. Holling and her daughter Clara, are Canadians by adoption. Ten years ago Mr. Luther Holling decided that in

Continued on page 38



Miss CLARA HOLLING



FREE TO COMPLETE HOCKEY OUTFIT

BOYS—Don't pay \$2.00 or \$3.00 for a hockey outfit, when you can get, **ABSOLUTELY FREE**, this magnificent outfit complete, consisting of a pair of padded, strong, polished steel, hockey skates (all sizes), a good lively puck, and a strong, well-made rock rim hockey stick and in addition every boy can secure as an extra present, a dandy pair of well padded hockey gloves with fingers and wrists protected by cane splints covered with leather, or a pair of strong, heavy hockey boots with specially padded uppers and reinforcements across the instep. **WITH THIS SPLENDID OUTFIT YOU WILL BE THE BEST EQUIPPED PLAYER ON THE TEAM.** Write to-day—before you forget, and we will address: **REGAL MANUFACTURING CO.**

send you by mail just **30** handsome bottles of our delightful floral Sarsaparilla. Perform to sell among your friends at only 10 cents a bottle. Six different odors—White Rose, American Violet, Lilac, Geranium, Heliotrope, etc.; no trouble at all to sell; everybody wants two or three bottles. You will sell them all in an hour. Then return our **\$3.00** and you will receive at once, the complete hockey outfit of fine quality skates rubber puck and hockey stick which gives you the opportunity to also win the additional present of fine hockey gloves or hockey boots without selling any more goods. Hurry boys! We arrange to stand payment of all charges on your outfit right to your door under our reimbursement plan.

DEPT. H. 44 TORONTO, ONT.

a new country he would have opportunities not possible in England, and he decided to try his luck in Canada. He was more fortunate than many men who wish in middle life to make a change, in having a wife, just as ready for adventure, as he was, and just as brave to bear any hardships there might be.

Mr. and Mrs. Holling and Miss Holling and Babs, or Barbara, the other member of the family, have made what we call "good" in Canada. They came to Manitoba, not with the idea of being English for ever and ever, but with the intention of being Canadians and giving of their best to the country of their adoption, and their best has been no small contribution. Mrs. Holling was a very active worker in the suffrage campaign that ended in the granting of the franchise to women. Miss Holling was also a keen suffragist, and her sweet voice has helped to make many a suffrage meeting a success.

After the suffrage was assured, Mrs. Holling, with the new vision women get of service, looked around her, to see in what way she could best contribute to the well-being of her city. After mature consideration she decided that in this new country with great immigrant population coming in every year, most of them quite ignorant of our sanitary laws, that a woman could do a great work in helping the foreign women to conform to the requirements of a modern city, in the care of their homes and children, and she could give many another hint, that would help in the Canadianizing of those who seek a home and freedom here.

Undaunted by the fact that in order to be a sanitary inspector, one must study hard, and for a long time, Mrs. Holling declared her intention of taking a course that would give her a degree from the Royal Sanitary Institute, London, England. Clara decided to take the course with her mother, and to work mother and daughter went. Night after night they attended classes, and night after night they poured over books on sanitation, both at the same time doing their regular work, for Miss Holling is a stenographer, and Mrs. Holling did her own work in the home, and much work in women's organizations outside of her home, and kept up this work while taking the course. Mrs. and Miss Holling have not yet secured their certificates from London, but the local examiners have given them both great encouragement to believe that it is but a matter of time. When the certificates come, it will mean that these two women have secured certificates good in any British dominion, and certificates that will be recognized in other countries.

Mrs. and Miss Holling have made a new trail for women in Canada, and if they are given appointments, there is no doubt in the minds of those who know them, that it will be a fortunate day for those securing their services.

Rural Hospitals Needed

From month to month, on this page I have been dwelling on the need of free rural hospitals. I have also told what Alberta and Saskatchewan are doing along this line. Manitoba is the only prairie province that is not agitating for more hospitals. This may be due to the fact that in this province which is older and not so large as the other prairie provinces, there is more hospital accommodation. There is not, however, free hospital service, which is greatly needed.

In a rural district in Saskatchewan, where I once taught among foreigners, they were discussing the problem of engaging a doctor for the district. The plan was that each would pay a voluntary tax, and the doctor would have a salary. He would live in the district, and give his services to whoever was in need. The doctor obtainable, in those good times, so far as I could find out, was a man addicted to the flowing bowl, and who, in self-protection, was willing to isolate himself in a small country district in order to escape temptation.

It seems to me that those people were ahead of most prairie people, and they were introducing a system that will have to be followed, with the exception of the voluntary tax. It is not economic to tax the man who is unfortunate, because he is unfortunate, which is just what is being done at the present time.

TO INVESTORS

THOSE WHO, FROM TIME TO TIME, HAVE FUNDS REQUIRING INVESTMENT MAY PURCHASE AT PAR

DOMINION OF CANADA DEBENTURE STOCK

IN SUMS OF \$500, OR ANY MULTIPLE THEREOF

Principal repayable 1st October, 1919.

Interest payable half-yearly, 1st April and 1st October by cheque (free of exchange at any chartered Bank in Canada) at the rate of five per cent per annum from the date of purchase.

Holders of this stock will have the privilege of surrendering at par and accrued interest, as the equivalent of cash, in payment of any allotment made under any future war loan issue in Canada other than an issue of Treasury Bills or other like short date security.

Proceeds of this stock are for war purposes only.

A commission of one-quarter of one per cent will be allowed to recognized bond and stock brokers on allotments made in respect of applications for this stock which bear their stamp.

For application forms apply to the Deputy Minister of Finance, Ottawa.

DEPARTMENT OF FINANCE, OTTAWA
OCTOBER 7th, 1916.

The weak, who are under a handicap because of that weakness, are exploited by doctors, druggists, hospitals, nurses, and others. Not that these people wish to do so, but in order to live they must do so.

A man gets hurt. It is an accident. He has to have a doctor. That is, he is forced to pay a tax as well as suffer and be off work. He must also pay the druggist, the nurse, the hospital, the grocer for special food, the dry-goods man for special clothes, and all the time his efficiency as an earner has been impaired, and he is not able to work and can do nothing to prevent the expenses he is incurring.

It is said that when the king of the buffalo herd shows signs of weakness the whole herd turn on him, and unless he is able to get away, will gore him to death. He may live, but from that time he is ostracized.

Men, in their treatment of the weak, have gone but little beyond the law of the herd. While a man is strong and well, all goes fine, but let him get sick, and unless he has great reserves, his pockets are soon emptied, and while he is not gored to death, but instead the whole effort of society is apparently to restore him to health, in the process his financial position is pretty well gored. He is relieved of the savings of years,

Manitoba Winter Fair and Fat Stock Show

MANITOBA POULTRY SHOW
Brandon, March 5th to 9th, 1917

The Directors are pleased to announce that the Winter Fair Buildings are again available for holding the Manitoba Winter Fair. The Standard of the last Fair in 1914 will be amply sustained. Classes for all Breeds of Horses, Grade Beef Cattle, Sheep and Swine and Poultry.

J. D. MCGREGOR, President.

W. I. SMALE, Secretary.

Make More Money on Furs!



Make more on your furs by sending them to us. Our prices are famous amongst hunters and trappers all over the country. We were the first to get out a classified price list that lets you know exactly what to expect for your furs. We make no deductions from published prices on any pretext of commission, transportation, etc. Liberal grading. Prompt returns. Will collect and keep furs separately when requested. Write today and get on our mailing list. Then you will be kept informed of the market so no one can take advantage of you. We are in manufacturing centers and have old established outlets. Our foreign connections are still active.

Becker Bros. & Co. Dept. 26, 416 N. Dearborn St., Chicago Dept. 25, 329 W. 29th St., New York



Officer—"Very dirty turn-out, Sergeant. Look at that man—he's not clean.
Sergeant—"Well, Sir, it ain't as if they don't wash themselves, but, what-a-mean-ter-say, some o' these 'ere men they dry dirty!

and sometimes to the weak the struggle does not appear to be worth while.

A free hospital with free services of doctor and nurses would help the man who is down, and if it was supported by a general tax it would enable both weak and strong to contribute their share to the good of all. This is a change that must come sooner or later, and the sooner the better. The awful drag of a hospital and doctor's bill, must be taken from the shoulders of the unfortunate and put on the shoulders of all.

Misdirected Talent

Elderly lady visitor, to young hostess: "This cake is extremely nice, my dear; did you make it yourself?" Young hostess: "No; indeed I don't intend to try making any more cakes, because my husband broke a tooth over my last one, and suggested that I might find a profitable employment making munitions!"

Our Women Folk

HOME ECONOMICS

While talking with Mrs. Dayton, of Virden, last month about the work of the Home Economic Societies, she impressed me with the fact that the name is a great hindrance to the progress of the organization, inasmuch as all women are anxious to do patriotic work and they feel that the name of the society does not convey a patriotic meaning. This is a great pity, as the idea of the work, as planned by the Agricultural College, emphasizes patriotism first in every sense of its meaning.

The multiplication of societies in small towns robs the patriotic work of results that one good strong organization could realize, and since the slogan of the Home Economics' Society is "For Home and Country," the ambition of the object is broad enough to cover all phases of patriotic work. We hope that the organization will soon change its name to fit its meaning—for after all "there's much in a name." I asked Mrs. Dayton if she would write an explanation of "Why the name Home Economics should be changed," as our readers have such profound admiration of Mrs. Dayton for her splendid work in the interests of the organization, I am sure they will appreciate this explanation from her:

Why the Name "Home Economics" Should be Changed

1—Because the present name only represents that part of the work in which the organization is assisted by the Agricultural College. It, in one way, indicates the scope of the activities of the organization in its broader sense.

2—Because in many places the Home Economics Societies have not been able to do the work they should through their own organization on account of the name limiting the scope of the work. In the minds of the people this is especially true in reference to Red Cross and other patriotic work, and has tended to multiply other organizations which, in small places, is fatal to community effort, as well as injuring the Home Economics Society.

3—A—Because the name is misleading to many who call it the "Home Economy" Society and will have nothing to do with it on that account, saying they already have all the Home Economy they wish.

B—Because the first societies were all organized under the name "Woman's Institute" and were later changed through the influence of the heads at that time of the College to the "Home Economics" Society, when we were weak and did not realize all the change implied.

4—Because one of our greatest needs is a wider vision, and our present name tends to circumscribe our view.

5—Because it is a source of weakness to have different names in the different provinces. This is a national organization and it would strengthen it and help the whole body to do as other national organizations do—have the same name throughout the Dominion as instanced by the W. C. T. U. and The Daughters of the Empire.

If we are to have one name, Dominion wide, I believe it will have to be "Woman's Institute."

1—Because this name in Ontario alone has a membership of thirty-five thousand.

2—Because Ontario, New Brunswick, Nova Scotia, Prince Edward Island, Alberta and British Columbia have already adopted the name "Woman's Institute," as did Belgium and France, where the organization was introduced before the war.

3—Because of its associations, being the first name given in Ontario over twenty years ago, but more particularly on account of the splendid work accomplished where the "Woman's Institute" is used.

4—Because the "Woman's Institute" of Ontario are doing their patriotic work through their own organizations while the "Home Economics" Societies of Manitoba have to do much of theirs through other organizations supposedly more patriotic, thus helping to give them the credit which should have been ours. Our motto is "For Home and Country." Could anything be more patriotic?

5—Because a uniform name would link us up more closely with the other

PURITY FLOUR

More Bread and

Better Bread



The Power Behind the Cook

40

provinces of the Dominion. This would be of great educational value and also tend to promote and cultivate a broader sympathy and a better understanding between the women of the East and the women of the West. Then, following the example of the Woman's Institute of Ontario, the whole body would be affiliated with the National Council of Women and in this way could be represented in the International Council, and then with the women of the world use our influence that war shall perish from the earth, and that our mother's hearts shall never again be broken by an emperor's ambition.

Very sincerely yours,
REBECCA DAYTON.

I think our societies should rouse themselves and take more interest in the schools. I would urge greater co-operation with the school trustees and teachers. If you have not got a woman on the school board, elect from your society a committee of three interested women to co-operate with the trustees.

At local trustee conventions the Home Economics Societies should be present and show interest. In some places a lunch is provided. This helps to bring the people interested together. There are great possibilities for good work here.

Without a doubt the short courses are good, but we need just as badly assistance from experts in home and village sanitation. The value of organized play, the necessity of physical culture, music and cultural training is enormous. More attention should be paid to the manners of our children.

We need education along the lines of better citizenship. We have the suffrage; we need help to use it intelligently.

We in the country need to learn that there is a national circulation as well as

physical, and if one of the smallest members is injured, it is a hurt to the whole body. We need greater co-operation and less selfishness.—R.D.

The following letter from Mrs. Nellie L. McClung to the H. E. S. of Manitou will equally interest all members of the organization—for her message to the Manitou women is meant for all who know her. We are pleased to have her letter for publication. God bless Nellie L. McClung for her sincerity and her heart that is filled with love for all woman-kind.—P.R.H.

To the H. E. S. of Manitou

Dear Friends:—Last Thursday night it happened that I was in Moose Jaw speaking for the Ladies' Aid of St. Andrews church. Just before the meeting a telephone message came from Mrs. Coatesworth, telling me that her mother, Mrs. C. H. Brown, was living in Moose Jaw now with her and would like to see me. The next morning we went to see Mrs. Brown and found her settled very comfortably in her daughter's pretty home on Willow Street, whose southern windows command a splendid view of the city. It was a warm and sun shiny morning and only the fallen leaves and frosted flowers gave evidence that the summer had gone.

Mrs. Brown was very bright and cheerful and spoke lovingly of all of you, and showed me the kind letter of appreciation, written by Mrs. Rowe, on behalf of the society, and which is evidently one of her cherished possessions.

Though Mrs. Brown's hands are idle now, her brain is as busy and active as ever and she cherishes great ambitions and hopes for the emancipated women of the West.

We recalled the old days when the H. E. S. was started; the organization meeting at Mrs. McNamara's—that snowy day—the splendid meetings which followed in the Normal school, where we discussed everything from the curing of meat to the training of children. This was in the good old days of peace, which seems so long ago now, and in looking back we wondered if we ever had a cause to worry then; we spoke of the splendid work the Manitou women had done for the Red Cross and in sending comforts to the soldiers, while still maintaining the rest room. While the work abroad has increased so much, there is a greater need than ever at home, which lays a heavy burden on us all; never before in the history of the world were such heavy responsibilities placed upon the women and never was there a more noble response to duty's call. Out of the noise and confusion and terrible destruction of war, there comes a new sense of the sisterhood of women which finds expression in the message which the women of Germany sent, not long ago, to the women of France:

"We think, feel and suffer just like you, and when this catastrophic war is over, we swear that we will work unitedly with the women of the world to prevent its recurrence."

This is an expression of the new spirit among women which is going to break the narrow bonds of creed and country and bring about a citizenship which knows no geographical boundaries, but is wide as the world. Women must learn to stand by each other and claim their true place in the direction of the world's affairs.

When the woman's point of view has to be considered, then human life and

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Elite Hairdressing Parlors

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happiness will have to be respected and no more will disputes be settled by the brutal senseless way of shedding innocent blood.

While we fight this terrible battle against military despotism, one thought sustains us, and that is, if we fight it to a successful issue now, it will never need to be done again. This is a war against war—a conflict whose outcome will be life and peace and the safety of the little nation, and as such is worthy of the greatest sacrifices we can make.

But in order that all this may come about, women must be preparing for the great new problems which peace will bring. We were unprepared for war; let us not be unprepared for peace, for if women do not assert their right of having a part in the government of the world, what guarantee have we that men will do better in the future than they have done in the past? We know they have done their best, but alone, it seems, they cannot free the world from the curse and blight of war. Richard le Gallienne puts it well in his recent poem on "Women and War" when he says:

"Ah, battles worthy of the soul to fight, Thou shalt not lack for still the ancient night

Girds us about, and slowly climbs the morn.

For these, oh women, mighty is our need, Of men to do a more courageous deed,

Than rushing blindly on an open grave;

Teach us nobler ways of being brave— And other harder ways of being strong, Rear us up sons and rear us daughters,

too,

O women, for we have no help but you, To dare new conflicts with new ways of

WAGING."

This is the message Mrs. Brown — your first president — asked me to send you, and as you read it, I hope you will be able to see her, as I saw her, sitting there in her daughter's pleasant living room, bright with sunshine and beautiful flowers, and surrounded by every comfort that love can devise.

She looks serenely into the future with the same undaunted spirit with which she met all the experiences of life, and glorified them with her unwavering optimism. In the days of her strength

she labored unceasingly, hopefully, abundantly, and now, when days of inaction have come to her, and the shadows lengthen, she has all the joy of the honest workman who needs to not to be ashamed. She has done a long, successful day's work and rest has come at evening.

She sends you her kindest and most loving wishes for your continued activity in all that makes for happiness in home and country, to which I add my own.

With kindly memories of you all, Sincerely yours,

NELLIE L. McCLUNG.
Regina, Oct. 13th, 1916.

NOTICE

This department would like reports of the patriotic work the Home Economics Societies are doing. Make this a forum for the work you are doing. I am sure the reports will be an encouragement and inspiration to all societies. Let us have at least fifty reports for the March number.—P.R.H.

THE ISLE OF PINES

Exactly a year ago we published in these pages some illustrated details of the Isle of Pines, from which we quote the following:

The soil and topographical features of the Isle of Pines leave nothing to be desired, but its great asset seems to be its wonderful climate. Friends who have lived there, and who now own considerable property on the Island, declare that it is hardly possible to overstate the equable character of the climate. It is scarcely credible to the dweller on the prairie who has had his or her lifelong experience between the extremes of heat and cold. Here the temperature seldom rises above 90 deg. and seldom falls below 60. The average for the year is 72. Frost, snow, sleet, ice and all disagreeable changes of the weather, such as we know of in Canada and the United States, is unknown here. It is cooler at Los Indios — a port which enjoys the only deep water harbor on the Island — during July and August than in the cities of the United States.

Every day is a growing day. Planting and harvesting goes on during every one of the twelve months. Two and three crops of vegetables are taken off yearly. The dry bracing air and the invigorating sea breezes make Los Indios an ideal place of residence. Many sufferers, even from malignant diseases, have found health here, and yellow fever, malaria and typhoid are entirely unknown.

Since publishing the above we have seen and heard from other friends who have lived for some time in Los Indios, and their further testimony confirms what we stated in our descriptive article of January, 1916. Recently some adverse criticism has appeared in a contemporary, also from men who have lived on the Island. We have been at some pains to get at the record of these men in so far as their operations on the Island is concerned, with the result that they do not incline us to make the slightest reversal of anything we have said.

Taking it all round, there's no finer place on the face of God's earth than Western Canada, and we will spend the remainder of our days in boosting it

Closing-Out Sale



Of Perfect but Slightly Used

High Grade Pianos and Player Pianos

For quality and value in splendidly toned musical instruments, the following numbers have never been surpassed (if equalled) in any bargain sale record.

USED KARN PIANOS

- 1 Style B Mahogany, regular \$400, now.....\$250
- 1 Karn-Player, 88 Note Mission \$750, now.....\$500
- 1 Karn Grand, Mahogany, \$700, now.....\$475

USED MORRIS PIANOS

- 1 Style L, Walnut, regular \$350, now.....\$225
- 1 Style 15, Mahogany, regular \$450, now.....\$290
- 1 88-note Morris Player, Walnut, regular \$650, now.....\$475
- 1 88-note Morris Player, Mission, regular \$650, now.....\$450
- 1 88-note Morris player, Mahogany, reg. \$650, now.....\$450
- 1 Williams Piano, Walnut, regular \$350, now.....\$200
- 1 Angelus Piano, Mahogany, regular \$400, now.....\$200

We are closing out our retail business here, and are making these sacrifices in order to make a clean sweep before handing over keys to the incoming tenant

ACT PROMPTLY TO SECURE YOUR CHOICE

Karn-Morris Piano & Organ Co. Limited
282 Graham Avenue, Winnipeg, Man.

Painless Dentistry

Entrance Changed from Portage Avenue to Smith Street. Take the Elevator at Smith Street Entrance to Dr. Robinson's Dental Specialist

I am the originator of the celebrated Whalebone Plate. When made by me it represents a distinct advance beyond anything previously offered to the public. The teeth are so natural in appearance that detection is impossible.

Have You Tried One of My Sets of Celebrated Whalebone Plates?

What It Means to You

The celebrated Whalebone Plate, the great discovery that has stood the test for years. The lightest, strongest and best plate known; fits any mouth; never drops; no noise when chewing; nearer natural formation of mouth than any artificial plate known; bites corn off the cob; is clean; no bad taste in the mouth. Guaranteed for 20 years. Worth \$25.00. Our price \$10.00.

TEETH WITHOUT PLATES



New System Teeth Without Plates

I make a specialty of gold and porcelain bridge work. This is without doubt the most beautiful and lasting work known to dental science. Spaces where one or more teeth have been lost, we replace to look so natural that detection is impossible. Ask to see sample of this beautiful work. I guarantee my work, not alone against breakage, but satisfaction for 20 years. My personal attention given all work; honest methods. Written guarantee with all work. Price \$7.00 per tooth.

Over Birks' Jewelry Store. Portage Avenue and Smith Street

Teeth Without Plates at Prices Within the Reach of All

All languages spoken. Free examination. All work guaranteed for 20 years. Oxygenated gas for painless operations. Easy, sweet and harmless as the sleep of Nature. Sumiform Anesthesia quick and pleasant. Lady attendants. I have testimonials from doctors, lawyers, merchants and laboring men as to my painless methods. High class work and courteous treatment.

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"I earn \$2 a day at home"

You may say that, too—if you want more income. Easy to learn. Steady work at home the year round. Write Auto-Knitter Hosiery (Canada) Co., Ltd. Dept. 311 P. 257 College St., Toronto.

last kindly environment. But there are drawbacks to Western Canada just as there are to the most tempting morsel this earth offers. Among these are certain climatic specialties and the fact that every honest man who would earn a living and save a bit of money has to work desperately hard to do it. Lots of honest men who have paid the price in many arduous years are seeking a rest and a retreat. For the benefit of such we are glad to give what publicity we can to the Isle of Pines, and would say that if any reader of this magazine is seeking light on any feature we have not touched upon or may wish to have further evidence than we have supplied, we shall be happy to reply in detail to anything of the kind.



FRANK D. BLAKE

It is with considerable regret that we chronicle the death of Frank B. Blake, who for some time has been director of publicity for Deere & Co., Moline, Ill., who died at his home in Moline on December 21st.

Mr. Blake has probably done more for agricultural advertising than any man living to-day. He had worked out a system of agricultural publicity that was second to none, and the success of Deere & Co. in the agricultural implement field has been due in no small extent to Mr. Blake's publicity.

Apart from his ability as an advertising man, it was a gentleman to know Mr. Blake. He was a gentleman through and through. His death causes a great loss, not only to the community in which he lived, but to the ranks of agricultural publicity.

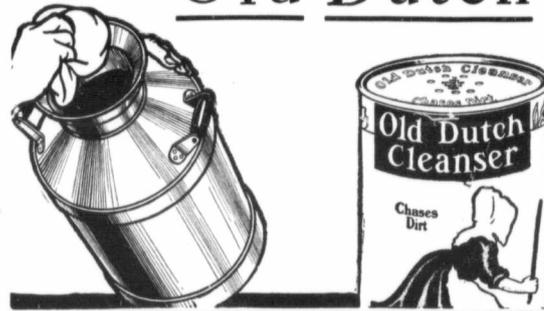


THE ONLY WAY

Boots: "Ye'll hae tae get up, sir. There's twa tourist chaps come in for breakfast, an' your sheet's the only tablecloth in the house."

Every milk can will be sweet and sanitary if you always use

Old Dutch



FIVE ROSES FLOUR FOR BREADS - CAKES - PUDDINGS - PASTRIES



Crisp, Crackling COOKIES and a glass of milk—taste the delicious blend of flavours.



SAVORY & MOORE'S BOOK

Messrs. Savory & Moore, Chemists to The King, and makers of the well-known Infants' Food, issue a little Book entitled "The Baby," which gives a great deal of useful information on the Care and Management of Infants.

A USEFUL GUIDE
The book contains hints on Feeding, Teething, Development, Infant Ailments, and such matters as Sleep, Exercise and Fresh Air, which are so important for baby's well-being. It also contains a chart for recording baby's weight, a dietary for older children, and recipes for simple nourishing dishes. It forms, in fact, a useful mother's guide, which should find a place in every home. It is not intended to take the place of medical advice, when such is needed, but it will often serve to allay needless anxiety, and indicate the right course to be pursued.

FREE TO MOTHERS
Those who are genuinely interested in the subject may obtain a free copy of the Book by sending name and address on a postcard to Savory & Moore, P.O. Box 1601, Montreal.



FREE FAIRY PALACE DOLL HOUSE, 5 BEAUTIFUL DOLL TOYS AND "PRINCESS PAT" DOLL

Just think girls we will give you all these grand presents absolutely without cost. First The big beautiful Fairy Palace Doll House, so big and roomy that it will hold a whole family of dolls; then a real Wash Tub of 14 pieces, consisting of wash tub, wash board, wringer, iron and stand, big clothes basket, clothes line and a little case full of dolly clothes pegs; then you get five pieces baking set, and the cute little French blue baby doll that you'll just love. Next comes baby doll's lovely enameled bed with its canopy and the beautiful baby doll carriage you see above, handsome as can be with its fine paracel and bright metal finish. Last but not least, every girl can get the lovely big "Princess Pat" dressed doll—over 18 inches high. It's a "made-in-Canada" beauty, with unbreakable head and she is dressed completely from head to foot, real shoes, stockings, undershirt, etc., and she has many different styles of dresses.
Write to-day and we will send you Free a big sample package of Fairy Berris, the lovely new Cream Candy Coated Breath Perfume. We want you to try them and learn how delicious they are. With your sample we will send you 30 handsome big packages to introduce among your friends at only 10c each. That's easy. Open your sample package and ask everyone to try a Fairy Berry. Everyone just loves them—they perfume the breath, purify the mouth and leave a delightful lasting fragrance. Everyone takes a package or two at once, so you will sell them all very quickly. Then return our money only \$1.00, and we will promptly send you the big Doll House, complete wash set, baking set, baby doll, doll bed, doll carriage, just as you see them, and the lovely big "Princess Pat" doll you will also receive for simply showing your grand presents among your friends and getting only three of them to sell Fairy Berris and earn our lovely premiums as you did.
Write to-day girls—We arrange to stand payment of all delivery charges; if you can't tell all the possibilities we will take them back and give you presents for what you do sell.
Address THE FAIRY BERRY COMPANY, DEPT. B. 80 TORONTO, ONT. 15c.

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TAKE 20 YEARS TO PAY

The land will support you and pay for itself. An immense area of the most fertile land in Western Canada for sale at low prices and easy terms, ranging from \$11 to \$30 for farm lands with ample rainfall—irrigated lands from \$35. Terms—One-twentieth down, balance within twenty years. In irrigation districts, loan for farm buildings, etc., up to \$3,000, also repayable in twenty years—interest only 6 per cent. Privilege of paying in full at any time. Here is your opportunity to increase your farm holdings by getting adjoining land, or secure your friends as neighbors. For literature and particulars apply to

ALLAN CAMERO'S, General Supt. of Lands, Desk 17, Dept. of Natural Resources, O.P.R., CALGARY, ALTA.

SYNOPSIS OF CANADIAN NORTHWEST LAND REGULATIONS.

THE sole head of a family, or any male over 18 years old, may homestead a quarter-section of available Dominion land in Manitoba, Saskatchewan or Alberta. Applicant must appear in person at the Dominion Lands Agency or Sub-Agency for the District. Entry by proxy may be made at any Dominion Lands Agency (but not Sub-Agency), on certain conditions.

Duties—Six months residence upon and cultivation of the land in each of three years. A homesteader may live with nine miles of his homestead on a farm of at least 80 acres, on certain conditions. A habitable house is required except when residence is performed in the vicinity.

In certain districts a homesteader in good standing may pre-empt a quarter-section alongside his homestead. Price \$3.00 per acre.

Duties—Six months residence in each of three years after earning homestead patent; also 80 acres extra cultivation. Pre-emption patent may be obtained as soon as homestead patent, on certain conditions.

A settler who has exhausted his homestead patent may take a purchased homestead in certain districts. Price \$3.00 per acre. **Duties**—Must reside six months in each of three years, cultivate 80 acres and erect a house worth \$300.

The area of cultivation is subject to reduction in case of rough, scrubby or stony land. Live stock may be substituted for cultivation under certain conditions.

W. W. GORTY, C.M.G., Deputy of the Minister of the Interior.

N.B.—Unauthorized publication of this advertisement will not be paid for.—42828.

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SEED GRAIN

Purchasing Commission

This commission, appointed by the Dominion Department of Agriculture, has for its aim procuring a supply of clean, sound seed grain to meet the requirements of municipalities, farmers and farmers' organizations, in the districts affected by rust, hail and frost.

All seed grain purchased and distributed by the commission is handled at the Government interior terminal elevators at Moose Jaw, Saskatoon and Calgary. It is all inspected by the seed inspection staff of the Seed Branch, Dominion Department of Agriculture, when purchased and again when cleaned for shipment and it must conform to the following standards:

No. 1 Canada Western seed oats shall be composed of No. 1 or No. 2 C. W. oats, shall contain 95 per cent of white oats, sound, clean and free from other grain; shall be free from noxious weed seeds within the meaning of the Seed Control Act, and shall weigh not less than 34 pounds to the bushel.

No. 3 Canada Western seed barley shall be composed of the six-rowed variety, sound, plump and free from other grain, of fair color, free from noxious weed seeds within the meaning of the Seed Control Act, and shall weigh not less than 45 pounds to the bushel.

WHEAT—Class 1

No. 1 Manitoba Northern seed wheat shall be composed of at least 85 per cent of Red Fife or 85 per cent Marquis wheat, sound, clean and free from other grain, and free from noxious weed seeds within the meaning of the Seed Control Act, weighing not less than 60 pounds to the bushel.

WHEAT—Class 2

No. 2 seed wheat shall be composed of grades No. 2 Northern, No. 3 Northern or No. 4 slightly frosted wheat of Red Fife or Marquis variety, and when re-cleaned shall be practically free from other grain and noxious weed seeds, and the weight not less than 58 pounds to the bushel.

For Class 1 and 2 seed purposes Red Fife and Marquis wheat shall be kept separate. (Within the meaning of the Seed Control Act, means: Not more than one noxious weed seed per pound of grain.)

The commission will require a large quantity of seed oats and, until further notice, which will be made two weeks in advance, will accept delivery of all No. 1 Canada Western seed oats inspected into any of the Government interior terminal elevators and, on day of purchase, pay therefor a premium of five cents per bushel over the closing price for that day on the Winnipeg Grain Exchange, less the adjusted charges for freight.

Orders for seed grain will be filled for municipalities, farmers and farmers' organizations, and when filled are subject to payment by bank draft.

All seed purchased and distributed under Government weights, grade and Seed Branch inspection, and cleaned at the interior terminal elevators, Saskatoon, Moose Jaw and Calgary.

The price charged for seed grain is the purchase price plus the cost of handling, which includes the premium of not more than five cents per bushel, shrinkage in cleaning, elevator charges and sacking if required. The expenses of the purchasing commission and the seed inspection are not charged against the seed.

For particulars write:

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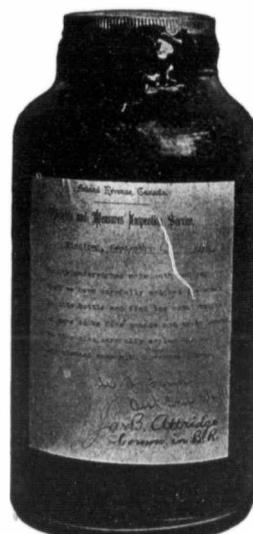
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FOR ESTIMATING THE CORRECT OR NEAREST CORRECT NUMBER OF KERNELS IN THIS BOTTLE

NOW IS THE TIME TO GET BUSY if you want to win one of the handsome Cars we are giving away **FREE**. It matters not whether you are a man or woman, young or old, if you live on a farm in Manitoba, Saskatchewan or Alberta and send your subscription, new or renewal, into this office now, together with your estimates, you have an excellent opportunity to win a splendid 1917 Model Ford Touring Car.

HOW TO WIN A CAR

We will present a handsome **FORD TOURING CAR** (1917 model) to the first reader of The Canadian Thresherman and Farmer, in each of the three prairie provinces—Manitoba, Saskatchewan and Alberta—who estimates nearest to the number of whole kernels in **5 POUNDS AND 7 OUNCES OF NO. 1 NORTHERN WHEAT, BETWEEN the 15th OF SEPTEMBER, 1916, AND 1st APRIL, 1917**. The wheat is a fair clean sample of No. 1 Northern, grown in Saskatchewan, and weighs 64 pounds to the bushel. It was obtained from the Dominion Grain Inspector at Winnipeg. The wheat and bottle were taken to the Dominion Weights and Measures office, and exactly 5 pounds and 7 ounces were weighed out and poured into same. The bottle was then immediately sealed up in the presence of two witnesses, photographed, and deposited with the Union Trust Company of Winnipeg. It will remain in their vaults until the contest closes, 1st April, 1917, 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.



THIS BOTTLE CONTAINS FIVE POUNDS AND SEVEN OUNCES OF NO. 1 NORTHERN MARQUIS WHEAT



These Three Splendid Cars go to the Winners---FREE

POINTS TO REMEMBER

- (1) The bottle contains 5 pounds and 7 ounces of No. 1 Northern Wheat.
- (2) It is Marquis Wheat grown in Saskatchewan weighing 64 pounds to the bushel.
- (3) The wheat is drawn from exactly the same sample as was used in our last contest.
- (4) The contest positively closes on 1st April, 1917.

A HINT TO CONTESTANTS

Frank B. Snyder, of Elkhorn, Manitoba, headed the last competition with an estimate of 47,038 kernels—the actual number of whole grains in the bottle being 47,037. The bottle on that occasion contained three and one-quarter pounds of No. 1 Northern Wheat, which weighed 64 pounds to the bushel. The grain in the present contest also runs 64 pounds to the bushel, the only difference being the amount of wheat used, which is five pounds and seven ounces in place of three and one-quarter pounds.

HERE IS THE WINNER OF OUR LAST BIG AUTOMOBILE CONTEST



YOU CAN WIN IF YOU TRY

FRANK B. SNYDER of Elkhorn, Man., with his wife and family in the handsome car he won in our last competition

HOW TO SEND YOUR ESTIMATES

Everyone who sends us a subscription direct to this office between the dates mentioned, for The Canadian Thresherman and Farmer, either new or renewal, is entitled to estimates as explained below. These estimates may be credited in whatever way you desire, and you may send in as many estimates as you wish in accordance with the schedule below. Remember every additional estimate increases your chance to win a car. Estimate now and increase your chance of winning, because it is the first one in each province who estimates nearest to the number of whole kernels that wins an automobile. Estimates will be accepted as follows:—

- 1 year's subscription at \$1.00 gives you 3 estimates
- 2 years' subscription at \$1.50 gives you 7 estimates
- 3 years' subscription at \$2.00 gives you 11 estimates
- 4 years' subscription at \$2.50 gives you 15 estimates
- 5 years' subscription at \$3.00 gives you 19 estimates
- 6 years' subscription at \$3.50 gives you 23 estimates
- 7 years' subscription at \$4.00 gives you 27 estimates
- 8 years' subscription at \$4.50 gives you 31 estimates
- 9 years' subscription at \$5.00 gives you 35 estimates
- 10 years' subscription at \$5.50 gives you 40 estimates

Why not increase your chance of winning a car, by sending in more estimates? All you have to do is to donate—say five subscriptions to five of your friends, using the additional estimates obtained in this manner yourself. You may not wish to donate five, however—well, donate three, two or one if you wish, but send them all in to us in one envelope.

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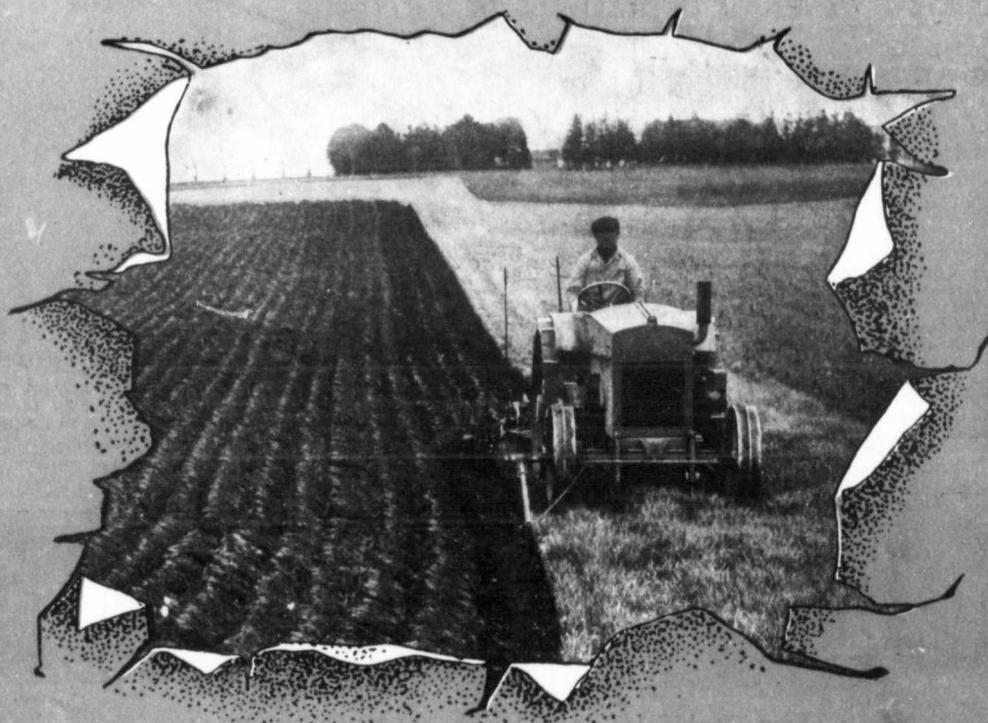
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Please find enclosed \$..... for.....years' subscription for **The Canadian Thresherman and Farmer**, to be sent to Name

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My estimates as to the number of whole kernels in 5 lbs. 7 ozs. of No. 1 Northern Wheat are

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The Case 9-18 is proving a *sensation*. These tractors are being delivered to farmers *just as fast as they can be built*. Wherever the 9-18 tractor has been demonstrated farmers have been quick to welcome it. *It has stood up under the most trying field conditions*. The 9-18 is a tractor built for *day after day, season after season service*.

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So many good features are found in the Case 9-18 that space does not permit of full description. But we want *you to know all about this tractor sensation*. So just drop a card and let us give you all the facts.

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