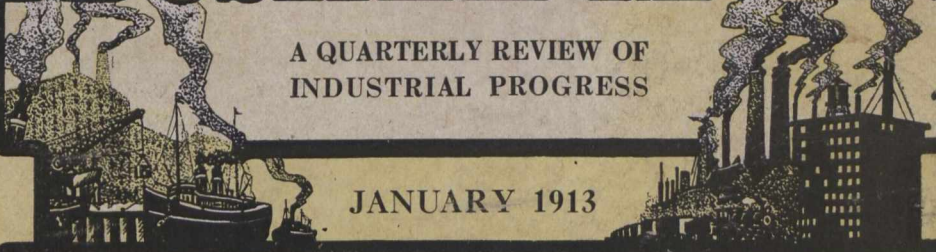


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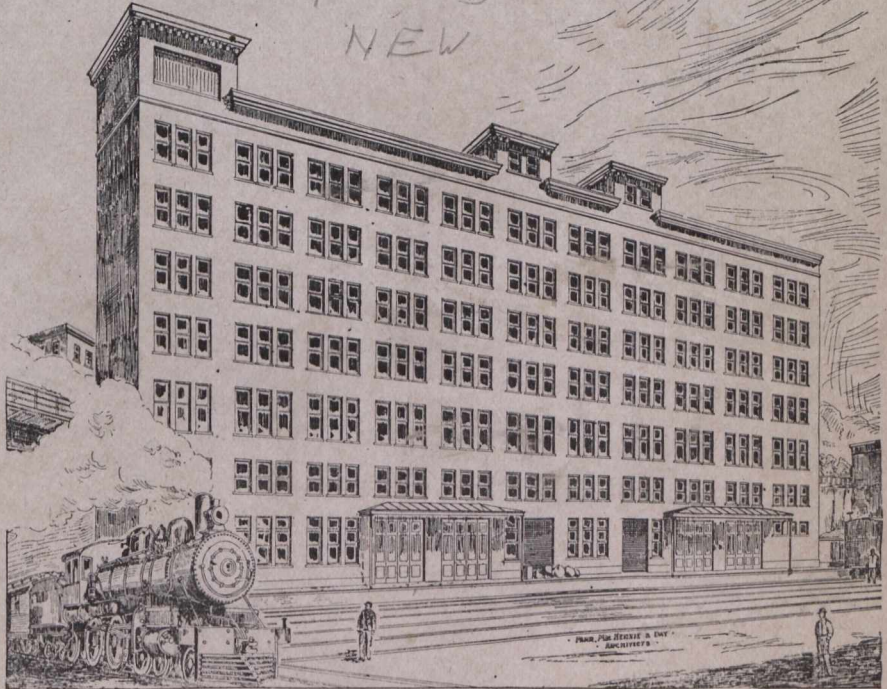
THE CANADIAN INDUSTRIAL REVIEW

A QUARTERLY REVIEW OF INDUSTRIAL PROGRESS

JANUARY 1913



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NEW WAREHOUSE AND OFFICE BUILDING FOR THE CANADIAN FAIRBANKS-MORSE COMPANY LIMITED, NOW BEING ERRECTED IN VANCOUVER

(SEE ARTICLE ON PAGE 31)

Does Your Packing
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GENERAL OFFICE
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STOCKTON CAL Sept 20/1912.

Green, Fred - tho,
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I am using Palmetto packing under the following conditions

I buy the 1" for 2" cyl after being in shore on an axle of 10" nos I tear off outer covering and use 5/8" for valve stems of 2" cyl it is in there about 12 mos then take off one covering and use at 1/2" in 2" cyl valve stems it is good for about 8 mos shore (175 lbs steam 150° superheat then use the inside for packing valve stems etc - The inside is still soft and a person would never know it had been in use 2 1/2 yrs

Respectfully Yours,
E B Myers,
Chief Engineer

It's the packing that remains soft in
service that lasts

"PALMETTO"

packing remains soft and pliable because of
the lubricant contained in each single strand

TRY A FREE WORKING SAMPLE

GREENE, TWEED & CO

SOLE MANUFACTURERS

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NEW YORK

CANADIAN
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There is More to it than "Steel is Steel" and "A Grinding Wheel is a Grinding Wheel"

To the man in the office "steel is steel." Machinery steel, tool steel, high speed steel all look alike to him. But it is not so with the shop man—the machinist, the tool maker, the man responsible for quality and production.

To such men there is a steel that is best for a certain purpose—for a vital machine part—for tools designed to take deep cuts or light cuts, or for a desired finish.

They study the working conditions, the steel and analyze the results. They experiment until they find the right steel.

The grinding wheel is a metal-cutting tool. Its purpose is to reduce metal and obtain a desired finish—its function is as important as the steel tool.

To the office man and some shop men "a grinding wheel is a grinding wheel." Selections of make are decided by the manufacturers' discounts. Could there be a worse fallacy?

Norton Grinding Wheels are the result of scientific development. The abrasives used are the most

modern. They are skillfully bonded, and graded for hardness and each wheel has a known value.

There is a Norton wheel that is best for each specific operation; for round grinding, surface grinding, tool grinding, internal grinding—for machinery, manganese or high speed steels; for cast iron, chilled iron, bronze, brass or aluminum.

And that wheel must be selected to meet all the conditions that affect the operations—such as condition of machine, speeds, contact, method of grinding, etc.

Alundum Grinding Wheels (coarse or fine, hard or soft) are most efficient under some conditions; Crystolon Wheels under other conditions.

If we don't know the right wheel for the conditions you name in detail, our research and experimental departments will help us to determine it.

There is more to it than "steel is steel" and a "grinding wheel is a grinding wheel."



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WROUGHT PIPE

LAPWELD, BUTTWELD, up to and including 10" I. D. BLACK, GALVANIZED, COATED, TARRED, MERCHANT, STEAM, GAS, WATER—Extra Strong and Double Extra Strong. HYDRAULIC Oil and Gas Line Pipe—with Special Taper Sockets. Specially adapted for High Pressure. :: :: :: ::
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WELDED BEDSTEAD TUBING
TROLLEY POLES. SIGNAL MASTS

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— HEAD OFFICE —

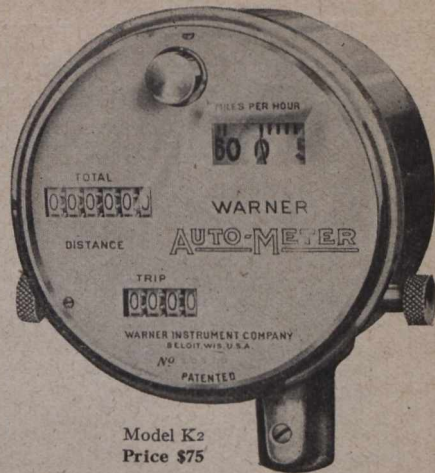
813 Traders Bank Building
TORONTO - - ONTARIO

Warner Auto-Meter

The Aristocrat Speed Indicator

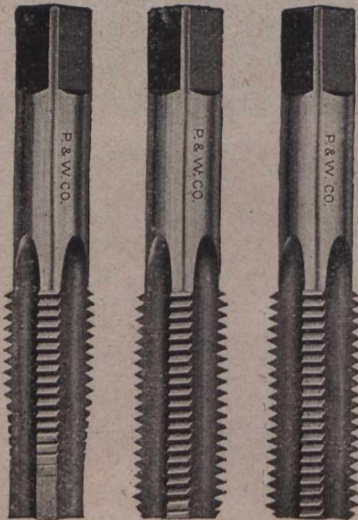
So to be sure of your speed and mileage *insist on a Warner*—the most accurate speed and mileage indicator made.

It will pay you to insist on a Warner when you buy your car. If it is a part of any car you might have in your mind, you can feel satisfied with the rest of the car.



Model K2
Price \$75

Donald F. Johnston Co. Limited 559 Yonge St.
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THE CANADIAN FAIRBANKS-MORSE CO. LIMITED, Representatives



SMALL TOOLS

YOU who are familiar with machine shop practice know that such names as PRATT & WHITNEY, BROWN & SHARPE, YALE & TOWNE, NORTON, PARKER, &c., stand for the highest quality of output.

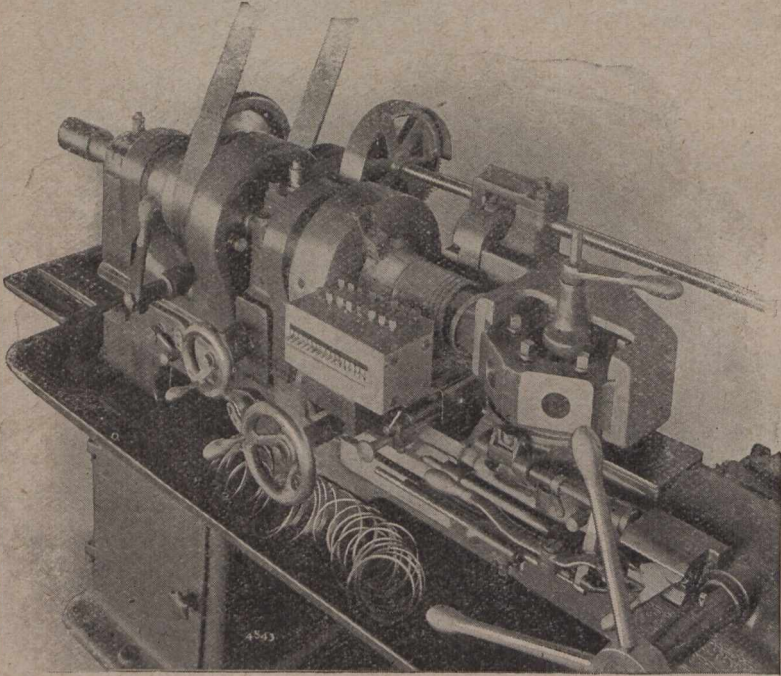
Get a copy of our Catalog No. 16 on "Small Tools and Supplies" and keep it for reference.

**The Canadian Fairbanks-Morse Co.
LIMITED**

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In answering advertisements kindly mention "The Review"

Gas Engine Piston and Piston Rings Rapidly and Accurately Machined



P. & W. STANDARD TURRET LATHE with tool equipment for finishing eccentric piston rings.

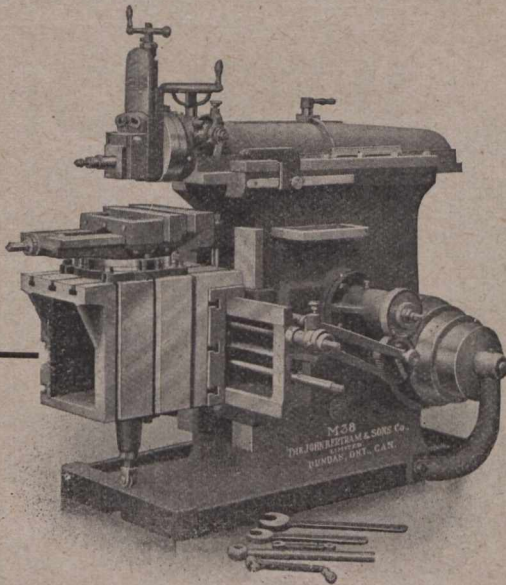
Piston rings are bored inside, eccentrically turned outside and cut off simultaneously.

Our tool equipment for finishing gas engine pistons turns, faces and grooves simultaneously. Turns out a piston of greater accuracy and at a greater saving than any other machine on the market. Automatic features enable one man to operate several machines. Inquiries covering your requirements solicited.

PRATT & WHITNEY COMPANY
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Canadian Sales Agents **The Canadian Fairbanks-Morse Co. Limited**
Montreal, Toronto, St. John, N. B., Winnipeg, Saskatoon, Calgary, Vancouver

In answering advertisements kindly mention "The Review"



The Finest Tool and Die Work

AS well as ordinary shop work can be done on this 24-inch Bertram Shaper. All adjustments are made quickly from one side of the machine, and the screw which elevates the knee is provided with ball-thrust bearings, making it easy to adjust. The table has variable power-feeds in both directions, and is of box form with three available working sides. This machine is driven from a four-step cone for wide belt supported by an outer bearing. The special construction of the base gives additional rigidity to the machine.

Full specifications on application

The John Bertram & Sons Company Limited
DUNDAS, ONT.

Canada's Largest Machine Tool Builders

SALES AGENTS The Canadian Fairbanks-Morse Co. Limited
Montreal, St. John, N.B., Toronto, Winnipeg, Vancouver, Saskatoon

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Not Even an Anxious Moment

WEED CHAINS

Give Confidence

A NARROW road, a precipitous descent, a sharp turn and a dangerous railroad crossing. Surely enough to instil fear into the mind of any automobile driver, but if your car is equipped with Weed Chains you are absolutely sure of *sufficient traction, perfect brake control* and the *elimination of every possibility of skidding.*

Are you still taking your life in your hands by refusing to take the necessary precaution to prevent skidding?

Are you still unwisely depending on rubber alone for your own safety, the safety of the occupants of your car and other road users?

Over forty miles of

WEED ANTI-SKID Chains

sold every day in the year.
No dull seasons.

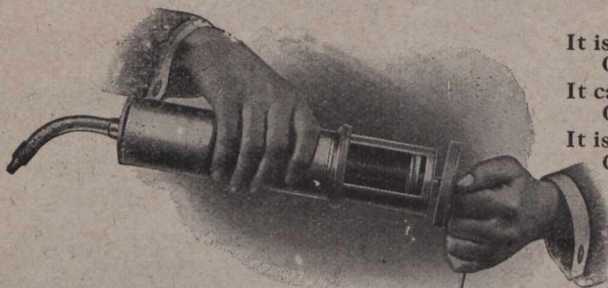
You should give Weed Chains your immediate attention.

Order a stock of them from your jobber today.

Weed Chain Tire Grip Co.
Canadian Factory, Niagara Falls, Ont.

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TOWNSEND GREASE GUN



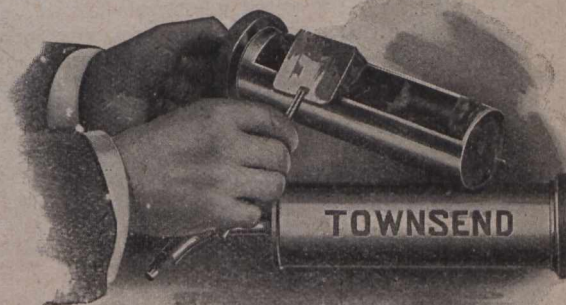
It is clean:
Others are dirty.
It can be filled:
Others cannot.
It is easy of operation:
Others are hard.
It is quick:
Others are slow.

Separate the Cylinders like this

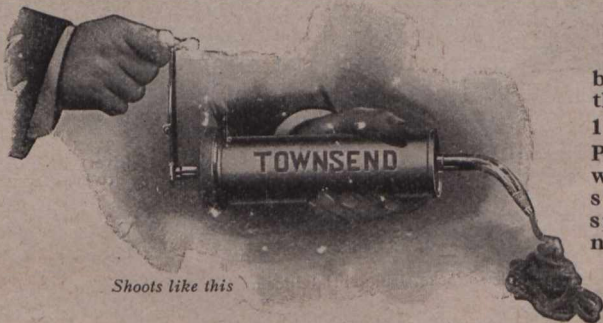
The opening in the inner cylinder enables you to easily, quickly and cleanly fill it.

It loads and shoots 1 lb. in 40 seconds.

It does it easily.



Take the 'paddle' sent with the Gun and fill like this



Shoots like this

Made of best brass tube .04 thick.

1 lb., $\frac{3}{4}$ lb., $\frac{1}{2}$ lb.

Packed in strong wooden box with steel paddle, 5" spout and solid nozzle 3-16" hole.

Warranted the best Gun on earth.

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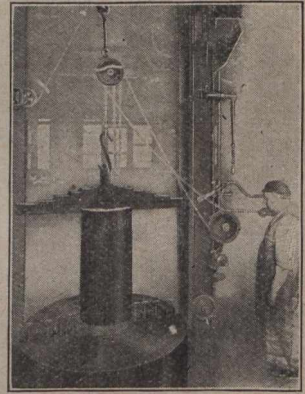
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THE TRIPLEX BLOCK

Protect Both the Worker and Yourself

AFTER the chain block accident the Employers' Liability Act comes into play. It spares neither the injury to the worker nor the costly experience to the employer.

¶ The Yale & Towne Act spares both—it prevents the accident—because that act passed years ago in our factory, demand every chain block before shipment be tested to a 50% overload.



To pass that severe test, all load-bearing parts are of steel—steel hooks, steel gears, steel load sheaves, steel chain and steel driving pinion—Triplex Blocks are absolutely safe to the user.

¶ The new book of Hoists B1 is ready. It is an illustrated engineering report of the safe handling practice. Write for it now.

TRIPLEX BLOCKS { 16 sizes: One-fourth of a ton to forty tons.
300 Active Stocks all over the United States.

Every Block Tested to 50% Overload.

The Yale & Towne Mfg. Co.

Also Duplex Blocks, Differential Blocks and Electric Hoists.

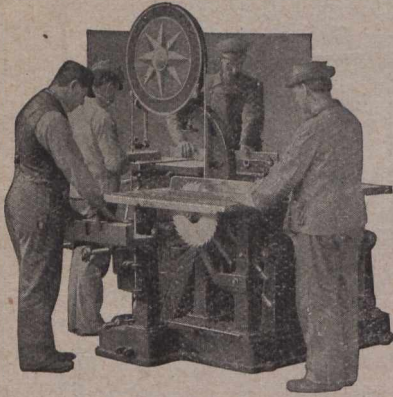
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Time—Space—Power—Labor

YOU CAN SAVE ALL OF THESE
IN YOUR WOOD WORKING

HERE'S A MACHINE by which four men handle four distinct jobs without interference—compact and self-contained, yet ready for any of the hundred odd jobs in your factory—box-making, racks for stockroom, patterns, general repairs, it handles them all.



BAND SAW BORER
JOINTER SHAPER
CIRCULAR SAW

Special Attachments:
MORTISING
TENONING
ROUNDING POLES
MOULDING
PANEL RAISING

CRESCENT UNIVERSAL
WOOD WORKER



Q Not an adaption of one machine to many uses, nor a flimsy contrivance which works with varied success—but a substantial scientifically designed tool with ample provision for every adjustment. A combination woodworker without the slightest sacrifice of serviceability.

WRITE FOR OUR ILLUSTRATED BOOKLET

Q It will show you on what we base our claims—how others have proved them—sent free.

The Crescent Machine Company

36 Columbia Street :: Leetonia, Ohio

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FOR USE ON
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MOTOR TRUCKS
MOTOR BOATS, &c.

PRICE \$3.50

Prevents water and sediment in gasoline reaching the Carburetor.
Send for descriptive and illustrated folder

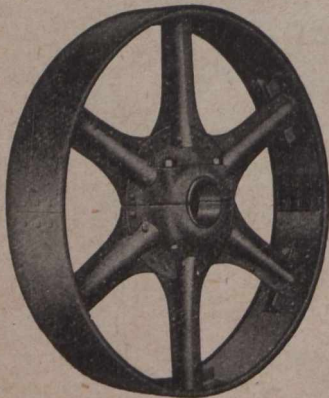
FOR SALE BY

The Canadian Fairbanks-Morse Co. Limited

MONTREAL OTTAWA TORONTO ST. JOHN WINNIPEG
 CALGARY SASKATOON VANCOUVER VICTORIA

THE ONEIDA PULLEY

REDUCES POWER BILLS AND BELT BILLS



THE light weight of "Oneida" Steel Pulleys is the means of lowering the amount of power usually lost in transmission, being from 1-4 to 1-3 the weight of cast iron. The perfect crown presents a smooth convex surface, every square inch of which is gripped by the belt. This gives from 15% to 30% better belt adhesion than cast iron and reduces the slippage and wear on belts.

Our Catalogue is FREE—Write for it.

Oneida Steel Pulley Co., Oneida, N.Y.

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RUBBER GOODS

Belting: For Power Transmission, Conveying and Elevating. Tell us the conditions and we can supply a Belt to do the work.

Hose: Every kind for use anywhere.

Packing and Valves: For high and low pressures.

Rubber Coats: HEAVY—for Drivers, Miners, Firemen, etc.

LIGHT—in many styles and shades for men and women.

Rubber Footwear: An immense range for every purpose.

Felt Footwear: Quality supreme.

Rubber Inlaid Tiling: In many designs.

Rubber Mats and Matting: For every purpose.

Rubber Specialties: We make and supply an immense range of special rubber articles.

When in need of rubber goods of any kind, call or write to our nearest sales branch.—Our travelling salesmen cover Canada from Coast to Coast

Canadian Consolidated Rubber Company

	Order from the nearest Branch	LIMITED
HALIFAX	SYDNEY	YARMOUTH
MONCTON	ST. JOHN	QUEBEC
MONTRÉAL	OTTAWA	KINGSTON
HAMILTON	PORT DALHOUSIE	BRANTFORD
LONDON	WINNIPEG	REGINA
CALGARY	EDMONTON	VANCOUVER
		CHARLOTTETOWN
		GRANBY
		TORONTO
		BERLIN
		SASKATOON
		VICTORIA

R. J. YOUNGE, General Sales Manager
J. M. S. CARROLL, District Manager, Montreal

You Pay Only Once For This Stool

HOW often do you have to buy stools for your factory? Let us show you one that never wears out.

Q This stool is made of angle steel, the strongest material for the purpose, and the seats are nicely finished in polished hardwood.

Q One of our many customers writes: "The two stools you supplied us with last July have given excellent satisfaction and we will replace all our wooden stools with your goods as our requirements demand. In the meantime enter our order for two dozen 18 inch."

Write to us for catalog containing details, illustrations and prices.



Canada Wire & Iron Goods Co.

HAMILTON, ONTARIO

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Automobile
Supplies

THE
CANADIAN FAIRBANKS-MORSE CO.
LIMITED

SEND FOR THIS CATALOG

YOU should have it beside you for ready reference. All of our Branch Houses carry a complete and up-to-date stock of automobile supplies, and it will certainly be greatly to your advantage to know just where you can obtain such goods of standard quality. Whether you are dealer or consumer, you need this new catalog.

Write for your copy today

The Canadian Fairbanks-Morse Co. Limited
444 St. James St., Montreal

The Canadian Industrial Review

• A QUARTERLY REVIEW OF INDUSTRIAL PROGRESS •

VOL. VIII MONTREAL, JANUARY, 1913 No. 1

20 cents a Year Lewis C. Randolph, Editor 5 cents a Copy

MONTREAL, 444 ST. JAMES STREET
ST. JOHN, N.B., 71 PRINCE WILLIAM STREET
OTTAWA, 41 BANK STREET
TORONTO, 26-28 FRONT STREET WEST

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VANCOUVER, 101 WATER STREET

15,000 COPIES OF THIS ISSUE HAVE BEEN PRINTED

ANNOUNCEMENT

With this issue the CANADIAN INDUSTRIAL REVIEW changes from a monthly to a quarterly publication. The first number of the quarterly was due to come out in January, but has been considerably delayed on account of the readjustments in advertising rates that were necessary as a consequence of a large increase in circulation. Our plan is to bring out a number about the middle of each season, for instance, during the months of January, April, July and October.

We hope to make the little magazine more interesting and instructive than it has been in the past. Our readers can help us do this by suggesting ways of improving it and also by sending in short items of interest relating to the industrial growth of Canada. We shall be pleased to publish these articles over your signature.

• • •

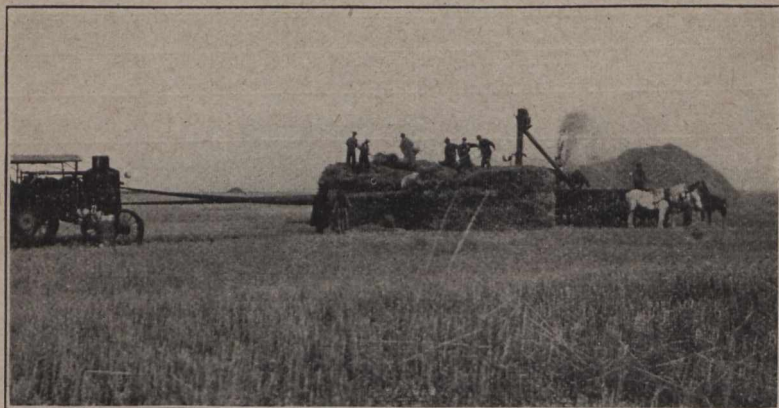
A Fairbanks-Morse Tractor in the heart of the Doukhobor Country.

The photographs illustrating this article were taken on the farm of Mr. J. O. Portsmouth, near Blaine Lake, Sask.

Mr. Portsmouth first purchased a 15-30 Fairbanks-Morse tractor, but finding it somewhat too small he bought a larger engine.

This engine is operating a 36-inch separator, but it has sufficient power, Mr. Portsmouth says, to operate a much larger threshing machine.

This farm is located in the heart of the Doukhobor country, and the laborers shown here in these photographs are "Douks," but not of the poor illiterate class who have caused the Canadian Government so much trouble in the past.



A Fairbanks-Morse Tractor Threshing Wheat in the Doukhobor Country

The Doukhobors are good customers, being strictly honest and very hard workers, and as they get used to our language and customs they become good citizens. It is a fact that they can grow better wheat than their English-speaking neighbors, as they are more particular in tilling the soil and are very thorough in their work.

In this connection it will be interesting to reproduce an article on the Doukhobors from the September issue of Chambers's Journal. It is as follows:—

In 1908 a good deal of surprise was occasioned in Nelson, the principal town of the Kootenay district, in the south-east corner of British Columbia, by the news that the Doukhobors had bought a tract of two thousand nine hundred acres of fruitland beside the Columbia River, some twenty miles west of Nelson, and three thousand five hundred acres at Grand Forks, seventy-five miles farther to the south-west, and intended to plant them with orchards. People began to ask one another, 'Who are the Doukhobors?' 'Where do they come from?' 'What are they going to do with all that land?' And in allusion to certain somewhat disagreeable rumors which had attended their coming, the further questions were occasionally heard, 'Is it true that they go about without any clothes?' 'Don't they ever marry?' 'Are they dangerous religious fanatics?' 'What do they believe, anyway?'

In a little while certain items of reliable information became known about the new-comers. Originally the Doukhobors were a religious sect which sprang up one hundred and seventy years ago in the government of Kharkov, one of the provinces of the southern part of Middle Russia. Their religious tenets are in several

respects akin to those of the Quakers. They object to bear arms for any cause whatsoever. The present leader of the community in British Columbia, Peter Veregin, was exiled to Siberia for fifteen years for refusing to join the colors when called upon in the usual way; and his brother, who is also in British Columbia, was sentenced to eleven years exile in the same part of the world for the same cause. At one time this tenet seemed likely to lead to trouble when the recent Canadian census was taken. The people who are settled at Brilliant, the Doukhobor colony beside the Columbia River, refused to give the authorities any information whatever. Their leader, Peter Veregin, ably backed by his lieutenant, John Sherbibin, tried his utmost to persuade them to comply with the demands of the census officials. Nevertheless they quietly but firmly resisted his authority; and yet the deference they habitually pay to him is very great, and every man who meets him invariably raises his hat in greeting. The ground of the revolt was the fear and suspicion that the Canadian Government wanted to enrol them for military service.

Another of their distinguishing traits is that they refuse to eat the flesh of any animal which has been killed for that object, and to wear its skin or hair or wool. To the outside world their most noticeable peculiarity is that they own all property in common; there is no private property. Their houses even stand two together, one being occupied by the women and the other by the men. The women work one week in the fields, woods, and factories, and in the second week do domestic work in the houses. They are simply but neatly dressed, the women wearing shawls over their heads instead of hats, and aprons over their gowns, and the men being dressed in jerseys and woollen head-dresses. They are clean in their persons, and wear an air of contentment and prosperity. Their food consists, of course, of fruit and vegetables with milk and bread.

After suffering persecution on various occasions from the Russian Government, and being moved from one part of the empire to the other, a large body of them, numbering several thousands, settled in the district of Yorkton, in the Canadian province of Saskatchewan, in the year 1889. In making this move they were assisted by English and American Quakers and by Count Leo Tolstoi, the well-known Russian writer, who was a very close personal friend of Peter Veregin, the Doukhobor leader. Indeed, people who knew the latter state that he is himself a very remarkable man, long-sighted, a deep thinker, and a man of lofty ideals.

In 1902 and the following years part of their body occasioned the Dominion authorities a certain degree of anxiety. They became possessed with the idea that the second Advent of Christ

No User of Ball Bearings can Afford to Neglect these Points

1. **Double Row of Balls**—virtually two bearings in one a splendid feature under any load condition.
2. **Pressed Retainer in One Piece**—made from Swedish Lancashire Iron. No rivets, wires or screws to work loose, jam balls, disarrange spacing or make noise.
3. **Outer Race Spherical**—providing for a frictionless self-alignment that absolutely and automatically compensates for shaft spring.
4. **Best Swedish Crucible Steel**—Carefully heat-treated and uniform in hardness throughout. Unequaled for toughness, carrying capacity, accuracy and durability.

SKEFKO

is the only truly self-aligning bearing. This feature alone is worth most careful consideration.

QSKEFKO Self-Aligning Double Row, Double-Capacity, Double-Life Ball Bearings cost no more and are made in international standard sizes. Their use is practical under any speed and load condition and the lubrication and protective housing can be made to conform to any service requirements.

QSKEFKO are the recognized standard and are replacing other constructions in many types of machinery.

Our literature explains these matters in detail. Your best interests demand that you investigate. Tell us your bearing troubles and ask for our bulletins.

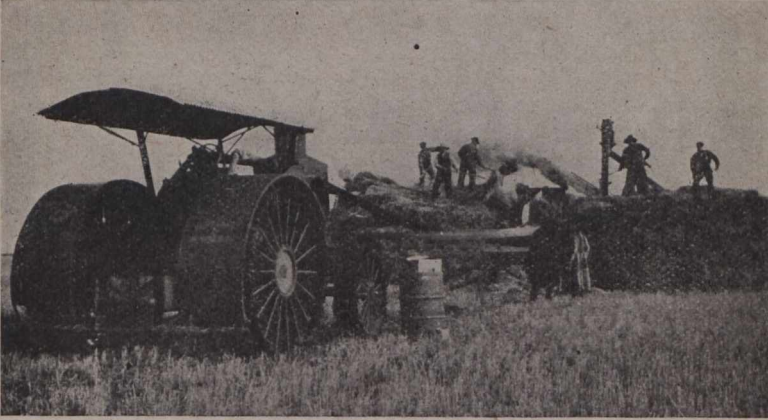
SALES AGENTS

The Canadian Fairbanks-Morse Co. Limited

MONTREAL ST. JOHN QUEBEC, OTTAWA TORONTO
WINNIPEG CALGARY SASKATOON VANCOUVER

In answering advertisements kindly mention "The Review"

was imminent, and they insisted upon setting out to meet Him, taking with them no food and rejecting their own clothing wholly or in part, in order that they might appear before the Lord divested of all adventitious aids to any claim upon his consideration. It was with considerable difficulty that they were induced to turn back to their homes, after being escorted for some distance by the Royal North West Mounted Police.

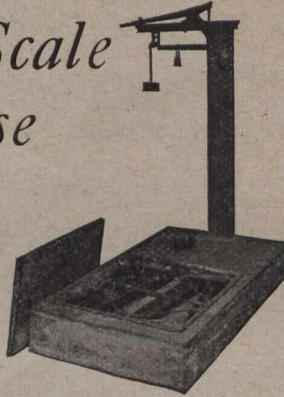


Another View of the Doukhobors Using a Fairbanks-Morse Tractor

In 1890, as stated above, their leaders bought six thousand four hundred acres of land in the Kootenay district of British Columbia; and these first purchases were quickly followed by others—namely, one thousand one hundred acres at Slocan Junction, about fifteen miles west of Nelson; two thousand five hundred acres at Pass Creek, a few miles farther west; fifty acres on the opposite side of the river from their settlement at Brilliant, part of this being an orchard in bearing; and finally in September 1911, they bought the Crescent Valley Ranch, only three to four miles from Slocan Junction, comprising one thousand two hundred acres, a ranch which had been cultivated for some eight years by a prominent citizen of Nelson. In this way the Doukhobors now own approximately eleven thousand acres in British Columbia. The settlement at Brilliant numbers about one thousand five hundred people, and that at Grand Forks nearly five hundred. In addition, there are still four thousand left at Yorktown, in Saskatchewan.

In Saskatchewan they have seven flour-mills and six elevators or big wheat warehouses. They engage principally in agriculture, and are said to be good farmers. One who lived five weeks amongst them quite recently says: 'I watched during my visit to see if I

Think of a Scale Being in Use 73 Years!



THE owner of this scale wrote us recently that it needed some repairs. In this letter he said, "My store was built in 1840 and I think this scale was put in at that time and has always been ready for use."

□ Its shop number is 30, indicating that it was built about 1832, or shortly after we started to manufacture scales.

FAIRBANKS

"The Scales That Made Weighing Accurate"

□ There is no use buying a scale at all if it will not weigh correctly, just as there is no use buying a watch that will not tell you the correct time. Accuracy is the first essential in scales.

□ Fairbanks Scales made weighing accurate. For over 80 years they have been the world's recognized standard.

□ Accuracy and long service are what you obtain when you buy a Fairbanks Scale.

The Canadian Fairbanks-Morse Co. Limited

Montreal Toronto St. John Ottawa Saskatoon
Calgary Winnipeg Vancouver Victoria

In answering advertisements kindly mention "The Review"

could find a frown or a discontented face, and I was unable to discover one. In cleanliness they are superb. There is no liquor drunk among the Doukhobors, no tobacco used in any form, no profane language, while an exhibition of bad temper is impossible to find. And the morality of these good people is a world-beater. . . . The Doukhobors are an extremely honest people, good neighbours, and most law-abiding citizens. The progress they have made in Saskatchewan is marvellous.'

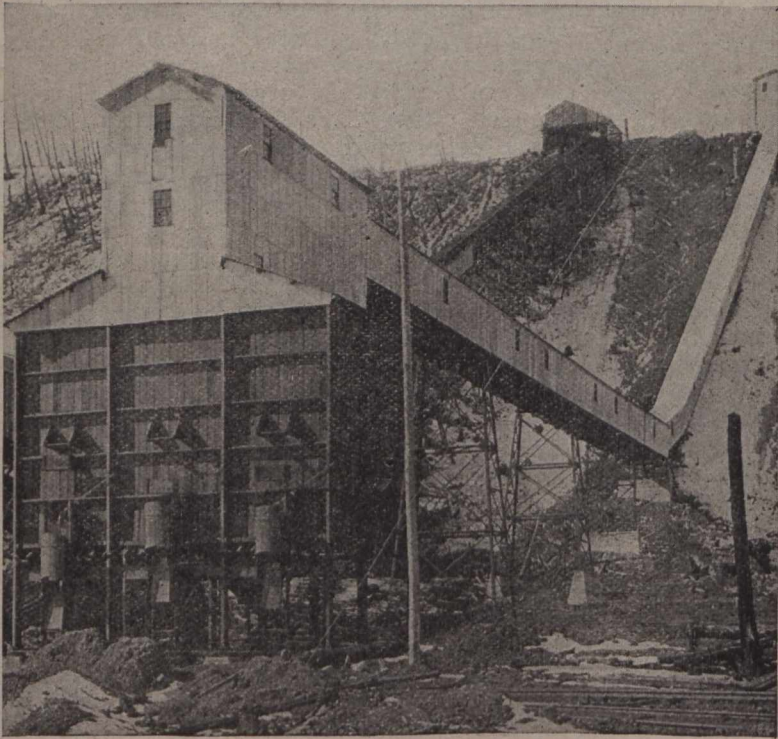
In British Columbia it has been equally marvellous; although it is only three years since they began operations, they have already cleared at Brilliant alone a total of one thousand acres of land, all of which is planted with fruit trees, these numbering sixty thousand in all. But they include within the range of their energies many other trades and crafts, represented in the following: house-building, saw-milling, planing-mills, bee-keeping, sash and door factories, brick-making, flour-mills, linseed oil mills, a jam factory, and in Saskatchewan twenty threshing machines with full complements of engines and men. At Brilliant they have also constructed a hospital; a huge concrete tank or reservoir one hundred and fifty feet long, seventy feet wide, and thirteen feet deep; and their own telephone system. At Brilliant they possess fifty horses, and in Saskatchewan no less than seven hundred teams and six hundred span of oxen. In the spring of 1911 they started a jam factory in Nelson, and agreed not only to pay the market price for the fruit, but also to send their own pickers to gather it. This should prove of immense advantage to all the fruit ranchers who are dependent upon small fruits for a living during the time that their orchards are growing up and before they come into bearing. The high cost of labor is a real handicap to the grower of small fruits. Not only is it dear, but it is also difficult to obtain. Hence the advent of this body of trained workers in the heart of the fruit-growing district of West Kootenay is likely to prove of great service to the community in general.

During the hot summer of 1910 the Doukhobors proved of very great assistance to the local government fire wardens of the province in fighting the many bush or forest fires which broke out. They were able to send out quite a small army of men at the shortest notice, and in fact did so on more than one occasion. They are strong, sturdy men, and accustomed to hard, muscular work from their youth up.

They live in frame or wooden houses, large two storied, cottage roofed buildings, with fine high ceilings and plenty of windows.' They are built from lumber sawn in their own mill, and veneered with bricks made in their own brick-kilns.

At first there was a certain amount of prejudice against these people, partly because of what was supposed to be their religious

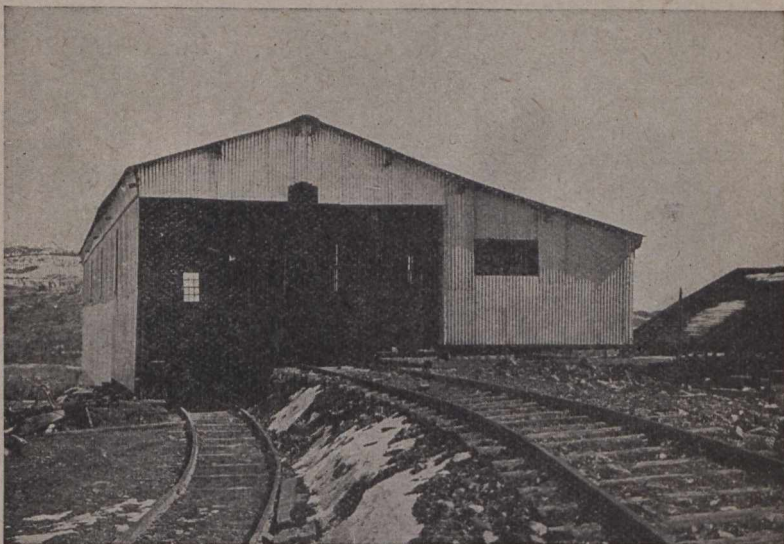
fanaticism and partly because of their refusal to fuse with the rest of the population. It was felt that they were creating a self-contained community which held itself aloof from the rest of the people amongst whom they had come to live. An endeavor was made to break down this spirit of exclusiveness by getting up an agitation which should call upon the provincial government to enforce the attendance of the Doukhobor children at schools similar to those which exist in every other part of the province. To this the Doukhobors have expressed their willingness to conform, and have often invited the Board of Education to furnish them with proper teachers for the schools which they are building for themselves. Time shows that if there does not exist any religious fanaticism amongst them, they are at pains to keep it to themselves, and none of it is evident to their neighbors about them.



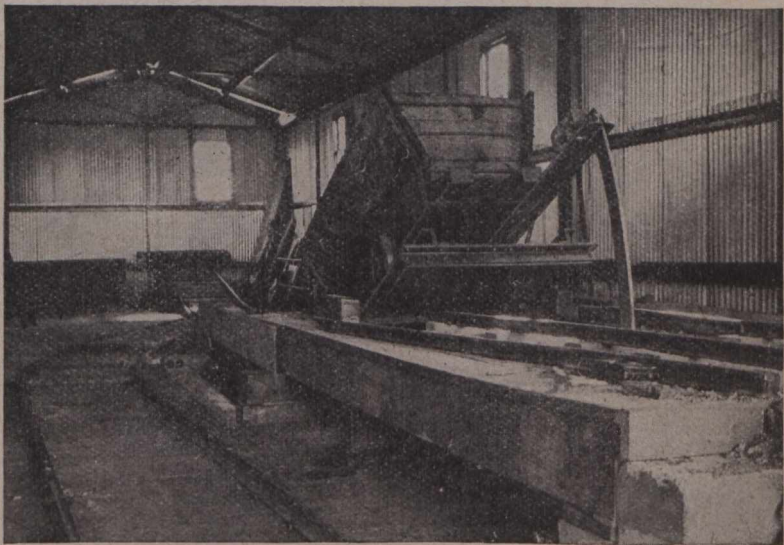
1. New Bin House and Conveyor

A Very Long Retarding Coal Conveyor.

When a coal seam lies at a considerable elevation above the level of the railroad tracks, special provisions must be made

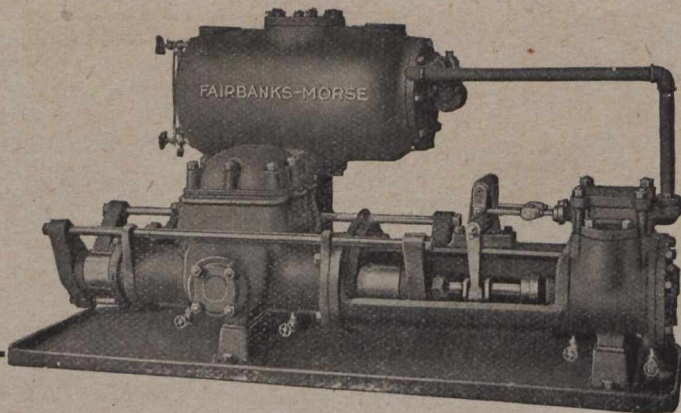


2. Dump House to which Mine Cars are Brought by Electric Locomotives



3. Dumping the Coal into Hopper at Head of Conveyor

for lowering the coal to the cars in which it is to go to market. The lowering must be done reliably, to avoid delays; it must be



**This Feed Pump and
Receiver Is More Reliable
Than a Steam Trap**

IT can handle sudden rushes of water better. By the use of this Pump the annoyances experienced with steam traps, tanks and similar devices are entirely eliminated.

Q This is a simple and effective combination of our duplex steam pump attached to receiving tank, which receives the water of condensation and the pump automatically returns it to the boiler at the highest possible temperature.

Q It is especially useful for returning water of condensation from steam heating coils, drying cylinders, evaporating effects or in any place where it is desirable to return such condensation to the boiler at as high a temperature as possible.

Q The tanks used with our pumps and receivers are made strong enough to stand a pressure of 100 lbs. per square inch.

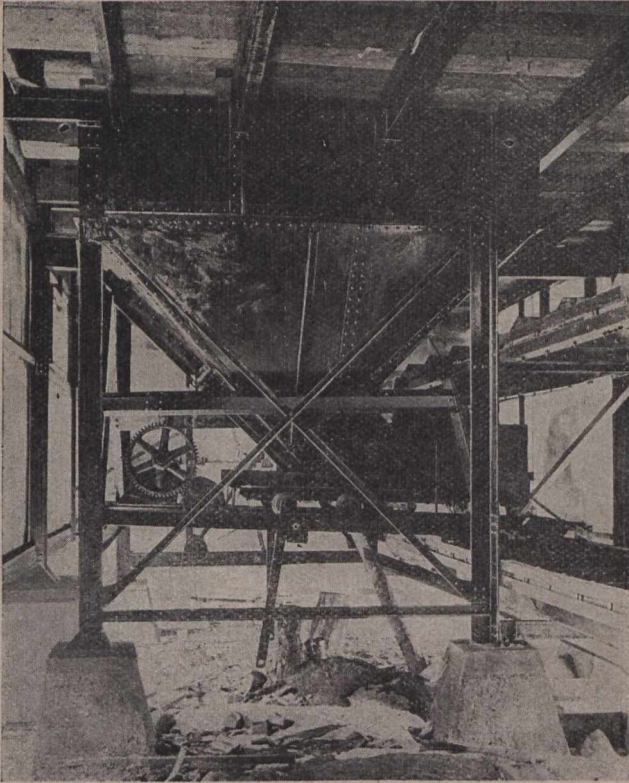
Q The capacity of the Fairbanks-Morse Duplex Ram Pattern Pump and Receiver shown above is 50 gallons per minute. Full details furnished upon request.

Ask for Catalog No. 13

The Canadian Fairbanks-Morse Co. Limited

MONTREAL TORONTO OTTAWA ST. JOHN CALGARY
SASKATOON WINNIPEG VANCOUVER VICTORIA

In answering advertisements kindly mention "The Review"



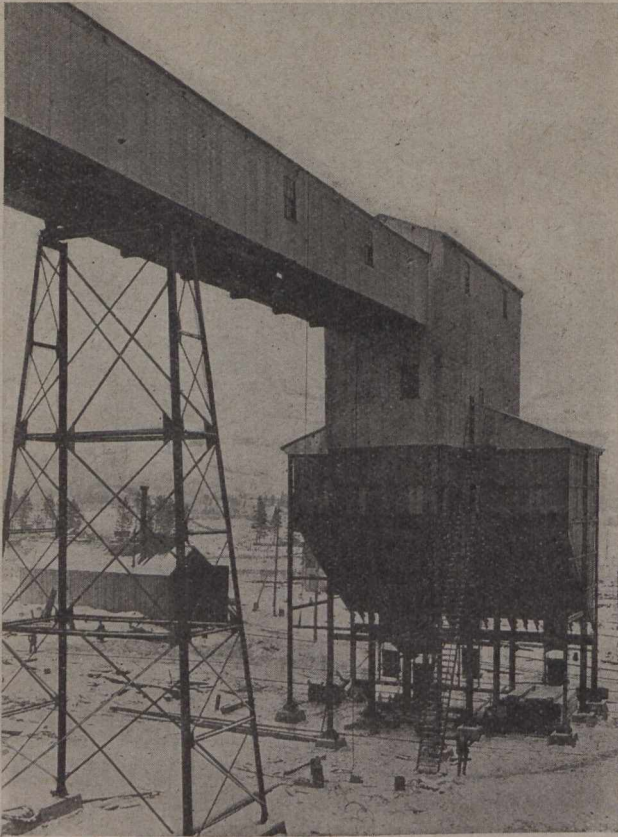
4. Hopper Beneath Tipple and Feeder to Conveyor

done carefully to cause least possible breakage of the coal; it must be done rapidly, to insure against limitation of output.

Sometimes it is quite a problem. For great heights and steep hillsides the monitor method is the only practicable way. For small heights and moderate slopes, the mine cars themselves may be let down the hill. But there are intermediate situations wherein neither of these plans can be applied and where a conveyor system is best for getting the coal down from a dump at the mine level to a bin house or loading devices at the railroad below.

AN INTERESTING INSTALLATION.

We illustrate at this time an exceptional and correspondingly interesting installation of equipment for handling coal by this method. It was put in about a year ago by the Webster Manufacturing Company for the Hillcrest Collieries, at Hillcrest, Alberta, Canada, a few miles east of Crow's Nest Pass on the Canadian Pacific Railway.

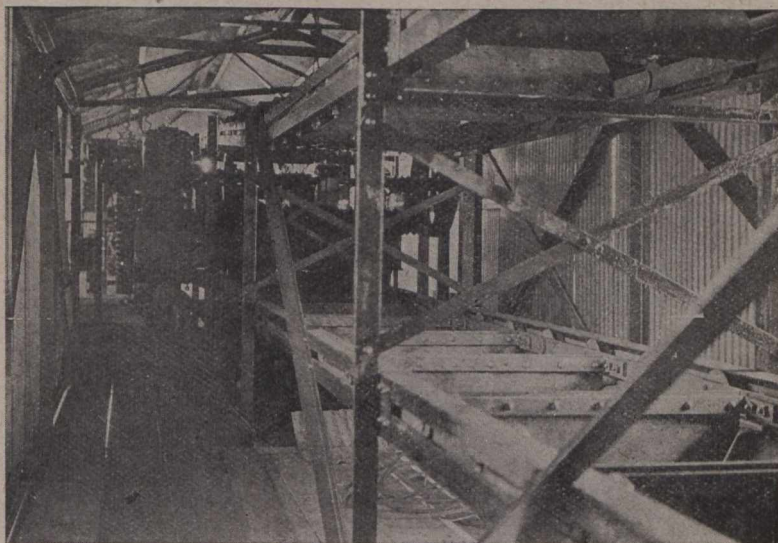


5. Conveyor Gallery and Bin House from the Rear

Here the difference in elevation is about 300 ft., and the coal is lowered from the dump, down the hillside and out horizontally to the bin house at the railroad tracks by a retarding flight conveyor of special arrangement and construction. This conveyor is one of the longest—if not the longest—of its kind ever built, and much longer than many others which have proved unsuccessful because of failure of the designers to recognize and meet properly the conditions.

The new Hillcrest conveyor is 630 ft. long—400 ft. on a 32-degree slope, Fig. 1, and 230 ft. on the horizontal reach.

Coal in mine cars is brought by electric locomotives, a distance of about one and a half miles, from the main entry of the mine to the



6. Horizontal Run of the Conveyor—Operating Mechanism at End

dump house, Fig. 2. There, after passing the scales for weighing, the cars go to the Phillips cross-over dump, Fig. 3, beneath which is a steel receiving hopper, Fig. 4. Depositing their loads into this hopper, the mine cars pass on over the dump and switch back on the lower track for empties, Figs. 2 and 3, for making up into "trips" to be hauled back to the mine.

The dump house is built out over the crest of the hill, so there is room beneath the floor for the receiving hopper and the upper end of the long conveyor, Fig. 4. Coal is delivered from the hopper to the lower run of the conveyor by a reciprocating feeder, driven from the head shaft of the conveyor. This feeder gives the uniform loading so essential to greatest efficiency in conveyor work.

The coal is carried on the lower run of the conveyor, as shown by the position of the feeder, Fig. 4. For a few feet at its upper end the conveyor is horizontal, beneath the dump house, before turning downward for the 400-ft. slope down the hillside. Thence the horizontal run out to the top of the bin house, Figs. 1 and 3, is carried on suitable steel towers. The last 100 ft., of the horizontal run, Fig. 6, is used as a picking table, for removal of impurities.

SPECIAL DRIVE AND TAKE-UP.

This being a retarding conveyor, on its inclined portion, the great weight of the load, and of the chain and flights, made impracticable the placing of take-up devices at the loading end, as

THE MILBURN LIGHT

5,000 Candle Power Lights 1,000 Feet

THIS light can be regulated from a needle point to 5,000 candle power. It is fitted with a 12-inch non-tarnishing, parabolic reflector and an absolutely storm-proof burner.

It is also supplied with an extra cylinder, giving a total burning capacity of 12 hours and enabling the light to be recharged instantly.

Acknowledged to be the most perfect portable light ever devised. Uses carbide and water, and burns over half air. Is smokeless, incandescent and absolutely storm-proof. Lights instantly and requires no attention during use. Meets the most exacting demands of contractors, railways, tunnels, mines, steam shovels, dredges, etc.

OVER 70,000 IN USE.

Ask for 48-page Catalog.

The Canadian Fairbanks-Morse Co. Limited

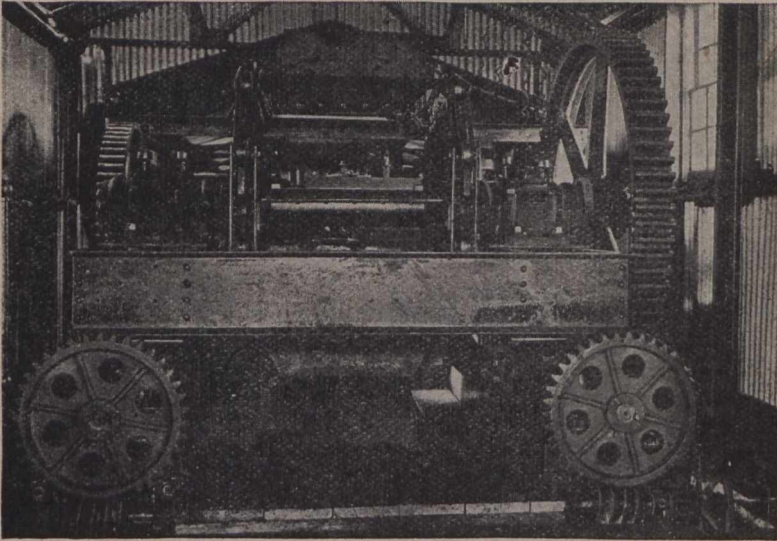
MONTREAL, ST. JOHN, OTTAWA, TORONTO, WINNIPEG
CALGARY, SASKATOON, VANCOUVER, VICTORIA



No. 2

Size 10 x 30 in. Height 5 ft.
Weight Empty 50 lbs.
Weight Packed 75 lbs.
Each Cylinder Charge 9 lbs.
Costs 3 to 5¢ per hour.

In answering advertisements kindly mention "The Review"



7.7 Movable Carriage, Combining Take-Up and Drive Features

is usual in conveyor practice. Located at the delivery end, the take-up devices could readily be combined with the driving mechanism, so the design of this combination took the form of a moveable carriage, Figs. 6 and 7, carrying the motor, countershaft and gears for the conveyor drive, and the gears for take up purposes. The take-ups are large threaded rods, carrying worm wheels at their ends, Fig. 7, and operated by a handwheel on the end of the common worm shaft. Thus the carriage is moved easily for adjustment of the conveyor, and the driving mechanism travels with the head sprockets, making of the whole apparatus a self-contained combination of obvious effectiveness.

The conveyor is made up of $\frac{1}{2}$ x3x18-in. steel bar link chain, using $1\frac{1}{4}$ in. pins and double case-hardened steel bushings $\frac{1}{4}$ in. thick, taking all the wear between the two case-hardened surfaces. The self-oiling rollers are 5 in. in diameter, with large internal oil reservoirs. There are expansion joints in the trough and tracks every 120 ft., so arranged as to insure perfect smoothness of operation when the rollers are passing over the joints. The sprocket wheels are all cast steel, with removable and adjustable teeth.

To the left in Fig. 1 and behind the new equipment may be seen the old conveyor, which was installed only a few years ago and is now superseded by the new Webster outfit.

The new equipment complete was designed by the Webster Manufacturing Company. The conveyor was guaranteed to handle 250 tons per hour, and on original test proved itself capable

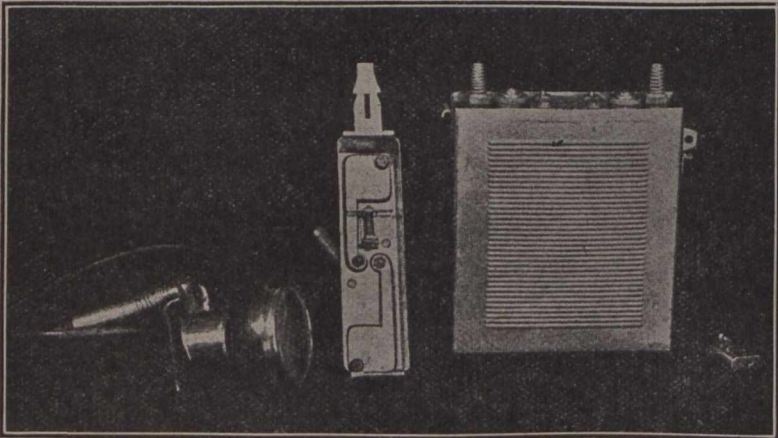
of handling 300 tons per hour under most unfavorable conditions—stopping and starting when fully loaded and also when loaded only on the horizontal run.

The Webster Company was the highest of five bidders for this contract, and the award was made not on price but on evident superiority of design and the well known quality of Webster machinery.

• • •

The Edison Electric Safety Lamp.

On the evening of January 23rd, at the American Museum of Safety, New York, the Rathenau Medal granted by the *Allgemeine Electricitaets Gesellschaft*, Berlin, for the best device or process in the electrical industry for safeguarding industrial life and health will be awarded to Thomas A. Edison, for his safety miner's lamp. The desirability of using electric lamps in place of oil lamps, even those protected with a "Davy" wire screen, is strongly felt in these days. What is needed in mines is a positive light which does not depend upon the uncertain quantity of oxygen contained in the surrounding atmosphere, but is absolutely self-contained. Further, even a Davy lamp is not perfectly safe if through careless handling it is broken.



▼ The safety lamp and battery with battery lock bar removed

Mr. Edison's miner's lamp is operated from a storage battery of large capacity and very light weight, which may be readily carried upon the back of the miner in the manner indicated in the accompanying engraving. The nickel oxide battery is particularly adapted for such work where it is liable to be roughly handled, and

subjected to such treatment as would put the ordinary lead storage battery out of commission in a short time. The battery is completely sealed and locked so that the miner cannot tamper with it, and it has only one miniature outlet for the escape of harmless gases when it is being charged. There is no danger of escape of the electrolyte even if the cell is inverted, because the outlet for the gas is at one end of the steel tube which extends downwards from the top of the container to within a half inch of the top of the electrolyte, and is so formed as to preclude the escape of the solution even when the cell is violently shaken. The gases that pass off do not carry with them any substance to corrode the steel parts used in the construction of the lamp or the case of the battery or the clothing of the miner. No injury is done if the cell is over charged and no harm comes to the plate if left semi-charged or discharged for an indefinite period. The cell may even be charged backwards without serious consequences, although of course the battery will give no service unless charged in the proper direction. The only attention required aside from charging the battery is to replenish it with distilled water from time to time and renew the electrolyte after about nine or ten months of continuous daily service.

The flexible cord connector between the battery and the lamp is provided with a terminal which when shoved into the socket of the battery case becomes locked therein and cannot be removed until the padlock on the side of the case has been removed and the lock-bar withdrawn. And so it is impossible for the miner to



How the electric safety lamp is worn
by a miner

Triple Expansion Pumping Engine

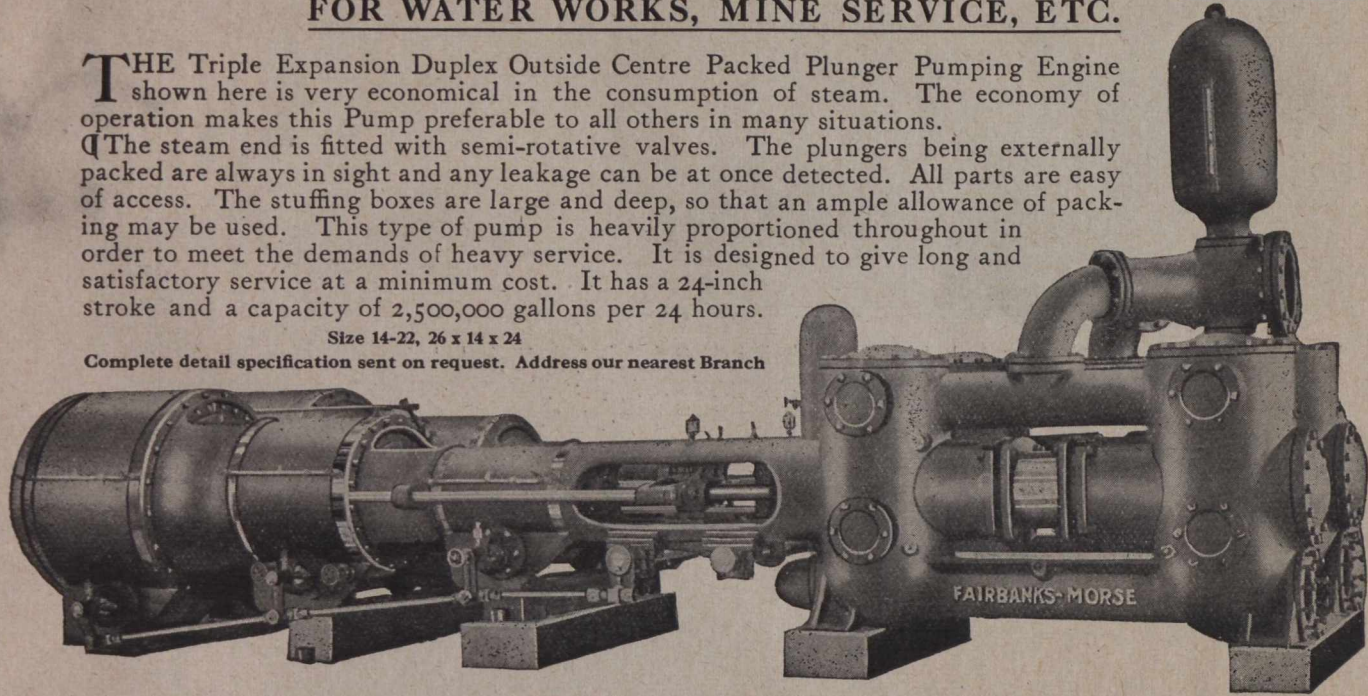
FOR WATER WORKS, MINE SERVICE, ETC.

THE Triple Expansion Duplex Outside Centre Packed Plunger Pumping Engine shown here is very economical in the consumption of steam. The economy of operation makes this Pump preferable to all others in many situations.

☐The steam end is fitted with semi-rotative valves. The plungers being externally packed are always in sight and any leakage can be at once detected. All parts are easy of access. The stuffing boxes are large and deep, so that an ample allowance of packing may be used. This type of pump is heavily proportioned throughout in order to meet the demands of heavy service. It is designed to give long and satisfactory service at a minimum cost. It has a 24-inch stroke and a capacity of 2,500,000 gallons per 24 hours.

Size 14-22, 26 x 14 x 24

Complete detail specification sent on request. Address our nearest Branch



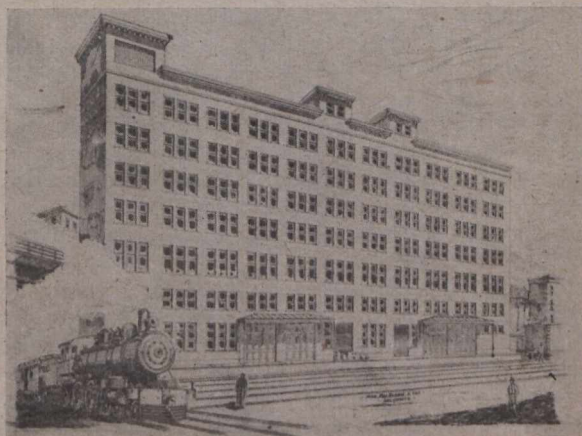
cause a spark by disconnecting his wires in the mine. To protect the conductor it is encased in flexible steel armor so as to prevent a sharp bend. A tungsten lamp is used with a parabolic reflector and a heavy lens to distribute the light over the proper area, and the lamp is provided with a hook that may be fitted to the regulation miner's cap. This lamp is the result of several years persistent work on the part of Thomas A. Edison.

• • •

New Warehouse and Office Building for the Canadian Fairbanks-Morse Co., Limited, at Vancouver.

The accompanying cut shows the new, slow-burning mill construction warehouse and office building that is being erected on the corner of Robson and Beatty Streets, at the west end of the Connaught Bridge, Vancouver, for the Canadian Fairbanks-Morse Co., Limited.

The Beatty Street frontage is 268 feet; track frontage 234 feet; depth of building 120 feet, giving an area of 20,300 square feet of floor space on each floor.



The exterior finish of the building will be pressed brick, with stone trimmings.

Extending the entire length of the Beatty and Robson Streets frontage will be large plate glass windows arranged for displaying machinery and mechanical goods.

There will be entrances on both the Robson and Beatty St. sides.

The trackage facilities will extend the entire length of the back of the buildings, giving accommodation for unloading and loading six cars.

Between the building and the track there will be a 22 ft. unloading platform extending the entire length of the building, this platform being on the same level as the basement floor and the car floor.

Facilities for receiving and despatching goods through the warehouse will be located at the north end, and the shipping at the south end.

Every modern convenience will be installed, facilitating the handling of heavy machinery and mechanical goods, there being an electric travelling crane, with a lifting capacity of four tons, extending out through the receiving and shipping entrances of the building to the tracks, so that goods may be picked up at the car door, carried into the warehouse and deposited at any point on the basement floor, or on the main elevator.

To provide for this traveling crane system, an extra high ceiling giving 16 ft. clear between the floors, has been arranged for in the basement.

The elevator at the receiving end of the building will have a platform 8 ft. x 20 ft. with a lifting capacity of seven tons, and the electric travelling crane will be arranged to serve this elevator, thereby eliminating handling heavy machinery and goods by hand.

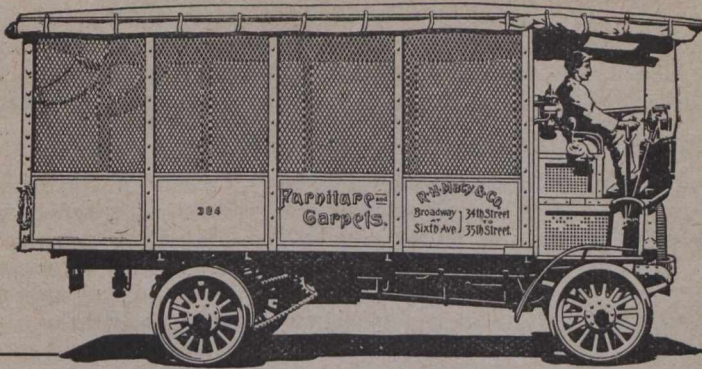
The shipping end of the building will be equipped with an elevator having a platform 8 ft. x 8 ft. and a carrying capacity of three tons.

A well equipped machine shop will occupy a space on the basement floor 80 ft. long and 45 ft. wide, and the equipment in this shop will consist of modern machine tools, 3 motor driven pipe cutting and threading machines, and test stand for testing gas and oil engines, the test stand being sufficiently large to accommodate five engines at one time.

The steam heating plant will also be located in the basement, and this will be fitted for burning oil. In addition to the regular heating plant there will be a garbage burner and heater for supplying hot water throughout the building.

The machinery display and city sales department will be located on the ground floor, and the same convenience will be installed for handling the heavy machinery on this floor as in the basement, viz., an electric travelling crane serving all sections of the display floors. Particular attention has been given to the general appearance of this display floor. Instead of the usual rough finish generally seen in warehouses, the ceiling and walls will be plastered, the columns cased and panelled with B.C. fir veneer to a height of 6 ft.

The offices are to be located on the floor above the ground floor, occupying a space running along the entire front of the Beatty and Robson Street sides, giving an office floor space 30 ft. wide x 300 ft. in length.



LONG LIFE

THIS is the most important question about your motor truck—will it last long enough to pay for the original investment with a good big profit?

MACK

"LEADING GAS-
OLINE TRUCK
OF THE WORLD"

Has proven its reliability, economy and long life by 12 years of real service in every line of transportation. The first Mack Truck, built in 1900, is still in active service at Tucson, Arizona.

□ That fact should be full of meaning for you.

□ When you buy *MACK TRUCKS* you do not buy *theory* but *history*.

□ *Capacities*: 1, 1½, 2, 3, 4, 5 & 7½ tons, with any load distribution and any style of body.

Consult us about your transportation problem.

The Canadian Fairbanks-Morse Co. Limited

OTTAWA :: SASKATOON :: CALGARY :: VANCOUVER
MONTREAL :: TORONTO :: ST. JOHN :: WINNIPEG

In answering advertisements kindly mention "The Review"

In one corner of the office will be located a large fireproof vault, manufactured by the Dominion Safe and Vault Co., next to which will be the accounting department. Located in the same end of the building will be a large office for the advertising department. The balance of the office space will be utilized by the heads of the various departments and their staff.

A pneumatic tube system will be installed for dispatching orders from the office and sales floor to the shipping department and from the shipping department to the different sections on the various floors of the building—also from the general office to the sales department on the ground floor. It is anticipated that this system will facilitate to a very great extent, as well as prove a great time saving device for, the handling of and shipping of orders. Every possible provision will be made for expediting shipments and giving prompt service to the Company's patrons.

Another facility that has already been arranged for is that of a number of motor trucks and light motor deliveries, several Mack trucks having already been ordered.

There will also be an inter-house telephone system and telegraph office.

The building is to be sprinkled with a modern sprinkler system.

It is expected that this will be one of the largest and most modern machinery and mechanical goods houses on the continent of America, and that the general finish and appearance will be second to none.

The plans for the building were prepared by Messrs. Parr, MacKenzie & Day, the well-known architects of Granville Street. This firm was established in Vancouver about eighteen years ago under the firm name of Parr & Fee and since then have designed and carried out a very large number of buildings in all part of the city. The following are a few prominent examples of their work:—The fifteen story Vancouver Block, the Europe Hotel, The Vancouver Ice Works, Leeson, Dickie & Goss Premises; all first-class fireproof buildings. Also The Baron Hotel and Annex, The Mount Pleasant Presbyterian Church, the eight story Sutherland Block, the eight story Borland Block, most of the large buildings on Granville Street, several theatres and a large number of private residences.

• • •

People throw stones only at trees with fruit on them.

Gasoline and Oil Power on the Farm

How Engines have Lightened Farm Work

The uses of the gas engine are legion. It is the mechanical chore boy of the farm, the Percy, or mechanical man of agriculture. It can be and is used in the house, in the barn, in the field and in the garden. There is hardly any place where there is work for a man to do that the gasoline engine cannot be used to advantage. It can be used in the house to run the washing machine and wringer, to pump water and furnish lights.

Many farmers have a small shop fitted up near the house where they have installed a shop for the repairing of tools, a laundry, an electric lighting plant, a cream separator, and perhaps a churn and other small machinery, all of which is run by a four or five horse-power engine.

An electric generator of two kilowatts capacity, with a storage battery, will light the house, the barn and the grounds; besides furnishing enough current to operate fans, flat irons, a sewing machine and perhaps a mechanical milker.

The cost of current so generated will not exceed ten cents a kilowatt hour, a figure that compares favorably with what the city dweller has to pay to the central station. If the shop can be built around the well, as many of them are, the same engine can also pump the water and deliver it to all parts of the farm buildings. One of these little machines makes it possible for every farm to have all the modern conveniences of the city home and at no greater expense.

Even if the same engine cannot be used to do all this work it costs very little to buy enough small units to take care of the various jobs that need to be provided for. The cost of a gasoline engine ranges from twenty-five to thirty-five dollars a horse-power, whether the engine be large or small, so there is no economy in buying one large engine. It is better to buy several and place them where they will be needed most of the time.

DOING FARM WORK WITH GASOLINE

Such engines will run on about a pint of gasoline per horse-power per hour, or with gasoline at sixteen cents a gallon, at a cost for fuel of only two cents a horse-power hour. The same amount of work with human labor will cost at least one dollar and twenty cents, for a man will charge at least fifteen cents an hour, and can do only one-eighth of a horse-power of work. Furthermore, you know when you set an engine at work that it will not loaf on the job, and you are getting the full worth of your money.

Announcement of Winner of FARM ENGINE CONTEST

AFTER a careful examination of the more than 5,000 lists submitted, Mr. J. C. McDonald, of *The Family Herald and Weekly Star*, who acted as chairman of the judges' committee, announces that the farm engine has been awarded to Mr. F. W. Crealy, of Strathroy, Ont. His list was selected as containing the greatest number of practical uses for

Fairbanks-Morse Farm Engines

¶The information gathered from the many lists submitted is of untold value. When 5200 intelligent Canadian farmers get down to analyzing the number of uses to which Fairbanks-Morse engines can be adapted on the farm, many valuable ideas are bound to result.

¶The best and most practical suggestions have been compiled and are being published in booklet form. This manual is full of interesting, instructive and money-saving information for farmers.

¶Only a limited edition will be printed and judging from the number of requests already received, this will be quickly exhausted. The first 5200 off the press will be reserved and mailed to the contestants; the remainder will be sent to those whose requests are received first.

¶If you were not a contestant, send in your name at once. Just write "Please mail me a free copy of '49 Uses for a Farm Engine.'" State whether you own an engine or not. Sign your name and address and send to



FARM BOOKLET EDITOR

The Canadian Fairbanks-Morse Co. Limited
MONTREAL

In answering advertisements kindly mention "The Review"

If the gasoline engine had been invented and brought to its present state of perfection a hundred and fifty years ago we would never have had human slavery in the South. No slave, no matter how hard the taskmaster, was ever able to compete with one of these mechanical men in the amount of work turned out in a day nor in cheapness with which such work can be accomplished.

Our teachers of agriculture tell us that if we are to maintain the fertility of our soils and make a permanent success of agriculture we must raise more live stock. To do this we must grind feed, shred corn fodder and put up ensilage. Cattle and hogs and sheep cannot be allowed to pasture on high-priced land ; they must be kept in the stables and fed. Here then is where the engine of a little larger size can and must be used. Engines of twelve to fifteen horse-power, either stationary or mounted on trucks so that they can be moved easily from place to place, are the ideal size for this heavy work. In addition they can be used to thresh the grain, and many farmers are so using them. There are a number of small separators on the market designed for just this purpose.

THE COST OF FILLING A SILO WITH POWER

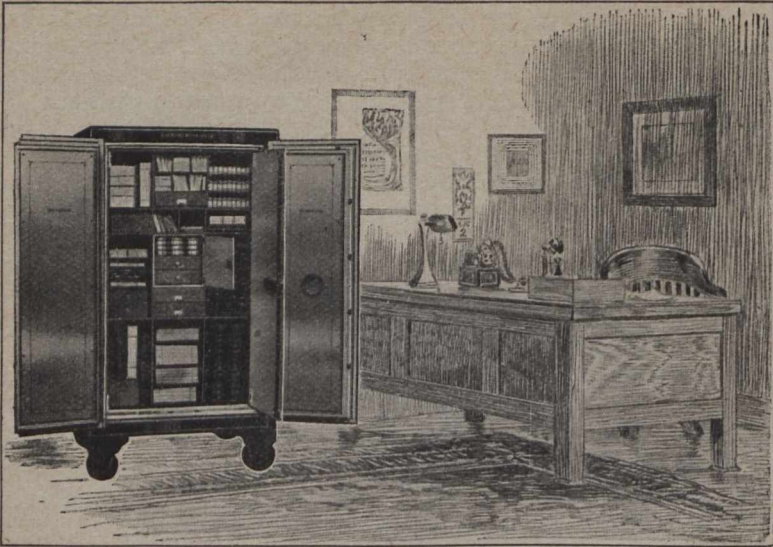
As an example of how efficient a gasoline engine is for filling silos all we need to do is to turn to a bulletin published by the Virginia Experiment Station which gives the report of experiments on the cost of filling silos with different kinds of power. It was shown in these experiments that the cost of filling a silo with gasoline engine power, using gasoline that costs thirteen cents a gallon, amounted to only two or three cents a ton as against two to seven cents a ton for steam engines using coal at five dollars a ton.

Another big field for the gasoline, or to be more exact in the use of terms, for the crude oil engine is in irrigation. Vast areas in Colorado, Texas and Kansas have been reclaimed with the use of such engines which pump from wells sixty, seventy and even eighty feet deep. Thousands of engines of from five to fifty or more horse-power are already in use and the number is daily increasing.

A gentleman who made a thorough study of conditions in the Louisiana rice fields last summer stated that in one parish in Louisiana alone there is an opportunity to replace fifteen hundred steam engines with an equal number of gasoline engines on account of the high price of coal and the difference in efficiency in favor of the gas engine.

Another large field of usefulness for the gas engine, though not directly concerned with agriculture, is in the cotton gins of the South. These are rapidly changing to the cheaper power.

In the fruit growing regions every fruit grower needs a gasoline spraying outfit and it requires one such outfit for every ten acres of



The Kind of Safe You Should Have in Your Office

The excellent design and appearance of a Dominion Safe in your office is clearly shown in the above illustration, which is taken from a prominent installation in Montreal.

These safes are as high grade as it is possible to produce.

DOMINION SAFES

have proven absolutely dependable by having preserved their contents unharmed in the worst fires of modern times. They are built along scientific lines by an experienced manufacturer. A thorough study of the effects of fire and other damaging elements have enabled us to design our safes for maximum strength and fire protection qualities.

The fire-proof composition used is far superior to any other known, and is more than a thick insulating wall. It is made equal to any emergency. Every feature of these safes, from the ball-bearing hinges and interlocking flanges to the drill-proof lock spindles, adds to the security of the contents.

Dominion Safes, built at Farnham, Que., will meet your every requirement, whether for home or office. A request for a catalog or for a salesman to call will be instantly complied with.

THE CANADIAN FAIRBANKS- MORSE COMPANY LIMITED

Winnipeg Calgary Saskatoon Vancouver Victoria
Montreal Quebec St. John Ottawa Toronto

In answering advertisements kindly mention "The Review"

orchard, because the time when spraying must be done is very limited and a day or two's delay means the saving or losing of a crop worth thousands of dollars.

Even the poultry farmer finds the gasoline engine indispensable for grinding bone and preparing food for his poultry, while market gardeners all through the humid belt circumvent the vagaries of the weather and overcome the handicap of a long drought by the use of some overhead system of irrigation. One manufacturer, who covers the territory east of the Mississippi River, has sold thousands of outfits that irrigate tracts up to ten acres or more in extent and prove sources of increased revenue to those forehanded enough to make use of them.

HOW MANY ENGINES ARE NECESSARY ?

Thus it will be seen that every farm, no matter what the produce thereof, can find profitable use for gas engine power. The small farm of only an acre or two needs at least one, while the large farms need several. One farmer writes that he has seven gasoline engines and finds them indispensable, while another reports five. A man engaged in mixed farming in Minnesota declares that every farmer on a quarter or a half section farm ought to have at least three engines of two, six and twelve horse-power, respectively. This man started out a few years ago with horses and men as his only source of power, and now has adopted gasoline engines everywhere he possibly can. He still uses horses, it is true, but with the small engines about the farm and a tractor in the field he finds it easy and more profitable to dispense with a large number of surplus horses and keep fewer hired men.

As an example of the value of one of these engines for special service, consider the special binder engine, which, mounted on the rear of a binder, operates the sickle and binder head and thus dispenses with two horses. Where the grain is heavy or the ground muddy it requires at least four horses on a grain binder, but with an engine to operate the working parts of the machine, two horses are sufficient. This was discovered a number of years ago in the Red River Valley when a heavy rain came on just when the grain was ready to harvest. The straw was very heavy and the soil so saturated with moisture that the wheels would fill up with mud and refuse to turn. A number of people then resorted to a gasoline engine fitted up on the rear of the binder, and in that way all that was saved that year of the wheat crop of the valley was saved by the aid of gasoline. Since then there has been a growing demand every year for binder engines. Wherever the grain is very heavy the little engine will relieve one team and do the work easier and cheaper. Last year owing to the heavy straw, these engines were

shipped from the factory to the grain fields in carload lots by express.

In parts of the country where there is much tile draining to be done special gas engine driven ditchers are coming into use. Some of these are home made, some factory made. An example of one of the former type came under the writer's observation not long since in Iowa. It is fitted with a fifteen horse-power gasoline engine and is capable of digging twenty rods of trench a day for 36-inch tile at a fuel cost of only five dollars. There are millions of acres of land in this country that need drainage, and it is such machines as these that will make the work possible. If we had to depend upon human labor to do all the excavating the cost would be well nigh prohibitive, even though tile draining doubles and in some cases trebles the value of the land. One of these machines can easily do as much in a day as fifteen men.

THE EXPERIENCE OF FARMERS WITH GASOLINE

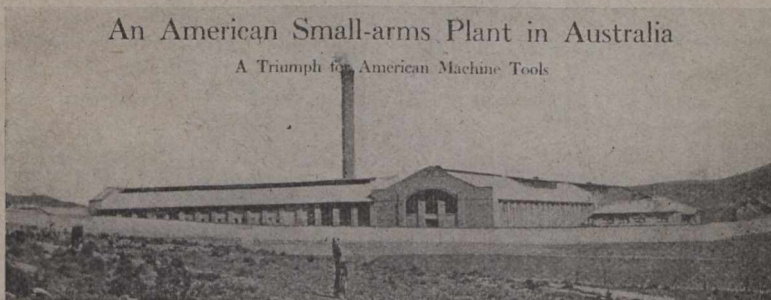
Instances of the use of gasoline engines could be multiplied almost indefinitely. The experience of farmers everywhere are the same. Listen to what a few of them say in regard to this subject. Here is one from Indiana. He writes: "Three years ago I purchased a two horse-power engine to pump water from a hundred and fifty foot well. In the fall we used it to cut corn fodder, then fitted it up to a wood saw and later to run a small feed grinder. If I were buying another engine I would get a larger one, but I only expected to use this one for pumping until I realized its adaptability and added the other duties."

An Illinois farmer reports as follows: "We have three engines on our farm, one is two and a half horse-power, one six and the other eighteen. The small one is used for pumping water, washing, sawing wood and for all small jobs. I got the six-horse engine to run the corn dump and to help out the small engine. Later, I converted it into a tractor to more easily take it to the various jobs I wanted done. It is a success too. The big engine is used to run a feed mill and has ground thousands of bushels of corn and oats for cattle feeding."

A New York farmer, evidently a poultryman, writes that he uses his seven-horse engine to run a pneumatic ensilage cutter, a meat chopper and a bone grinder, while a Nebraska farmer who kept an accurate record of his work writes that he sawed eighty-four loads of pole wood, each load averaging three quarters of a cord, in fifteen hours and fifty-five minutes and used only four and a half gallons of gasoline.

From all parts of the country come the same reports of adaptability, efficiency and economy. We are only at the beginning of

the use of power in agriculture, but its use is spreading with tremendous rapidity. The era of power farming is upon us, and it seems destined to work almost as much of a revolution as did the entrance of mechanical power in manufacturing.—SCIENTIFIC AMERICAN.



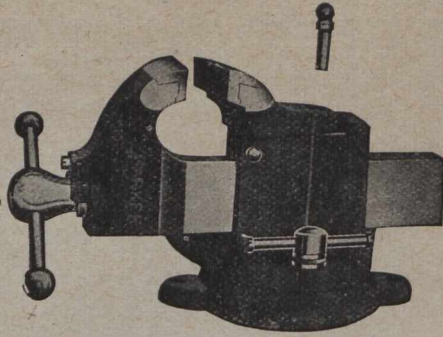
A notable small arms manufacturing plant has recently been installed in Australia by the Government to manufacture military rifles. The contract was made under the auspices of the British Government, the rifle to be produced being identical with that with which the British army is now equipped, known as the Lee-Enfield.

This gun is one of the many adaptations of the original Lee gun—an American invention—the first one being made years ago in the works of the Pratt & Whitney Company at Hartford, Conn. The well-known Mauser is a Lee pattern, and the same principle is used in the guns of all the European armies. In the United States it is called the Springfield.

Bids were called for in London to furnish a plant to make Lee-Enfield guns at the rate of 50 per day. When Pratt & Whitney applied for permission to bid, it was thought by the management of the Royal Arsenal that it would be impossible to make this plant outside of England, as it would be out of the question to have access to the British gauges, and the Australian gun had to absolutely interchange in all its parts with the British weapon. The American experts, however, stated that if the British gun was made on the interchangeable plan, and their firm would be furnished with a gun, it would agree to produce one that would interchange with the other, creating its own gauges from the gun itself.

The arsenal authorities were very sceptical as to this, and remained unconvinced until it was actually accomplished.

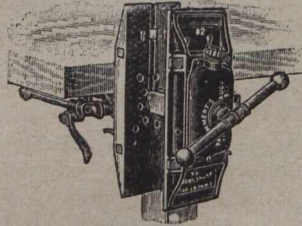
When the bids were received it was found that the American proffer was almost identical in amount with that of the most favored English firm. The latter, however, included in its



The Vise ^{with} *the Strong Front Jaw*

THE weakest part of all Vises is the front jaw. The Parker Machinist Vise shown above, besides having the slide made solid for over five inches from the front end, has a solid steel strengthening bar. This bar is inserted the whole length of the slide and thoroughly welded into the casting, thus rendering the slide, or movable jaw, practically unbreakable. No other vises made have this feature. The Parker is the strongest and most durable vise on the market.

UNIVERSAL WOODWORKERS' and PATTERN- MAKERS' VISE



THEN shown here is the standard vise for woodwork of all kinds. With this vise you need never twist or bend yourself to suit your work, but just let the vise turn the work in any position or direction and hold it to suit your comfort. The Emmert Universal Vise has seven pairs of jaws, so that it is adapted to grasp any kind of work. It is a great time and labor saver.

Ask for Catalog No. 16

The Canadian Fairbanks-Morse Co. Limited

MONTREAL, ST. JOHN, N.B., OTTAWA, TORONTO, VICTORIA
CALGARY, WINNIPEG, VANCOUVER, SASKATOON

In answering advertisements kindly mention "The Review"

tender some seven hundred machines to produce 50 guns in a working day of ten hours, as against less than three hundred included in the Pratt & Whitney bid. This, naturally, caused considerable discussion, as the Pratt & Whitney price was the same for less than half the number of machines, showing the price per machine to be much higher.

The two firms were then asked to state how many working hours would be required per gun. Pratt & Whitney gave a guarantee that its plant would produce this particular gun at the rate of 23 hours per gun, while the English firm gave just double this time, and intimated that the American firm could not possibly make good its time; and called attention to the fact that in the Royal British Arsenal something like 72 hours was required per gun. A most interesting situation was thus created.

Finally the Australian gun expert, Commander Clarkson, was dispatched to America to investigate the subject, which he did in a most able and thorough manner, the result being that he reported the art of gun-making, as developed by the Pratt & Whitney Company, to be many years in advance of anything that he had been able to find elsewhere; and recommended in the strongest terms that the award be given to them, and this was at last done.

It was understood that the British gun was being billed to the colonies at cost, which was figured at something over \$21, while the American guarantee as to working hours per gun meant a cost of about one-third of this amount; in other words, on an order for 100,000 guns it means a difference in the cost of, say, \$800,000 against \$2,100,000.

The arsenal plant set up in Australia is now completed and fully in operation; is accepted under the guarantee and paid for.

The machinery was tested before shipment for the manufacture of 100 guns, and it was shown that the 23-hour guarantee could be materially lessened. Some of the sample guns made at Hartford were submitted to the British War Office, where they were thoroughly and critically tested, and a report rendered that was most satisfactory.

Thus an equipment of about 300 American machines was shown capable of producing double the amount of work that 700 British machines could produce, and there seems to be no other explanation of the facts.

We frequently hear of the superiority of American machine tools, but it is seldom that such a clean-cut case of comparison can be had; hence this transaction is highly interesting.

The Ross Rifle Co. of Quebec, who furnish the Canadian Government with rifles, is equipped throughout with Pratt & Whitney machinery.

Economics of the Farm Tractor

The New Way of Tilling the Soil and What it Means

Since the very dawn of time, agriculture has depended upon the muscular power of men and animals to perform all of its heavy work. Even after all the other great industries had adopted steam or gas or electricity, agriculture continued to plod along in the time-honored custom, because, forsooth, nothing else was available. This condition continued until very recent times. About a dozen years ago the steam tractor was developed sufficiently to attract the attention of many of the large western grain farmers and then, less than ten years ago, the gas tractor, using gasoline or low-grade kerosene for fuel, made its first appearance. From that time forward the pace has been rapid.

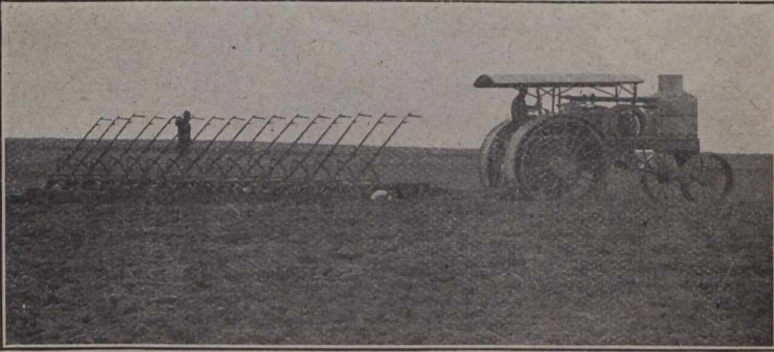
Farmers everywhere are now talking about power farming and thousands have become converts to the new idea. Six years ago there were not to exceed five hundred gas tractors in the United States. Last year more than thirteen thousand were sold, and this year the factories of the United States will turn out no fewer than twenty thousand. Five thousand of these will be sold in western Canada. Of the remaining fifteen thousand, some will go to South America, some to Russia and some to the various countries of Europe; but the greater number will be sold to the farmers of the United States.

Next year more than twenty thousand will be made and sold. The demand is greater than the supply and continues to increase from year to year. There are now more than eighty companies engaged in their manufacture, and new ones are being formed almost weekly. Such is the condition of the business, and its prospects for the future seem very bright indeed. It looks as though the commercial success of the automobile were to be repeated in the farm power field.

All this activity is easy to understand when one comes to consider the immense expenditure for power necessary to conduct the agricultural operations of the country. The total cultivated area of the United States is 477,488,000 acres, of which a little more than 43,000,000 is annually devoted to the hay crop, thus leaving about 435,000,000 acres that must be plowed and made ready for the crop each year. It is estimated that the average work necessary to plow an acre is about ten horse-power hours. At the Winnipeg Motor Contest last year the average of all trials showed that it required 15.41 horse-power hours to plow an acre, so the figure selected appears to be on the safe side. Using this as our power factor, we find that the total expenditure of power for plowing the ground ~~once each year~~ is 4,350,000,000 horse-power hours. In order to accomplish this task and do the other necessary work,

which amounts to more than twice as much additional, there were, on January 1st of the past year, according to the report of the Secretary of Agriculture, 24,092,882 horses and mules on the farms of the United States. Their total value, as given by the same source, was estimated at \$2,698,351,000. The average value per head is thus \$112.53, which is certainly low enough. These animals are maintained almost exclusively for farm power use, and do not include those used in cities and villages. If we take into account the harnesses and other gear required before this power is available, estimated at fifteen dollars per animal, it is evident that the farmers have the prodigious sum of three billion dollars invested in power equipment.

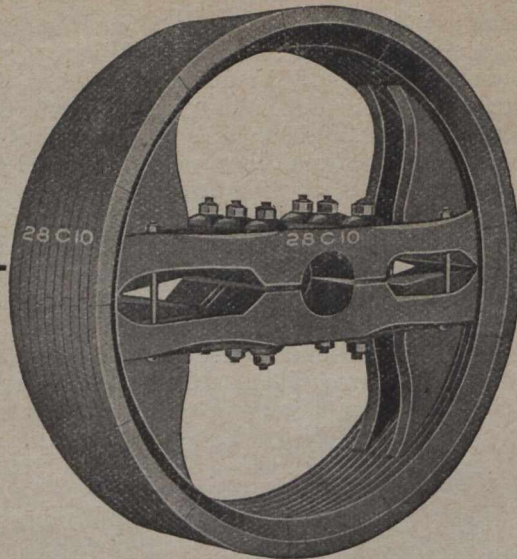
If we assume in round numbers 480,000,000 acres as the total cultivated area, and three billion dollars as the investment, a



Plowing with a Fairbanks-Morse Tractor

little calculation will show that the farmers of this country have an average of \$6.25 an acre invested in animal power. This sum seems excessive, but as a matter of fact it is greatly exceeded by many farmers. The truth of the figures becomes apparent when one considers that they provide only two work animals to each forty acres of cultivated land. Besides, the estimated value per animal is very low. There are hundreds of farms where the cost per acre is greatly in excess of the figure given.

Authorities differ as to the annual cost of keeping a horse. Grisdale, of the Ottawa Experimental Farms, reports an annual cost of \$99.80 for each of the nineteen horses at the station farm. Burkett, of the New Hampshire Station, reports the average cost of keeping five horses at \$74.33 each, while Cooper in Minnesota found the farm cost of keeping horses to vary from a minimum of \$65.23 to \$90.40. If we assume an average cost for the entire country of \$75 per head, which seems reasonable in view of the above figures, we find the total cost of maintenance



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WOOD SPLIT PULLEYS

IN buying wood split pulleys, as in the purchase of other things, the careful up-to-date buyer selects the well known make of proven worth every time. There is always a legitimate reason for the fame of a good product, just as there is a reason for a book becoming a classic.

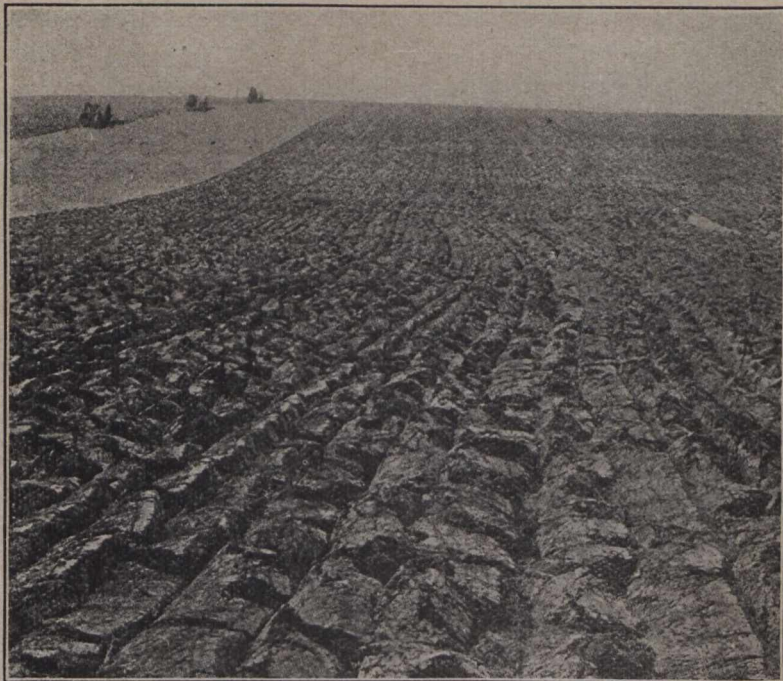
Q Besides all the other good features of the Fairbanks Wood Split Pulley, there is one that distinguishes it from other makes and puts it in a class by itself. *It is the web.* This web being mortised into the arms and rim, holds the whole pulley together securely. This feature overcomes one of the greatest objections to the wood pulleys, the separating of the rim from the arms.

Ask for a copy of our "Transmission Catalog."

The Canadian Fairbanks-Morse Co. Limited

MONTREAL TORONTO OTTAWA CALGARY WINNIPEG
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The Way Tractors Turn up the Soil

of this important industry reaches the enormous sum of \$1,805,466,150, or \$3.76 per acre.

The total value of all agricultural products for the year 1911, as estimated by the census, is \$8,417,000,000, which amounts to \$17.53 per acre for the entire United States. From this it will be seen that it requires 21.4 per cent. of the products of the farms to maintain their work animals. In other words, more than one hundred million acres are required to raise food and pay for the maintenance of the horses and mules of the United States. Truly this is an enormous tax upon our national resources and at a time, too, when the production of human food is not keeping pace with our increasing population. Is it any wonder that farmers are looking toward mechanical power with with eager hopefulness? These animals do not furnish food or clothing directly, and hence their total cost must be chargeable to the annual national farm power bill. In this discussion, it should be especially noted that we have omitted all interest and depreciation charges. If these were taken into account, we should have to add about sixty-two cents more to the mainten-

ance charge per acre, which would bring the total up to \$4.38, or almost exactly twenty-five per cent. of the country's agricultural production annually.

While perhaps few farmers have ever kept an accurate account of the cost of keeping their work animals, they are, nevertheless, aware that they are paying an enormous price for the power needed to do their work. Not only are they paying a heavy price for the power itself, but the fact that it is divided up into such small units makes it necessary to employ many extra laborers during the busy season. The change to mechanical power operates in agriculture just as the adoption of improved machinery in manufacturing. It reduces the number of men required to perform a certain piece of work, and thus reduces the cost.

Owing to the nature of farm work and the fact that there is a long idle period during the year, it is difficult to maintain enough laborers in the country to do the work during the busy season. This fact, coupled with the high maintenance cost of work animals, has turned the minds of farmers toward mechanical power. They figure that they can well afford to buy a tractor instead of keeping a dozen or more horses. The tractor does not require special attention during the times it is idle. It does not cost anything for fuel while idle. It does not require as many operators as the horses it replaces, and it is able to turn out more work in a day. Moreover, it is able to work longer hours and during the hottest weather. The speed with which it can prepare a field for a crop or seed the ground after it is prepared is an important item, for it is well known that the yield often depends upon the soil condition when the ground was plowed or the moisture content of the soil when the seed was planted. A rapid machine like a tractor enables the farmer to take advantage of soil and climatic conditions much more successfully than when he depends upon horses.

It is true that the tractor is not adapted to the small farmer. It costs too much. Prices now range from \$1,200 to \$3,000. The higher price is for the larger machines which will develop anywhere from fifty to eighty horse-power.

These machines can easily do as much as twenty-five or thirty horses, while the smaller machines, which will develop from fifteen to forty horse-power, are fully equal to ten or a dozen horses. The first cost of the larger machines is not much if any greater than of the horses which they replace, while the cost of the smaller machines is not greatly in excess.

It is the general opinion of well informed tractor men that it will pay any farmer who has two hundred or more acres under cultivation, if his land lies right, to purchase a gas tractor. For

a farm of that size he will need one of the smaller machines. His power bill for the year should then figure about as follows :

Interest at 6 per cent	\$ 72
Depreciation.....	200
Fuel, oil and labor.	160
Total	\$432

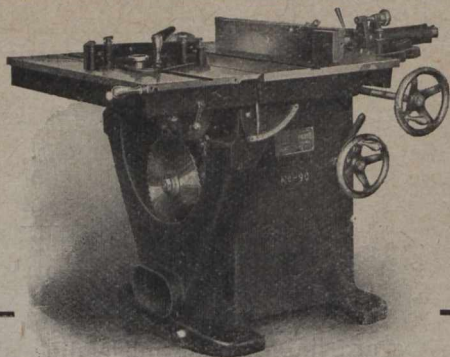
At the average of \$4.38 for all horse labor the total would have amounted to \$876. These figures show a gain of \$344 for the tractor.

Any set of estimates are liable to be misleading. Much depends upon the character of the farm where mechanical power is contemplated as to whether it will pay to make the change or not. The kind of farming and the mechanical ability of the farm owner or manager are the items that must come in for careful consideration. Perhaps the best way to approach the subject, and thus arrive at the fact, is to consider the experiences of those who have used gas tractors.

There is no place in this country where power farming is carried on more extensively than around Beach, N.D., and Wibaux, Montana. The farms are large and horses are used merely for driving purposes and to haul light loads from town if the farmer does not possess an automobile. All the heavy work, such as plowing, disking, seeding, threshing and hauling the crop to market, is done with tractors. Many steam tractors are used, but gas tractors are the favorite.

As an example of the amount of work a tractor can do in a season, take the record of E. G. Paul, one of the Beach tractor farmers. Last year he plowed 810 acres of sod, disked 800 acres, seeded 1,600 acres, harvested 1,440 acres and threshed and then hauled his grain to market, besides doing a considerable amount of road grading. E. A. Beasley, a prominent farmer near Lake City, Iowa, says he finds his tractor more economical and satisfactory than horses. Joe Edgington, another Iowa farmer, reports that it cost him less than eighteen cents an acre to do his plowing last fall with an engine burning distillate. He used two and three quarter gallons an acre, which cost him six cents a gallon.

The most of Montana has been developed with mechanical power, and the three western provinces of Canada depend upon it. It would seem if these Canadian farmers can make power farming pay that the farmers of the United States would certainly find it profitable. In order to obtain some idea of the cost of operation and to obtain an expression of opinion regarding the efficiency of the tractor, I sent out a list of questions to forty-four Canadian farmers, asking the cost of fuel, cost of outfit, labor charges, repairs, etc., and finally asking for an



Oliver Universal Saw Bench Is a Great Time Saver

THIS machine has no limitations among woodworkers. It is the most modern and efficient double arbor rip and cross-cut saw bench obtainable.

□ Its durability, accuracy, ease of operation and quickness of adjustment make it a wonderful time saver.

□ Let us tell you more about the *Oliver Universal Saw Bench*. You can depend upon Oliver machines. They are all high-grade products.

Write for Circular giving full description.

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mention "Review"

In answering

expression of opinion in regard to the future of the gas tractor. Eleven replies were received and every one expressed the opinion that the gas tractor would soon displace every other kind of power in Canada. This, too, in face of the fact that tractors cost twenty-five per cent. more than in the United States, and fuel fully twice as much. Several reported using gasoline that cost twenty-seven cents per gallon, and yet they were enthusiastic for the gas tractor.

The work reported as being done by tractors covers a wide range and includes all field operations, such as plowing, seeding, harvesting, hauling to market, threshing, corn shredding, grinding, baling hay, filling ditches, and road grading.

There is no question but we have entered upon a new era in agriculture. The farmer desires the comforts and advantages of the city dweller, and these he gets easily and cheaply with the small gasoline engine. He sees that the gas tractor is suitable for the heavier field operations, and is generally more economical than horses, and he is not slow to make the change. It enables him to accomplish more in a season. It multiplies his capacity and gives him either more leisure or enables him to farm a larger area and increases his income.

Power farming has just begun, and the start is encouraging. Whether it will accomplish the revolution in agriculture that it has in manufacturing and transportation only time can decide, but it seems safe to predict that it will bring about many interesting social and economic changes.—SCIENTIFIC AMERICAN.

• • •

Your Attitude Towards Your Task

The man conscious of that power which makes him master of the situation has his task half performed by the manner in which he approaches it. He who walks up boldly and faces his difficulty without wincing does not have so hard a time in overcoming it as the man who goes to it timidly, wavering between fears and doubts. It makes all the difference in the world whether one approaches his task with the air of a conqueror, with firmness and decision in his face, with clenched fists and grit that knows no defeat, or whether he goes with the expectation of not being equal to the undertaking.

It is not enough to be willing to do hard work, not enough to be honest and reliable; there must be iron in the blood, courage which dares.

We know men who start out on a new proposition with the idea that if it is not too difficult, if they do not meet insurmountable obstacles, they will go through with it.

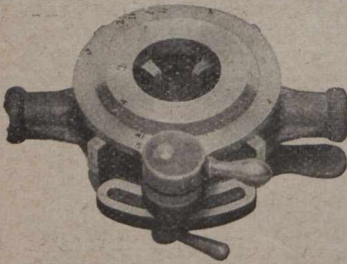
The determined soul does not recognize insurmountable difficulties. He knows that if one thing will not do, another will. He sees the end, and makes for his goal.

There is nothing like a vigorous initiative which is not afraid to undertake things no matter how difficult.

The young man who sees the obstacles ahead of him stand out more clearly than anything else is not the man to undertake great things. The man who does things is the man who sees the end and defies the obstacles.—DR. ORISON SWETT MARDEN.

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THE next issue of the "Review" will be out in April. Ask us to place your name on our free mailing list.



Bull Dog Pipe Threading Stocks

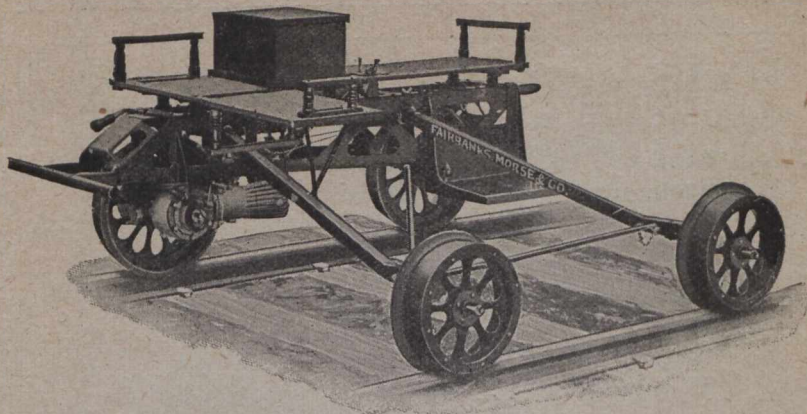
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THIS UNION IS GUARANTEED
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GET THEM FROM YOUR JOBBER



You Can Save \$50.00 Per Month With This Car

ECONOMY is the railroad man's watchword all the time. Reduction of expenses is necessary, but efficiency must be maintained, otherwise you produce a condition the very reverse of economy.

¶ It has been practically and positively demonstrated that the expense of track maintenance can be greatly lowered by the use of gasoline section motor cars. An actual saving of \$50 per month per car is being made in regular section work, and in many instances it is even more than this.

¶ You will find our catalog, "Fairbanks-Morse Motor Cars for Railroad Work," intensely interesting and you certainly should have a copy on file. Our cars have been brought to high perfection by fifteen years' manufacturing experience in this line of work.

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The Canadian Fairbanks-Morse Co. Limited

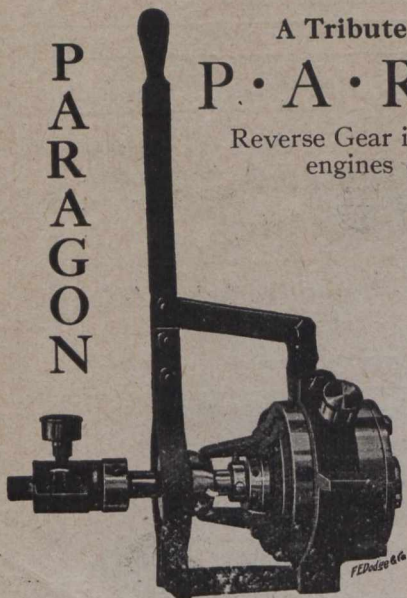
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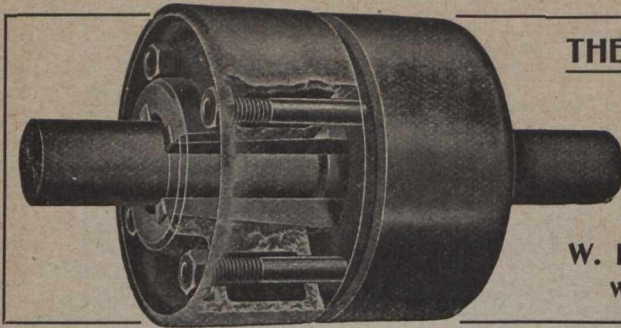
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highest candle powered,
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lene burner made. Hexagon base
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What this Coupling hath joined together, no strain can put asunder. ∴ ∴ ∴

W. H. Nicholson & Co.
WILKES-BARRE, PA.

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Auto Style
For Nuts only—6, 8 and 10 inch.

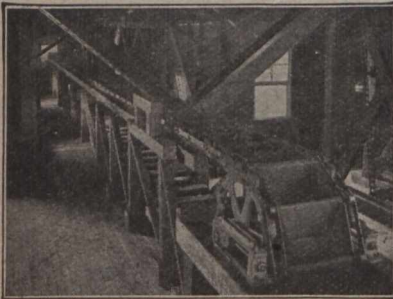


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Webster Elevating and Conveying Equipment.

Embraces all Types, for handling all materials, under all sorts of conditions.

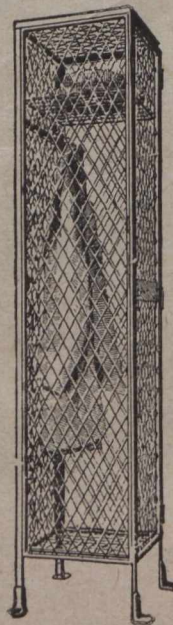


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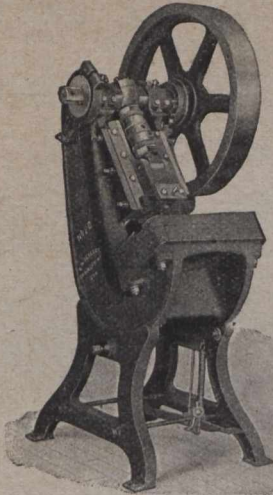
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TO THE

**GEO. B. MEADOWS
CO. LIMITED**

479 Wellington St. W.
TORONTO

In answering advertisements kindly mention "The Review"

Bliss Inclinable Power Presses



HAVE NO EQUAL FOR CONVENIENCE, DURABILITY AND WIDE RANGE OF USEFULNESS

THE bodies are inclinable and convenient for handling dies and material; they combine a strength and rigidity that minimizes the maintenance costs of both machines and tools. The slides fitted with positive knockouts are long and well gibbed.

Q Built in eighteen sizes they are adapted for nearly all the operations in the manufacture of tin cans, pierced tinware, metal packages, electrical goods, brass goods, trimmings, etc.

Q Catalogue No. 1 B, describing them will be sent on request.

"BLISS PRESSES FOR EVERY REQUIREMENT"

E. W. BLISS CO.

20 John St., Brooklyn, N. Y., U.S.A.

London Office:

Pocock St., Blackfriars Rd., London, E.C., England



ELECTRIC LIGHTING SYSTEMS FOR AUTOMOBILES & MOTOR BOATS

A clean, powerful and reliable light free from danger of fire or explosion and with double the efficiency of gas or oil. Easily installed on any car or boat. Send for complete catalogues. Give name and model of car or size of boat in writing.

Sold by dealers everywhere.

The Apple Electric Co.

30 N. Canal Street,
Dayton, O. U.S.A.



\$5,000,000.00

FIVE MILLION DOLLARS WORTH OF MIXED METALS MARKETED YEARLY

There is a reason why Hoyt Anti-Friction Metal runs longer and cooler than others

It possesses above all other metals the property of filling in and smoothing down the small holes in the journal, and imparts to both the journal and bearing a smooth and highly polished surface. Sold in three grades—Peerless, Anti-Friction and Bearing Metal.

HOYT METAL CO. TORONTO

In answering advertisements kindly mention "The Review"

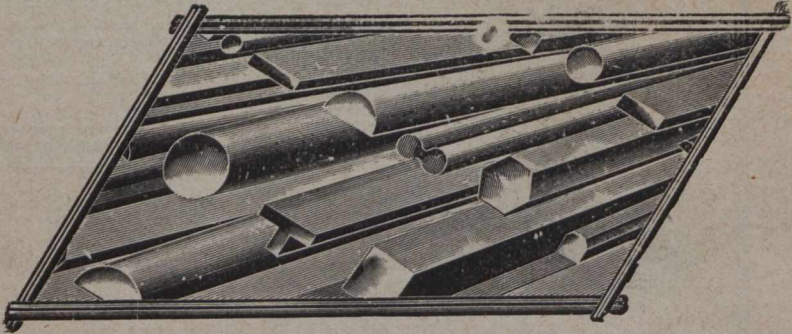
Union Drawn Steel Co. Limited

MANUFACTURERS OF

Bright Finished Steel SHAFTING and SHAPES

SEND FOR PRICE LIST

Office and Works: **HAMILTON, Canada**



LARGE STOCK OF

Rounds, $\frac{1}{8}$ " to 6"
Squares, $\frac{1}{4}$ " to 2 $\frac{1}{2}$ "

Flats, $\frac{3}{8}$ " x $\frac{1}{8}$ " to 3" x 1 $\frac{1}{2}$ "
Hexagons, $\frac{1}{4}$ " to 2"

Set Screws
Cap Screws
Semi Nuts

JOHN MORROW
Screw and Nut Coy. Limited.

If you buy from the jobbers insist on the best.

"The best is 'MORROWS'"

INGERSOLL

::

ONTARIO

JOHN MONCRIEFF Limited

PERTH, SCOTLAND

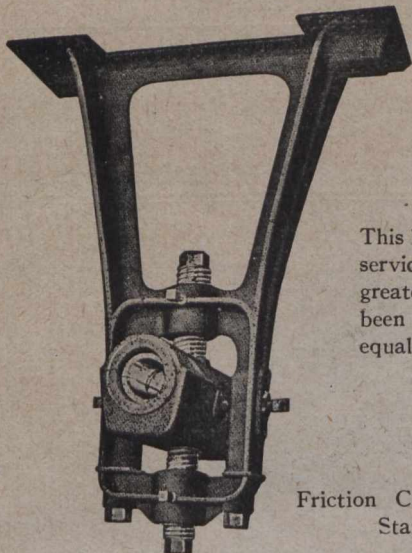
Manufacturers of "Perth" and "Unific" gauge glasses for which 13 Highest Awards have been gained at Exhibitions.

The "Perth" gauge glasses are generally recognized to be the best green quality of gauge glass on the market.

The "Unific" gauge glasses are the result of prolonged research and exhaustive experiment, being specially manufactured for the highest steam pressure boilers. They do not corrode, and withstand great variations of temperature.

13 FIRST AWARDS, DIPLOMA OF HONOUR, BRUSSELS, 1910.
Gold Medal, St. Louis, 1904, Edinburgh, 1890, Highest Award, Chicago, 1893.

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DOUBLE BRACE RING OILING ADJUSTABLE HANGERS

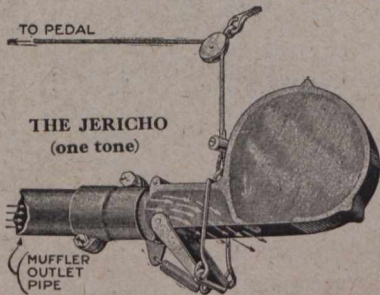
This hanger is designed for the most exacting service, being of such proportions as to secure greatest possible strength. None has ever been known to fail. Length of the bearings equals five times the diameter of the shaft.

POWER TRANSMISSION APPLIANCES

Friction Clutches, Tighteners, Pulleys, Floor
Stands, Collars, Rope Sheaves, Etc.

T. B. WOOD'S SONS CO. Chambersburg, Penn.

Jericho ONE TONE *Horn* *Jubilee* CHIME TONE *Horn*



The Signal of a Gentleman—Warns without Offence
DEMAND IS THE INDEX OF POPULARITY

Over One Hundred Thousand in use To-day

The prospective purchaser cannot disregard the merits of Jericho—simple, economical, ever-ready, pedal-operated, tone-insistent, yet not startling. Every user is your salesman!

The Jubilee Horn is constructed on the same lines of durability as the Jericho. It fills the requirements of those who prefer a two-tone signal.

Jericho cost \$7, \$8, \$9, according to size.
Jubilee cost \$8, \$9, \$10, according to size.

Complete catalogue of automobile accessories mailed free.

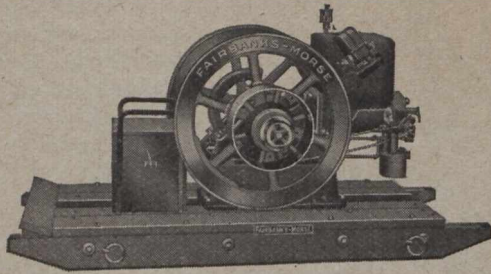
The Randall-Faichney Co. Manufacturers Boston, Mass.

Also manufacturers of the Famous B-Line Guns, Jericho Gas
Regulators and MacKae Blitz Spark Plugs

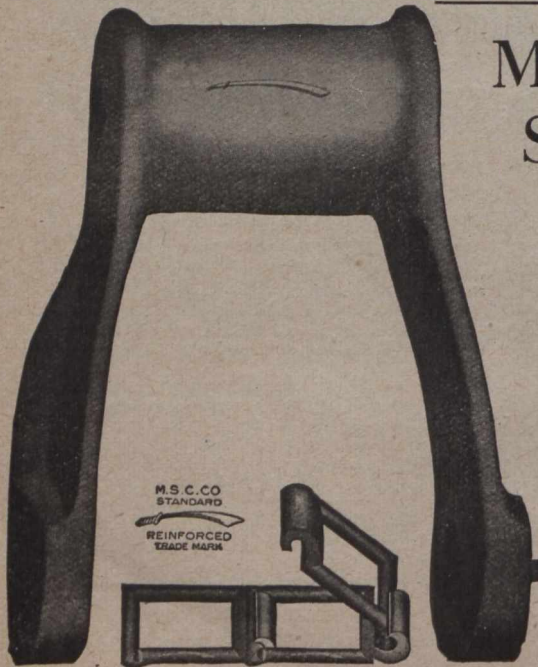
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MACHINERY CUTS

THAT DO JUSTICE TO YOUR MACHINES



SUPPLIED AT SHORT NOTICE BY
THE MORTIMER CO. Limited
 MONTREAL :: OTTAWA :: TORONTO



Michigan Sprocket Chain Co.

MAKERS OF

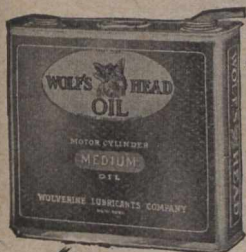
Detachable Sprocket
Chain, Riveted Drive and
Special Chains, Wheels,
etc., etc.

DETROIT, MICH.

For Sale by

**The Canadian Fairbanks-Morse
Company Limited.
MONTREAL**

In answering advertisements kindly mention "The Review"



Better Work With This Oil

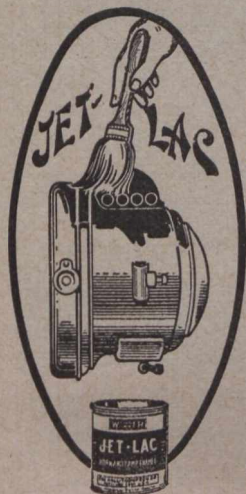
QWe have proved this to those who have to know the requirements of the Gasolene Motor—the manufacturers themselves.

QAmong the famous manufacturers who already use or recommend Wolf's Head Oil are:

- | | | |
|-------------------------------|-----------------------------------------|-------------------|
| Willys-Overland Co. | Isotta Fraschini Motors Co. | Sampson Truck |
| Hudson Motor Car Co. | Paige-Detroit Motor Car Co. | Brush |
| Hupp Motor Car Co. | Walter Auto-Truck Mfg. Co. | Matheson |
| Midland Motor Co. | Van Blerck Motor Co. | Oldsmobile |
| Gray Motor Company | Makers of the engines used in Reliance | Marion |
| Columbia Engine Co. | IV, Kitty Hawk II, Gretchen II, Dis- | Atlantic Boat Co. |
| Detroit Engine Co. | turber III, Baby Reliance III, etc. | Stutz |
| Stoddard-Dayton | Gas Engine & Power Co., and | Fifield Brothers |
| Warren Motor Car Co. | Chas. L. Seabury & Co., Cons. | Blount & Lovell |
| Crane Brothers | Electric Launch Co. (Elc ^o) | Maxwell |
| Makers of the Dixie IV Engine | Reliance Motor Boat Co. | Columbia |

The Canadian Fairbanks-Morse Company Limited
CANADIAN DISTRIBUTORS

Wonder-Worker Motor Car Specialties



SAVE polishing by refinishing your lamps with Jet Lac. Make your lamps look up-to-date. A phenomena of air drying enamels. Dries in two hours, will not crack or scratch off and is not affected as ordinary enamels by kerosene, oil or gasoline. Can be applied by anyone. The only real enamel for finishing lamps, horns and all metal accessories on high grade cars. Dull or bright finish.

Half Pint Cans, 75 cents

Enough for Finishing Set of Lamps

WONDER-WORKER METAL POLISH

Gives a brilliant and lasting finish, with very little work and exertion and will positively remove all spots, stains and tarnishes. Immediately imparts a brilliant and lasting durable lustre to brass.

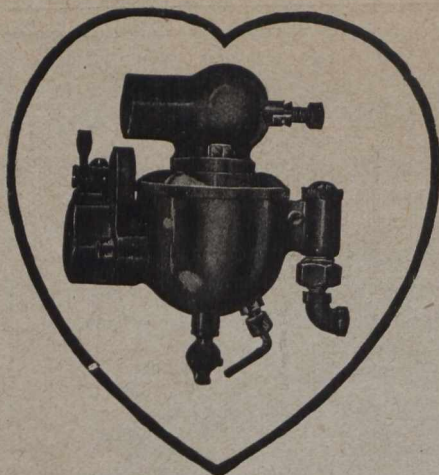
Positively Will Not Settle or Cake Up in Cans

Free from scratching, most economical, clean, and speedy. Sold on its merit. Contains nothing to injure or chap the hands. Outshines them all.

FOR SALE BY

The Canadian Fairbanks-Morse Co. Limited, Montreal

In answering advertisements kindly mention "The Review"



The Schebler Carburetor

Used by 80% of the Gasoline Engine Builders of this Country.

It is the basis of comparison for all others.

It will solve all your difficulties and change all unpleasantness to the happiness incident to a perfectly running engine.

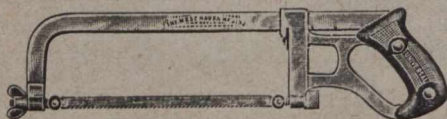
Made in several sizes and styles.
Send for Catalogue.

Manufactured by

WHEELER & SCHEBLER

INDIANAPOLIS, IND., U.S.A.

• No False Teeth •



In the UNIVERSAL HACK SAW. Try and See

West Haven Mfg. Company

NEW HAVEN :: :: :: :: CONN.

Sold by the Canadian Fairbanks-Morse Co., Limited



Wizard Magnetos

Do you wish to eliminate trouble and expense?

Why not give the WIZARD a trial?

It has been standard equipment for 10 YEARS on a majority of most popular Engines.

SIMPLE - EFFICIENT - DURABLE
Write for catalog I-R.

HERCULES ELECTRIC CO.
Indianapolis, Ind.

STRONG—DURABLE—ECONOMICAL

TAYLOR'S SPIRAL RIVETED PIPE

For HYDRAULIC-MINING and WATER-SUPPLY-LINES

Easy to transport and install. Connections with our forged steel flanges or forged steel bolted joints are quickly made and are absolutely tight. *New valuable 80-page Catalog No. 6-Q sent on request.*

New York City

American Spiral Pipe Works Office and Works: Chicago

In answering advertisements kindly mention "The Review"



Fig. 1188

THE GOULDS "FRUITALL" BARREL SPRAYER

The "FRUITALL" is a high grade sprayer of simple design which sells at a moderate price.

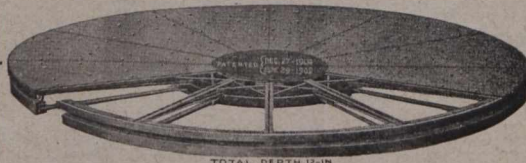
It has sufficient capacity for two leads of hose. All working parts are of bronze. In every way it is a thoroughly reliable outfit that will last for years.

SEND FOR FREE BOOK

"How to Spray—When to Spray—Which Sprayer to use"



THE **GOULDS** MFG. CO.
LARGEST MFR. OF **PUMPS** FOR EVERY SERVICE
121 FALL STREET :: SENECA FALLS, N.Y., U.S.A.



TOTAL DEPTH 12-IN.



CONCRETE ANY DEPTH AND GROOVED TO WATER DRAIN

"Universal" Automobile Turntables

Q Made in four diameters 12 ins., 14 ins., 15 ins. and 16 ins. respectively. Supporting capacity 8,000 lbs. The Table for every use—one for yours.

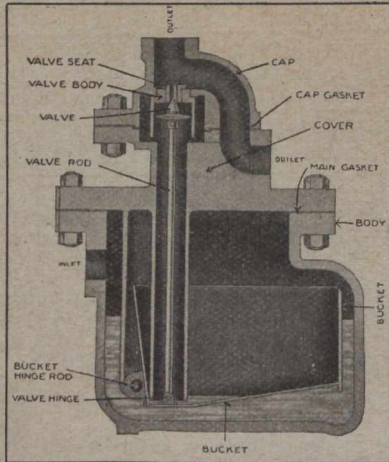
Q But 12 ins. in depth so they can be placed in either ground or upper floors. Have Patented **Serpentine Ball Bearing Race Courses** which eliminate 50% of Turntable friction. Are constructed to revolve so easily that a child can turn them.

Q Construction entirely of boiler plate, steel trusses and best quality of gray iron castings. Excellently proportioned with weights exactly where needed.

Why not order yours today? Write for prices.

The Canton Foundry & Machine Company
CANTON, O., U.S.A.

In answering advertisements kindly mention "The Review"



STRONG STEAM TRAPS

REPRESENT ECONOMY

They are easy to inspect—The cost of maintenance is small—They are subject to a long life.

REGISTERED

WRITE FOR OUR
CATALOG



The Canadian Fairbanks-Morse Company Limited
MONTREAL, CANADA

St. John, N.B. :: Toronto :: Winnipeg :: Saskatoon :: Vancouver :: Calgary

MERRELL
PIPE THREADING AND
CUTTING MACHINERY

No matter what your requirements for pipe-threading we build a machine to do the work easily, quickly and economically. All forms of Hand or Power, Stationary or Portable Engine or Motor Driven Pipe Threading Machinery.

THE MERRELL MFG. COMPANY

16 CURTIS ST. . . . TOLEDO, OHIO

Suppose You Are in Crowded Waters

And the other fellow's boat is right on you! You haven't room to turn—you haven't time to stop the engine and reverse! Then is the time you would be willing to pay tenfold for a

BALDRIDGE REVERSE GEAR

THE BALDRIDGE GEAR CO.

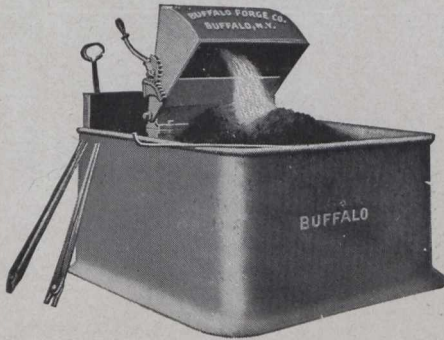
674 West Grand Boulevard Detroit, Mich.

Can be attached to any engine. Standard equipment with Canadian Fairbanks-Morse Co. engines. Immediate delivery from Montreal, Toronto, St. John, N.B., Winnipeg, Saskatoon, Calgary, Vancouver (Send for the book).

"THE GEAR TO
BEAR THE WEAR
AND TEAR."



In answering advertisements kindly mention "The Review"

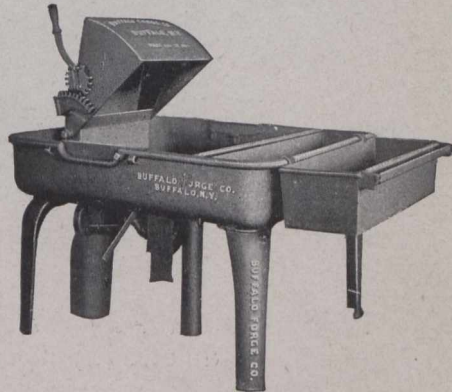


No. OD Forge

THE SMITH is only human; he may be used to dingy, smoky surroundings, but he will become a more efficient and contented workman when placed in a shop kept clean, bright and healthful with

BUFFALO "DOWN DRAFT" FORGES

THESE forges prevent smoke and gases from escaping into the shop, and do away with cumbersome overhead hoods and piping. They cost hardly any more than other forges and are infinitely better. We are originators and patentees of the only successful down draft system and supply 90% of the world's demand. All styles and sizes. Let us figure with you on a complete forge shop equipment.



No. OOSD Forge

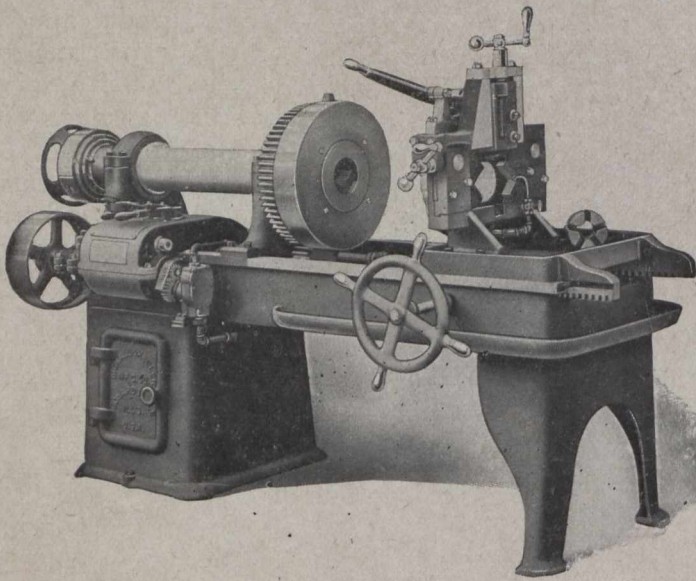
ASK FOR CATALOG 178-J-4.

The Canadian Buffalo Forge Co. Limited

ST. JOHN
TORONTO

MONTREAL, QUE.

WINNIPEG
VANCOUVER



*If It's a Pipe Machine You Need—Then
It's a "B. & K." You Ought To Have*

HERE are a few reasons—and you'll find more if you examine and compare these machines with others.

There's nothing radical in the design—nothing experimental. Not a single useless part. *The Gripping Jaws* hang on like a bulldog. *The Die Head* is ahead of all others.

LET US SEND A CATALOG.

Bignall & Keeler Mfg. Co.
EDWARDSVILLE, ILLINOIS, U.S.A.