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DETROIT, JANUARY 5, 1918



CURRENT COMMENT.

Seventy-five Years of Progress.

The passing of the year 1917 completes a period of seventy-five years since the Michigan Farmer was established in 1843. In this period, which marks little more than the allotted life of man, great changes have occurred in the agriculture of the state. The period has been one of progress, and particularly has the last twenty-five years of the period been an era of great and unprecedented agricultural progress.

As there have been great changes in agricultural practice during the three quarters of a century which has elapsed since the establishment of a trade journal for Michigan farmers, so has there been a great change in the standing accorded farming as a business and farmers as business men. Of all the remarkable developments of the past century, perhaps none is more remarkable than the agricultural development which has occurred in this country and indeed in this state during the past seventy-five years.

This progress has been due in large part to the character and sterling qualities of the men who have accomplished that development on the farms of Michigan, from the pioneers who blazed a trail into what was then a wilderness and started the work of reclamation and improvement to their descendants of the present day who have built well upon the foundation thus prepared for them. It has also been due in part to the development and application of science to agriculture through the work of the land grant colleges of which the Michigan Agricultural College was the first to be established in the United States. To a very great extent this progress has also been aided through the dissemination of practical and scientific information through the columns of that trade journal for Michigan farmers established away back in 1843, when the agriculture of the state was in its infancy. The present publishers of the Michigan Farmer are pardonably proud of the fact that the greatest progress in agriculture has occurred during the years in which it has been their privilege to contribute to that progress, with which they have ever striven to keep pace in the im-

provement of the paper from a practical and educational standpoint and as a wholesome factor in the development and entertainment of every member of every farm family in which it has been a weekly visitor for so many years.

Great as has been the agricultural development of the past seventy-five years, and particularly of the past quarter century, with the beginning of 1918 we stand at the threshold of still greater agricultural opportunities which carry with them greater responsibilities and greater obligations. Our country is engaged in the greatest of world wars, admittedly as the saving factor in insuring the perpetuation of lasting national if not personal liberty, and in establishing a just and lasting peace. In accomplishing this end, it has been clearly and repeatedly stated by government officials from the President down, that the final issue depends largely upon the patriotism and ability of American farmers in increasing production of food stuffs under the inevitable handicaps incident to a state of war to an extent which shall provide ample means not only for the support of our armies and our civilian population, but as well for the support of the allies and the civilian population of our allies at the front where war conditions and war handicaps are so much greater than those which obtain here as to be beyond our realization.

That the nation's dependence upon the farmers of the country, and especially upon the farmers of Michigan will not be in vain we are assured. That this publication will ever strive to aid in the solution of the many vexed problems now confronting the farmers of Michigan and to lighten by every possible means the added burden which Michigan farmers are called upon to bear we gladly pledge. That the next quarter century will mark still greater progress in our agriculture than the seventy-five years which have preceded it we fully believe. May this be the silver lining to the dark and foreboding war cloud which now hangs over the nation in common with other of the world's most progressive peoples. Let us all work together toward that end.

Business and the War.

The inevitable effect of war upon the business of the country is exemplified in the assuming of direct control and operation of the railroads by the government. Under ordinary conditions such a move, even if deemed advisable by government officials and backed by strong public sentiment, would have involved months if not years of discussion and bickering. But under war conditions, when the necessity had become apparent, this move was accomplished quickly without any noticeable interruption of business and almost without friction. Leading railway executives recognized the necessities of the situation and pledged their aid in the successful accomplishment of government operation. The few dissenters will quickly fall in line or be relieved of responsibility in the matter.

As a war measure government operation of our railroads seems assured of success. Other government functions, as food control and fuel administration are being generally received by our people in a spirit of helpful cooperation. The war has made them necessary, and a long duration of the war may make it equally necessary to broaden their scope and institute government control along other lines.

In organizing large undertakings of this kind, some mistakes are certain to be made, just as mistakes have been made in the hasty preparations for war. These mistakes should not, however, be made the subject of destructive criticism. Constructive criticism is always helpful, but its antithesis has no proper place under war conditions. The war slogan, "Business as usual," is good in so far as it may not inter-

fere with preparations for, and the prosecution of the war. A minimum disturbance of industrial conditions is most desirable, but none of us should lose sight of the fact that the main business, not only of the government itself, but of every citizen of the United States, should be the winning of the war, or cooperation toward that end.

Thoughtful men who have had the broadest opportunity to acquaint themselves with the incidents leading up to the war and marking its progress, are free in the expression of the opinion that we must not only win this war to make the world safe for democracy, but to make America safe for Americans. To this end we should prepare to cheerfully endure any business handicap and any personal hardship which may be essential to the prosecution of the war to an early and successful termination.

In this issue will be found a number of articles relating to the economy of the use of tractors on Michigan farms and the economic operation of tractors where they have been made a part of the farm equipment. The development of the tractor in recent years has been almost as rapid as has the development of the automobile and the auto truck. A single decade ago the automobile was considered a plaything—a mere luxury; today it is an acknowledged necessary factor in transportation. Even five years ago the auto truck was known more widely by its limitations than its business efficiency in the solution of heavier transportation problems; today it is one of the most vital factors in the conduct of the world's greatest war, and an acknowledged necessity in the maintenance of our commerce.

So with the tractor; only a few years since it was thought to be useful only on the great farms of the western plains where large units of power could be successfully used in the operation of large equipment over wide areas within the limits of a single farm. The modern development of the tractor has, however, shown the error of this idea, as the modern development of the automobile and auto truck have shown the error of public opinion with regard to their business utility. Smaller power units have been found more adaptable to average conditions, and instead of the great heavy, cumbersome machines of a few years ago, tractor manufacturers are now making lighter models adapted to average sized farms and the various kinds of work which require drawbar or belt power on those farms.

Something of the experience of our Michigan tractor users will be found in the special data published on pages twenty and twenty-one of this issue. This data was gathered last season by our Research Department, and will prove of great value to our readers who are interested in the tractor proposition. Without doubt, the tractor can be made to materially aid in the solution of the vexed labor problem upon many Michigan farms. It is for this reason that special emphasis has been placed upon tractor economy—particularly economy of operation—in this issue. The possibilities of tractor farming should not be overlooked by any farmer who could make such an implement help to solve his labor problem next year.

More Sheep for Michigan.

Readers of the Michigan Farmer who have followed the reports of the meetings which have been held and the plans which have been made for the development of a sheep grazing business in the undeveloped sections of the state will be interested in future plans looking toward that end. Plans have been made for the attendance of a Michigan delegation at the National Wool Growers' Convention at Salt Lake City, for the purpose of bringing to the attention of western sheep men something of the

possibilities of Northern Michigan as a sheep grazing section and the plans which have been adapted to encourage the industry.

The present is a most propitious time for the encouragement of sheep production on a large scale on our undeveloped or partially developed lands. The country needs the meat and wool, the sheep grazers who are being crowded out of the west by the operation of the homestead laws need new ranges and Michigan feeders need new sources of supply of feeder sheep and lambs.

More sheep for Michigan is a slogan which spells increased prosperity for the state if its accomplishment can be realized.

HAPPENINGS OF THE WEEK.

Foreign.

The European War.—On the west the Germans attacked on a two mile front south of Cambrai on Sunday. While the general attack was unsuccessful they succeeded in gaining entrance to two small English salients. From one of these they have been practically ejected while fighting continues at the other.—The Teutons continue to batter the Italian lines but with little success. While every effort is being made to force the defenders back to the Addige river, the Italians are growing more and more hopeful of their ability to withstand the tremendous pressure of the Teutonic front. The fighting is confined largely to artillery operations.—In Palestine and Mesopotamia the British are meeting with continued success—both armies are gradually taking territory from the Turks and now the probability of the army coming up the Euphrates and the other which recently captured Jerusalem and this week advanced several miles toward Damascus, will later join farther to the north. This meeting will be opposed by the Turks under the German leadership of General von Falkenhayn, who no doubt proposes to defeat one army before the other arrives. He is now at Aleppo.—In Russia political affairs are in a chaotic state. The peace conference with the central powers is in session. Lenin, the Bolshevik minister of foreign affairs, is endeavoring to get the entente allies to join in the negotiations. This Great Britain, France and the United States have refused to do at the present time. Our Ambassador to Russia has been charged with assisting Gen. Kaledine, the Cossack leader, with Red Cross money, which charge has been indignantly denied. Last week a Russian ship arrived in an American Pacific port with ammunition and arms to foment disturbances in this country through the aid of I. W. W. men. Revolutionists have blown up one of the Kronstadt forts near Petrograd and during the past week heavy fighting has been in progress around Irkutsk between the Cossacks and Bolshevik forces.—The Roumanian king is reported to have abdicated in favor of his oldest son. The country still supports the allied cause.

A large part of the shipping of Holland is being placed at the disposal of the United States in exchange for food from this country.

Three British destroyers were sunk in Dutch waters by running into a mine field. One hundred and ninety-three persons are reported lost.

Guatemala City, capital of Guatemala, has been largely destroyed by an earthquake. Practically all public buildings have been leveled. Many persons were killed in their homes and others in the streets. More than 80,000 are said to be rendered homeless by the disaster. Martial law has been declared.

National.

Twenty-three American flyers who have won renown in the French service, have joined General Pershing's army in France.

Higher wages has resulted in an increase of coal production for 1917 of from 12 to 18 per cent despite a 25 to 30 per cent shortage of labor.

An incendiary fire destroyed the conveyor to the big union elevator at Detroit where 1,000,000 bushels of grain are stored.

The federal government has requisitioned the electric power produced at Niagara Falls to insure an adequate supply of power for munition manufacture in that district.

Last week the United States government took over the railroads of the country to operate them as one large system. Failure of the several managements to move traffic in an economic manner led the government to the drastic action. Already a freer movement of goods is reported.

Proper Tractor Lubrication Is Important

By PAUL FRANCIS IRVING

MESSRS B. and F., North Dakota farmers, formerly used a lubricating oil costing thirty-eight cents a gallon in their 30-60 horsepower tractor. But in field tests, using another oil which cost nearly twice as much per gallon, they found to their astonishment, that the use of the more expensive oil resulted in a fuel saving of twenty per cent and an oil saving of 62.5 per cent, which means a big money saving per acre. Mr. I., a Kansas farmer, also made some lubrication tests, substituting an oil somewhat higher in price than he formerly used, and found that he was able to make a fuel saving of 19.4 per cent and an oil saving of 54.3 per cent. Again, the higher priced oil more than justified its cost. Mr. G., another North Dakota farmer, formerly paid forty-two cents a gallon for the oil he used in his tractor. Now he saves money by paying more for a different grade of oil. Why? Comparative tests showed him a sixty per cent reduction in oil consumption when using the more expensive grade.

What do the experiences of these tractor owners mean? Simply this; that correct lubrication brings a cash dividend on every acre. That lubricating efficiency means lower costs per acre and per year in operating expense. These cases are typical. Hundreds of tractor owners throughout the United States have had similar experiences. What makes these economies possible? Here are some of the reasons:

Body and Quality.

The problem of minimizing friction in tractor operation is even more difficult than that of correctly lubricating an automobile. Automobiles are much higher powered, relative to the weight and work performed. An automobile engine is seldom called upon to work at full capacity, while tractor engines are required to work continually at from seventy to eighty per cent of their rated load. Tractor engines are subjected to rough usage and great strain, due to the character of the ground over which they must travel, and in some cases to the absence of springs. Slower traveling speed is therefore necessary in order to reduce vibration. Due to the slow speed at which it travels, the tractor does not have the benefit of the additional cooling value of air circulation, which is produced by a fast moving automobile.

All these facts point to one conclusion: That the tractor is a heavy, hard-working, slow-moving machine. It tends to run hot and demands a lubricant rich in quality to enable it to stand up under excessive heat. The oil must be correct in body for the engine in which it is to be used. All oil is worthless unless it has the correct body to reach all bearing surfaces, and is rich enough to supply these surfaces with a protecting film.

When you realize that a film of oil rarely more than 3-1000 of an inch in thickness—about the thickness of a sheet of paper—furnished your protection against the ravages of friction, you will appreciate how vital the correct lubricant is to the efficient operation of your engine. Without that film of oil between pistons and cylinder walls the pistons would bind and seize in a short time. With an oil of poor quality, you invite the penalty of scored cylinder walls, scored pistons and broken piston rings. If the body of the oil is incorrect, the same results may follow, even if the quality of the oil be of the best. You have a right to expect that the oil you use will meet both in quality and body, the conditions which must be met inside the cylinders of your engine.

Cylinder Temperatures.

Consider the question of cylinder temperatures. You cannot picture 2,500 to 3,000 degrees Fahrenheit—the approximate temperature at the point

of explosion. If that heat were permitted to continue unchecked, the cylinders would soon be a mass of molten metal. The cooling system and lubricating system of your engine are the chief elements in protecting it against excessive heat. But the destructive heat of friction must also be overcome. This task falls to the lubricant. If the oil breaks down under heat, it loses much or all of its lubricating property and fails to separate the moving metal surfaces. Destructive friction follows, and that friction produces additional heat, thus increasing the cylinder temperature.

Upon the lubricant falls the additional task of sealing the spaces between pistons, piston rings and cylinder walls. In performing this function a portion of the oil is directly subjected to high temperatures. If the oil fails to stand up under this heat, not only is the lubricating film destroyed but compression is weakened. Gas escapes past the piston rings. The force of the explosion is reduced. Loss of power and waste of oil and fuel result. You have a right to expect that the oil you use will withstand the heat of service, prevent undue frictional heat and give you full compression and power.

Bearing Lubrication.

By rubbing two pieces of wood together you can make fire. It is not

mospheric temperatures, the cold test qualities of the lubricant must be taken into account. The oil you use should be adapted to the lubricating system of your tractor.

The construction of the engine: horizontal, vertical or V-type cylinder arrangement; two or four-stroke cycle; bore and stroke; valve construction, size and location; number and fit of piston rings; piston design and composition; piston clearance; water cooling system (pump or thermo-siphon); engine speed and climatic conditions—all must be considered. For best results, the oil you use must meet these conditions with scientific exactness.

The determination, then, of the correct oil for any tractor requires highly technical knowledge of lubricants and their properties, and an exhaustive knowledge of gas engine construction and operation, combined with broad practical experience. Such knowledge and experience the tractor owner cannot be expected to have. How, then, can the tractor owner meet the lubrication problem his machine presents? Here is the answer.

When you buy oil, make the dealer or salesman show you the recommendation of a reliable lubricant manufacturer that the grade of oil the manufacturer recommends meets the lubricating requirements of your type of

Be guided by service rather than market price. Pennies saved in buying lubricating oil are danger pennies. They jeopardize your tractor dollars. They lead to heavy fuel bills, premature engine wear with its attendant repairs and loss of time and money. The difference in cost between the poorest lubricating oil and the best lubricating oil is small. Is that small first saving worth while? It can easily mean the difference between a smoothly-running tractor season and a season free from repairs, instead of overhauling and replacing of broken parts. If you start the season with wrong-bodied oil, or poor quality oil, you are likely to finish it with your tractor in the repair shop. A single year's use may see your tractor seriously reduced in value—reduced in working efficiency—reduced in serviceability.

ECONOMY OF THE FARM TRACTOR.

To what extent does the tractor displace horse power and is it cheaper, were the questions debated before using a tractor. The answer is not in the terms of the questions as asked, but rather how much additional work did the tractor enable one to do at the time it had to be done. In the days that are long since past when the day hand was always available, special work as well as additional regular farm work could be undertaken because this day help was a labor reservoir to be drawn on, and when not employed entailed no expense. In a similar way the tractor is the available surplus reserve power to put in a large area of crop in a short time.

Reserve Power is Often a Great Asset.

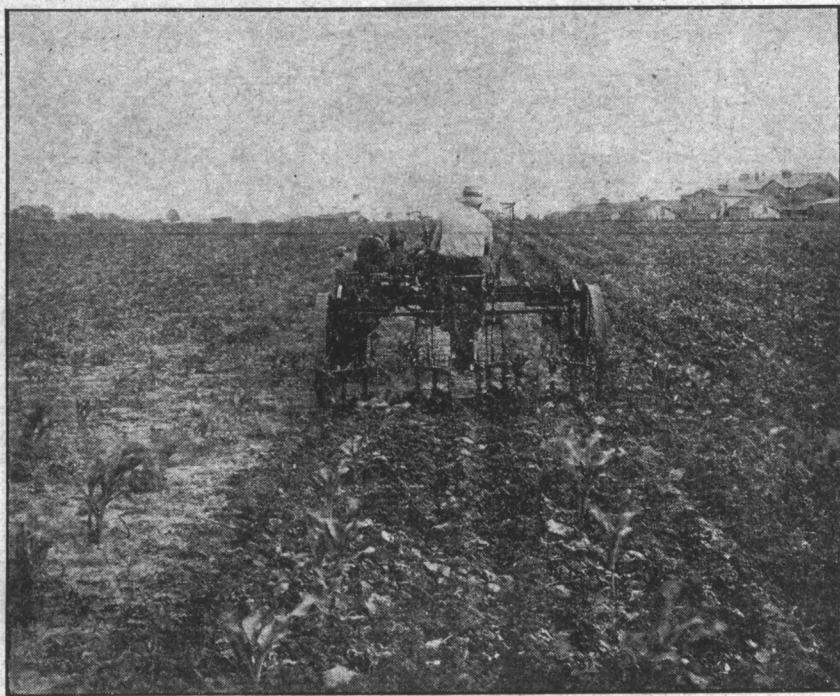
In the spring of 1917 wet weather reduced the efficiency of equipment fifty per cent in the sense that when men and teams could have done the work, the ground was too wet, and when it was possible to do the work the tractor, which involved no expense when idle, was the reserve power that restored the possibility of accomplishment or the acreage would have been diminished. When the ground was excessively dry this last summer and wheat ground difficult to prepare it was the tractor that plowed and also drew heavy pulverizing implements and fitted the land so it was possible to utilize the light rainfall to secure germination which otherwise would have been impossible. The tractor as a reserve power and to take the hard tugging drudgery off horse flesh is well worthy of a place on adequate sized Michigan farms. The use of a tractor for the past two seasons has probably paid its entire cost in putting in the acres that otherwise would not have been planted on my farm.

The Tractor is Crop Insurance.

The first sixty days of spring crop work in Michigan is largely a determining factor of what the harvest will be. Horses are not hardened to labor and are easily overheated and overworked in the anxiety of crop planting. The disabling of one horse cripples the team of two or more horses. The tractor is the crop insurance in the sense of ability to plant, and in emergencies it is available for twenty-four hours a day. Under favorable conditions a boy can "work in" on the tractor and the whole of daylight is utilized, which is impossible with horses.

Other Important Economies.

There is also use for the tractor on the belt in sawing wood, filling silos, shedding corn fodder, etc., which make it a farm necessity. The tractor is not displacing horses to anything like the extent anticipated, but rather supplementing horse power. There was and is more use for power on the farm than had been recognized and the tractor fits into this demand, not only



Tractors Are Constantly Being Adapted to a Wider Range of Farm Work.

hard to imagine the heat that would be generated by metal-to-metal contact of the crank shaft and bearings when the former is revolving at the rate of, say, 900 to 1,250 or more revolutions per minute. Bearings differ widely in shape and size and are lubricated by different methods, according to the oil system employed in the engine. The use of an oil of poor quality or incorrect body may result in worn main or connecting rod bearings, piston pins, crank shaft or crank pins. You have a right to expect that the oil you use will amply protect all these bearing surfaces against ruthless wear.

Determining Grade of Oil.

What is the lubricating system employed on your tractor? Engineers have classified these systems under five main heads. You should use an oil that is suited to the system employed. Suppose, for example, your tractor has full force feed lubrication. Here the oil is supplied by direct pressure to the main frictional points, including wrist pins. Such a system permits the use of a relatively heavier oil, rich in lubricating quality. Again, if your tractor has a lubricating system in which the oil pipes are exposed to at-

tractor machine with scientific exactness. And be sure of the manufacturer's standing in the lubrication field. Be sure that he is qualified to make an authoritative recommendation. Have it proved to your complete satisfaction by actual demonstration, if you will, that this oil will give maximum lubricating efficiency and lowest maintenance cost.

Follow the Manufacturer's Advice.

Don't be misled by oil tests. An actual service test with the oil being used in the crank-case of your tractor, or other tractors of similar make and model, is the safest guide to correct lubrication. In many instances it will be found that the tractor manufacturer either in his instruction book, or by means of a plate attached to the engine recommends the use of a certain brand and grade oil. In such instances it is advisable to follow the tractor manufacturer's advice. The tractor manufacturer wants his machines to make good. He wants you to get the maximum of economical service from them. He realizes the vital importance of correct lubrication. Hence the recommendation plates and the suggestions in the instruction book.

because of the need but because the value of the acre used for horse feed and converted into horse power is more valuable for other purposes and kerosene applied to this work is cheaper than farm feeds, used to reduce more food stuffs, and is applied only at the time power is used.

On many western ranches horses do rather light work on no grain with the heavy work done by tractors. Horses can be fed less of expensive grain, which leaves more acreage to be devoted to crops for human food. This is very strongly noted in England where land and labor are both scarce, and the farm tractor even with high cost of motor spirit, is found to be economical. The tractor carries with it other essentials of farm improvement, viz., well-shaped fields, tile drains and the necessity of removing stones or other obstructions. The farm tractor has come to stay and its worth is conceded by those who have tried it.

Shiawassee Co. JAS. N. McBRIDE.

KEEP SOFT CORN FROM SPOILING.

The insufficiently cured corn crops of 1915 and 1917 have caused some farmers, particularly those around Prophetstown, Illinois, to apply eight to ten quarts of salt to each wagon load of corn as it is being cribbed. They report that the salted corn keeps well, while similar corn without salt spoils. They report that the salt draws water from the ears and prevents heating, souring or rotting where there is sufficient ventilation to carry away the moisture.

Although observations and investigation along this line by the Office of Corn Investigations, United States Department of Agriculture, have not progressed far enough to give definite results, means of saving mature corn of unusually high moisture content are so urgent and tests of the preserving power of salt are so promising of economic results as to warrant a trial by farmers who find it advisable or necessary to crib corn containing twenty-five per cent or more of moisture. The cost of the salt will be less than one cent per bushel of corn. Even with the aid of salt, good ventilation is necessary.

CALL GRAIN GROWERS TO MEETING.

A clarion call to grain growers to sit in at the sessions of the Michigan Crop Improvement Association on January 15-16 has been issued by this organization. This meeting, while it will be the annual convention of the association, will start the mobilization of the grain growing forces of the state for the job of filling the national flour barrel and keeping Uncle Sam's larder stocked in 1918.

Of course, many are asking themselves, "What has the Michigan Crop Improvement Association to do with all this?" In other words, there is a question as to whether the association is somebody or nobody. But no concern need be indulged in on this score, for the Crop Improvement Association, by way of shedding light upon its credentials, is the organization of live Michigan farmers that within the past three or four years has done so much to secure the wider use in Michigan of pure-bred and pedigreed grains.

The item of chief interest about the association's activities now is that it will convene at the college on January 15-16 for a series of meetings to which every grain grower in the state is invited. These sessions will be taken up with the consideration of questions closely touching the interests of grain growers throughout the state.

And like the pure-bred grains the association has been endeavoring to bring to the attention of Michigan farmers, the program will be usual. There will, of course, be the usual run of speeches, business meetings and committee conferences to begin with, but "over and

above these," as the rule books would put it, there will be a flavoring also of "something different."

One of these details will be a meatless banquet of pure-bred grains, with chicken, not so meatless, on the side. The menu, as an example in point, will show Red Rock wheat rolls, Rosen rye buns, Pickett corn bread, Boston baked robust beans, Plymouth Rock chicken, and other pedigreed delights of the kitchen in liberal variety.

Another part of the two days' program will consist of a show of pedigreed grains in which any grain grower in the state with pedigreed grain, grown by himself, in his possession, will be privileged to enter exhibits. Prizes will be awarded for corn, wheat, rye, oats and barley, threshed and in the sheaf, and alfalfa, grasses and beans. Also there will be a miscellaneous class for any variety of buckwheat, alfalfa seed, medium or mammoth clover seed, alsike clover seed, local association exhibits, short course corn exhibits, short course small grain exhibits, and county improved grain exhibits. While a large number of entries have already been filed with the association, the lists will be held open until the day of the convention. Persons desiring to get in on the show, it has accordingly been given out, can do so by communicating with J. W. Nicolson, in East Lansing.

Some of the men who will address the convention during its sessions will

of material should be as follows: One part cement; two parts sand; one-fifth part hydrated lime plaster.

The cement, of course, should be of good quality and the sand should be clean, and sharp and of a size of pebbles that will pass through a screen of one-quarter-inch mesh. Cement gives strength and body to the mortar and the lime paste which is added gives smoothness so that it can be worked under the trowel. If lime paste is not used the mortar will be "short" or crumbly under the trowel.

Hydrated lime should give good results for this kind of work. The cement and hydrated lime, after being thoroughly mixed dry to a uniform color are added to the dry sand and the whole manipulated until evenly mixed. Add water to secure proper working consistency. This mortar should be thoroughly worked over until perfectly homogenous. Only mix up as much of this composition as can be immediately applied and never use any mixture that has been standing for over thirty minutes.

H. H. MUSSELMAN,
Farm Mechanics Dept., M. A. C.

ASK FOOD CHIEF TO CONSERVE MICHIGAN POTATOES.

Michigan's county agricultural agents and extension men, who are credited with knowing more of the "inside" facts about agricultural conditions than

way, especially, if possible, by requisitioning large quantities of wheat, and exercise authority over the transportation companies to see that the potato crop is moved in a satisfactory and efficient manner."

This was signed by a committee of agents.

GROW ROUND TYPE POTATOES.

I think the farmer is getting an unfair deal in the potato grading rules, and if this keeps up I am through raising potatoes for market. I took a load the other day, hauled them ten miles, had forty-five bushels on the load, of the American Wonder, a long variety, and they graded out eleven bushels out of the forty-five, after I had graded them in the field. This means about one-fourth of my crop, and there is no sale at present for the small ones; and hauling them ten miles to be graded out, and hauled back is no small item. I brought back potatoes $3\frac{1}{2} \times 1\frac{1}{2}$ inches in size. Now, anybody that can't peel potatoes this size ought not to have any.

Emmet Co.

C. K.

In reply to the above letter, will say that in sections of the country where practically all of the potatoes grown are of the long type, a smaller screen is used than the one used for the round type. However, in the state of Michigan there are so few of the long type grown that the men who persist in planting this type against the recommendation of those who have been trying to encourage the growing of the round type only, will be obliged to suffer the loss which will naturally come to them as a result of not conforming to the general plan as recommended by the most progressive potato growers.

The statement that there is practically no market for the number two grade at the present time is accounted for because of the slowness in the movement of No. 1 stock. The demand even for the best potatoes for the last six weeks has been very dull and it is not strange that the No. 2 stock has not been bought up freely. It is the intention, however, of this grading law that the No. 2 reach the consumer and, of course, be sold by the growers. This is a matter which will be governed by market conditions and which is beyond the control of those who have the grading in charge.

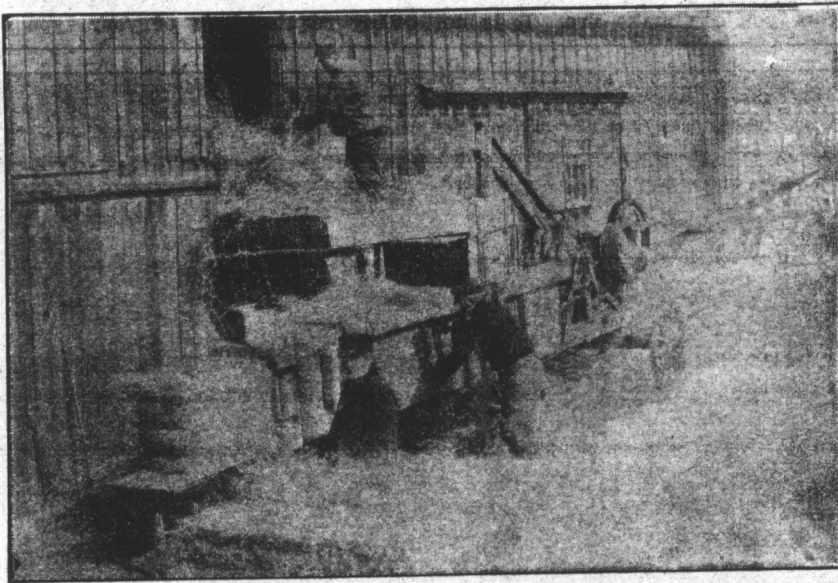
C. W. WAID,
State Potato Specialist.

THINNING IMPROVES MICHIGAN WOODLOTS.

Scientific and practical proof of the fact that owners of woodlots in Michigan can much increase the rate of timber production in these reservations by proper thinning methods has been secured by the department of forestry of the Michigan Agricultural College. The college foresters, who for a number of years have been recording the rate of growth in woodlots where thinning is done, and in other woodlots where no thinning has been practiced, have found that the former grow almost twice as rapidly as the latter.

"Before thinning was made," the department declares, "the woodlots were growing only at the rate of about three per cent, or were producing, in other words, about one cord of wood per acre per year. But since thinning was commenced they are increasing at the rate of seven and one-half per cent, and are producing one and eight-tenths cords of wood per acre per year."

"The cords referred to are standard cords, four feet high, eight feet long, and four feet wide. In most woodlots the annual growth of wood may safely be cut each year. Michigan has a total area in farm woodlots of over 2,000,000 acres. The amount of cord wood that could be cut from them each year in their present condition, if only the annual growth were cut, would probably be about 1,000,000 cords. By proper care these woodlots should produce a total of about 3,000,000 cords of wood per year."



Tractor Power is Often Useful on Any Farm

be C. P. Bull, noted throughout the northwest as professor of farm crops for the University of Minnesota, and secretary of the Minnesota Farm Crops Improvement Association; Hon. I. R. Waterbury, editor of the Michigan Farmer and member of the State Board of Agriculture; Dean Alfred Vivian, of the Department of Agriculture of Ohio State University, and R. S. Shaw, dean of agriculture at M. A. C.

But the thing the association is aiming to most force home in its invitation, is that sessions will be open to every grain grower in the state during the entire two days of the meeting.

As an "aside," the Michigan Improved Live Stock Breeders' and Feeders' Association will convene at the college on January 16-17 to take up the important live stock issues of the day.

CEMENT PLASTER FOR MASONRY.

What is the right way to mix the ingredients to make mortar for a stone wall? I don't mean concrete. Quicklime seems to be unobtainable, and hydrated lime they say is not as strong. Now, what ingredients, and how much of each, should be used to make mortar suitable to lay a stone wall?

Lenawee Co.

O. O'H.

For masonry work the use of cement plaster instead of lime plaster is becoming more general. Cement gives greater strength and durability and when properly made up works quite readily under the trowel.

For cement plaster the proportions

any other group of men within the state, have joined in petitioning George A. Prescott, the state food dictator, to find outlets for Michigan's big potato crop. The agents suggest that this might be done by immediate use of all drying facilities to take care of the excess crop, and more thorough education of the people in appreciation of the food value of the potato and the many domestic uses to which it can be put.

In presenting the case of the potato to the food administrator the agents, speaking through the Michigan Agricultural College, said:

"In view of the fact that there are at present millions of bushels of potatoes in the country with little immediate prospect of marketing the bulk of them at compensating prices to the growers, and the danger of these potatoes going to waste, with the serious and inevitable result of discouraging the producers to put forth an effort to increase the food supply of the nation the coming year, this committee, representing the county agricultural agents of the potato growing sections of the state of Michigan, respectfully recommend to the food administration that the drying facilities of the country be immediately utilized to their full capacity for the purpose of condensing the potato product, and that the administration guarantee a suitable market for it. Further, that the administration force the use of potatoes in every

So rapidly has the tractor become a necessary part of farming equipment that it needs no introduction here. It is a more satisfactory source of power than the horse because as a rule, it delivers this power at a much lower cost while doing work and when not at work does not cost a cent. Furthermore, because it combines a greater amount of power into a single compact unit in the control of one man, it solves to a great extent the hired-help problem if combinations of farm machines are made to utilize this power to the best advantage.

Farm machinery of today has been designed for the use of horses, so what is presented here is meant to be a suggestion to the individual tractor owner to help him work out his hitch problems with a greater degree of success. In many cases, hitches along the lines suggested here can be made by the farmer, if he will take time to study carefully his own requirements.

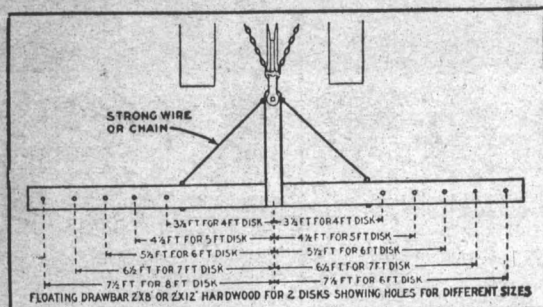


Fig. 1.—A General Purpose Hitch.

Many Machines Need no Special Hitch.

A number of the machines now used on the farm with horses can be used to advantage behind the tractor without requiring a specially designed hitch. Plow manufacturers take care of the equipment necessary to attach plows, and for the ordinary types of drag harrows the drawbar which comes regularly with such a harrow is all that is necessary, except when an unusually large number of harrow sections are used as one harrow.

Tractor disks and tandem disk harrows also require no special hitch. The only point to be taken into consideration here is that a tandem disk harrow equipped with a forecarriage should have a flexible connection long enough to permit the tractor to drop down into a depression without throwing this added weight upon the forecarriage of the disk harrow. Forecarriages are really unnecessary with tractors. Likewise no special hitch other than a stub tongue is necessary for a single binder, manure spreader or wagon, or a single wagon and hay loaded combined. When more than a single unit of these various types of implements is to be used behind a single tractor, some special hitch is necessary.

A General Utility Drawbar.

Every owner of a farm tractor will need some sort of a general purpose drawbar so he can attach various machines to the tractor. Such a drawbar should be as simple as possible and yet meet practically all the requirements of the different farm machines. A suggestion for such a hitch is shown in Diagram 1. To show the adaptability

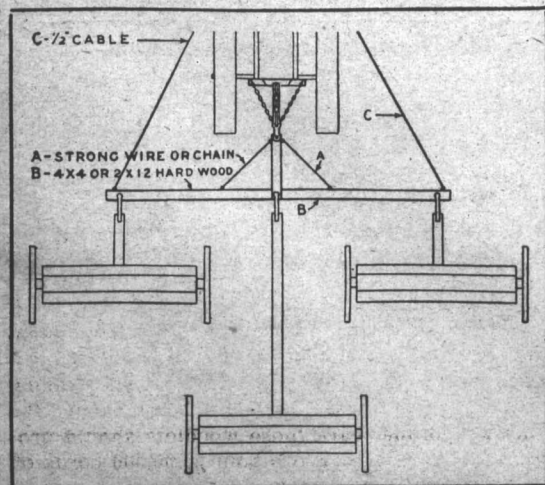


Fig. 3.—Floating Drawbar Hitch for Three Harrows

Tractor Hitches

By H. L. GADDIS

of this simple supplementary drawbar, the holes indicated in this diagram are for attaching different sizes of disk harrows, allowing for the proper overlap of six inches which is necessary for disk harrows when drawn in this manner.

Materials and Construction.

For the construction of such a hitch, select a good piece of hardwood of a size that will stand the total amount of strain coming from the different combinations of machines that are to be attached behind it. Usually a 2x8, 2x12, or 4x4 piece would be strong enough for the purpose. The length depends upon the number of machines which the farmer wishes at any time to combine, depending also, of course, upon the capacity of the tractor.

The stub pole shown in Diagram 1 can be of the same material and should be from three to four feet long, bolted securely to the drawbar and braced by means of angle irons or heavy cables against side strains. These braces should not extend too far out along the drawbar, as on short turns they might interfere with the tractor drive wheels. The end of this tongue should have a strap iron reinforcement, and a hole bored for coupling it to the tractor by means of a clevis. Other long clevises should be provided to attach the different machines to this drawbar.

Now when a supplementary drawbar is made on this order, it would be well to place a forecarriage or tongue truck beneath this stub tongue to pre-

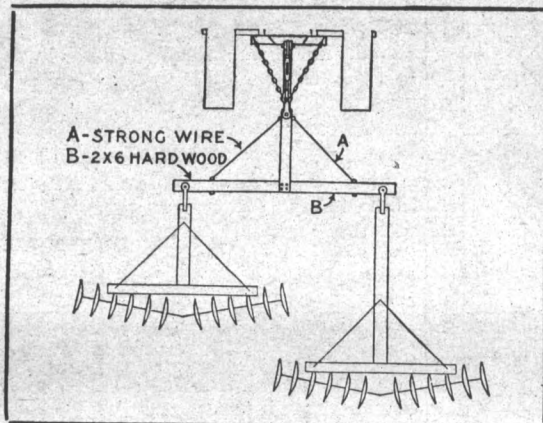


Fig. 2.—Hitch for Two-Disk Harrow.

vent seesawing of the machines attached to it. Also, for special purposes such as loading hay with two wagons and loaders at one time, caster wheels placed beneath each end of the drawbar, or ordinary low wheels, with stub axle bolted to each end, will be found an advantage, as they will support the poles of the wagons and prevent them from running foul with the ground.

A Hitch for Two Disk Harrows.

Diagram 2 shows the general purpose hitch used with two disk harrows. In order to have the harrows overlap for good work, it is necessary that the pole of one harrow be longer than the one on the other, making it possible to disk all of the ground. Providing the tractor has the power, an excellent combination can be made for conserving moisture by simply attaching sections of the smoothing harrow behind the disk harrows. This can be done by connecting the smoothing harrow drawbar to the frames of the disk harrows in front or if it seems preferable by running a connec-

tion ahead to the main tractor drawbar.

For Three Disk Harrows or Drills.

Where a tractor has power to pull three machines of a kind and there is need for doing the work in a hurry, Diagram 3 illustrates how such a combination may be made. It will be noted from the diagram that the middle machine has a longer pole than the two at the ends; by this arrangement the outfit can be turned to better advantage. A forecarriage beneath the stub pole would be an advantage to prevent seesawing. (See illustration).

When Two Hayloaders Are Used.

The steady power of a tractor is a decided advantage for loading hay on level ground. The supplementary drawbar that is shown in Diagram 1 is easily adapted to this purpose.

The relative positions of the wagon poles on the drawbar are governed by the regulation width of the windrows. (See Diagram 4). It will be found an advantage here to have the ends of the drawbar supported by caster wheels, or wheels with stub axles. These keep the drawbar and wagon poles off ground. It must be remembered that such a hitch offers no means of holding the wagons back on a hillside, except by the friction of the rake teeth of the loaders. (See illustration 3).

With Plows and Peg or Disk Harrow.

Such a combination as shown in Diagram 5 does effective work as the harrow pulverizes the moist earth, preventing loss of moisture. The construction is simple. The 2x4 hardwood piece B is attached to the plow beams at C by means of U-bolts with the supplementary drawbar extending over the furrow just turned. At the outer end of this drawbar holes can be bored to allow for adjustments in the position of the harrow. The cable A connects the outer end of this drawbar to the front end of the plow beams. This serves as a support against the weight of the disk or peg harrow. (See illustration 4).

Offset Hitch for Road Grader.

Where an offset hitch is not supplied with the grader, Diagram 7 shows how a simple offset hitch can be made, which will allow the tractor to keep near the center of the grade where better traction is obtained while the grader can be working in the ditch. To construct this hitch, a strong 2x6 of hardwood about four feet long can be used. The ends of this are connected to the grader axle by means of stay chains. A draw chain extends from one end of the new evenner to the tractor and this chain should be only a few inches longer than the grader pole. The width of the offset is controlled by the grader operator by means of a block and tackle connection between the end of the pole and the drawbar chain. By reversing the connections, this offset can be made for either

side of the tractor as may be desired.

For Two or More Mowers.

Diagram 6 shows the outlines of a manufactured hitch for attaching two or more mowers behind a tractor. The first mower is connected directly to the tractor drawbar by means of a stub pole. The first mower requires no operator, for the operator of the tractor can raise and lower the cutter bar when necessary. The second mower is attached to the first by means of a bracket clamped to the axle of the first mower. From this bracket a flexible, adjustable tongue connection, marked A in the diagram, connects to

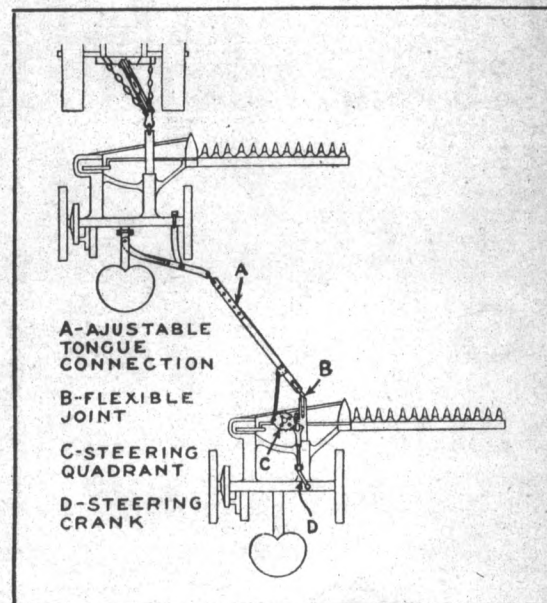


Fig. 6.—Special Mower Hitch.

the second mower. This tongue is adjustable to accommodate different width mower cutter bars.

The attachment for the third mower corresponds to the attachment for the second. The proper width of cut is maintained by means of a crank and quadrant attached to the stub pole and flexible pole of the trailing mower. A series of mowers connected in this manner cannot, of course, be expected to turn a sharp corner. For a "non-stop run," the field should be laid out with rounding corners.

Trailer Hitch for Grain Binders.

With a trailer hitch the grain farmer can operate as many binders behind his tractor as the tractor has the power to pull. Various types of hitches have been designed to meet the requirements of the different lines of harvesting machines on the market.

The first binder is connected directly to the tractor drawbar by means of a stub pole. The poles on the trailing binders are pivoted to a rigid frame and controlled from the seat by a gear quadrant and pinion with a crank.

This system of control enables the operators of the trailing binders to swing the platforms of their machines through a wide radius to or from the grain. Such a hitch can be attached

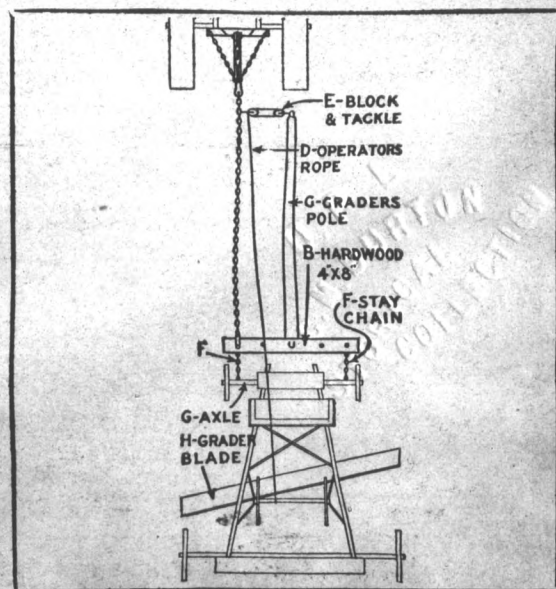


Fig. 7.—Hitch for Road Grader.



A New Idea in a Small Tractor Plow Outfit

You can now get a small Avery 5-10 h.p. Tractor with a special hitch and lifting device and use your old horse plow.

Attach your plow to the drawbar and connect the lifting chain and you have a complete tractor plow outfit. If you have hilly ground and want to use both right and left hand plows, attach them as shown here. You can raise and lower the plow without getting off the tractor. With the plow raised you can back up in short spaces easier than with horses.

This tractor is just the size for doing all the work on small farms or for light work on larger farms. The price is the lowest of any tractor built.

There is a size Avery Tractor to fit every size farm. Six sizes in all—from this small 5-10 h.p. up to a large 40-50 h.p. There is also an Avery Tractor Plow in light and heavy styles to fit every size tractor.

Motorize all your farm work with an Avery Tractor and Motor Cultivator

Do your cultivating with motor power. The Avery Two-Row Motor Cultivator makes it possible for one man to tend 100 acres of corn. It will also cultivate cotton and other row crops. By getting a special planter attachment you can plant your crops with the same machine. You can use it too for many other kinds of light field and belt work.

Only with modern Motor Farming Machinery is it possible for you to raise the largest crops and to save them after you

raise them. Here is an ideal Motor Farming Equipment—an Avery Tractor and Plow to prepare your seed bed and plant and harvest grain crops—an Avery Two-Row Motor Cultivator to plant and cultivate your row crops—and an Avery Thresher to thresh your grain crops.

The AVERY is the most complete and up-to-date line of Motor Farming Machinery built. Write today for complete catalog and ask for special information about the machinery you are particularly interested in.

AVERY COMPANY, 6227 Iowa Street, Peoria, Illinois
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Haul A Load Each Way

Crops must be hauled to town, and fertilizer must be hauled home.

Why Not Combine the Trips?

When you take a load to town
Plan to haul
a load of



SPRING FERTILIZER
on the return trip

Play safe and get your fertilizer stored in your own barn. War conditions have decreased the supply of fertilizer, and increased the demand. Late orders may be disappointed.

Co-operate With Your Dealer

Few dealers have sufficient storage space to carry large fertilizer stocks on hand. Shipments in less than capacity car loads—40 to 50 tons—are discouraged—even refused.

Co-operate with your dealer—place your order now—enable him to combine orders and make up a full car load. When your car arrives haul as soon as possible—on one of your return trips. Take part of the fertilizer directly from the car if you can. Hasten unloading—free the car for other uses.

Order Spring Fertilizer NOW

Make certain of your supply and at the same time do your part toward relieving railroad congestion.

Send for literature to Department 9

Soil Improvement Committee
of the National Fertilizer Association

Postal Telegraph Bldg., Chicago The Munsey Bldg., Baltimore

When Writing to advertisers please state that you saw their ad. in The Michigan Farmer.

to these machines without any alterations or extra holes in the binder frames.—From Cooperative Tractor Catalogue.

BUYING A TRACTOR.

The high prices and scarcity of labor at the close of the Civil War ushered in the era of the general use of the reaper. Likewise, the demand of the world for food stuffs and shortage of farm labor incident to the present world conflict will bring a rapidly growing demand for the farm tractor.

I have had opportunity to study the tractor development over a pretty wide

Many of the tractors now offered are pretty well tried out and so well constructed as to be an economical proposition on many of our eastern farms. Great improvements will be made during the next few years. But we cannot wait until all the experimenting is done. So we bought one after careful investigation and study, and after seeing most of the different makes at work in the field. The little machine we bought embodies as many desirable points as we could in our opinion, secure in one machine. It weighs three thousand pounds and is rated at 9-18; that is, nine horsepower on the drawbar and eighteen on the belt. It seems about as well constructed as an automobile and what little time we have used it seems to show that it is well adapted to our work.

Starting Our Tractor.

It went rather awkward to operate it at first but we were soon able to do a better job of plowing than could be done with horsepower in the same field. It draws two 14-inch bottom plows and on the plowed land we were able to draw three harrows, well weighted. We find the self-steering attachment very convenient, as the operator can give attention to adjustment of the plows and look after things in general while his attention is not needed at the steering wheel all the time.

Perhaps sentiment had something to do with our

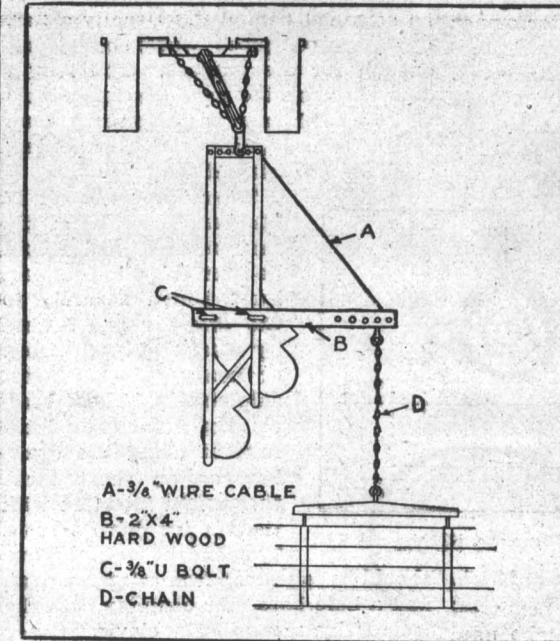


Fig. 5.—Hitch for Plows and Peg Harrow.

field, and I am convinced that farmers are often led to make unwise purchases through extravagant claims and smooth-tongued salesmen and when the money is in the pocket of the seller it is impossible to secure full consideration from the complaint of the purchaser. The way to avoid such losses is to have the machine put on your farm and tried out thoroughly before settlement is made, or know that the machine is proved satisfactory in the hands of others similarly situated. Then, too, it is well to know something of the reliability and character of the concern offering the machine.

The farmer buys a tractor with the expectation of its doing real work and plenty of it, and it is foolish to expect the poorly constructed, make-shift affair of any kind to be satisfactory or an economical investment. The construction should be as good as that which goes into an automobile, and the purchaser cannot expect to get this kind of construction at a low price. The get-at-able-ness of the machine for repairs and adjustment is a point of no inconsiderable consequence. Every machine will need both repairs and adjustment after being used for a time. The readiness with which these can be made will then be worth while.

The user of the tractor must learn the possibilities and limitations of his machine. These will be found to lie in a somewhat different direction than with horse power. The limitations of the horse and his possibilities are so well known by the experienced farmer as to require no thought. They are a part of his farm experience. Experience with the tractor will teach the user what to expect of it and what it is incapable of accomplishing. In gaining this experience we must expect to encounter difficulties and make many mistakes.

buying a tractor for our farm. It seems to offer an opportunity to apply skill and efficiency to our farm work in greater degree. I am sure the tractor will add much to the joy and satisfaction we derive from our farm, and will enable us to increase production, or do more with less manual labor. As to whether it will be an economic or a profitable investment, remains to be proved. I am sure we are going to get a lot of pleasure and satisfaction out of its possession and use and in my estimation this is worth much. Then,

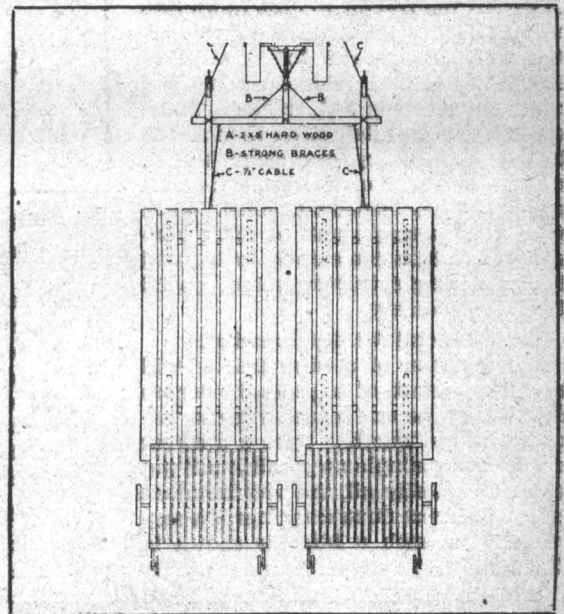


Fig. 4.—Hitch for Two Hay Loaders.

too, there is a feeling of satisfaction in the experience gained in advance of the majority, which experience we hope to use in aiding some of our fellow farmers.

J. T. CAMPBELL.

POTATOES SOLD BY WEIGHT.

Potatoes are now sold at wholesale on the hundred-weight basis, not by the bushel as formerly. The United States Food Administration makes this announcement so that persons comparing current prices will not confuse them with quotations referring to bushel measure.

The Labor Problem

By PAUL H. EATON

WITH the increasing shortage in farm labor and the growing difficulty in solving the help problem, we are beginning to appreciate more than ever the value of labor-saving machinery and tractor power in farming. The tractor cannot be expected to do away entirely with horses, for horses fill some needs that cannot be reached by the tractor, but the use of a tractor does assist materially in solving the hired help problem. One man with a tractor can do heavier work and more of it in a given time than is possible without the tractor. During the busiest season of the year the tractor can be operated day and night if necessary. This, in itself, sometimes means the saving of a crop. Then, too, the time when we are in greatest danger of losing a crop, is the very time when extra help is costly and hard to get.

The method developed for stacking alfalfa hay by one farmer who produces annually several hundred acres of this valuable crop is unique and efficient. He has constructed a movable slide or trestle over which the entire rack-load of alfalfa is dumped upon the stack at a single pull of the tractor.



Unloading A Wagon Load of Hay at One Haul with a Tractor.

tor. As the stack grows the slide is moved up and down its length so the hay is delivered evenly where needed to balance the stack. To facilitate unloading, a large rope net is laid upon the rack before loading with the self-loaded in the field. When the load drives alongside the stack, a long rope from the tractor, which is stretched over the top of the stack and slide, is attached to the net, then the load is ready to be dumped—a matter of less than one minute's work. In the field as well as at the stack on this farm, the work is accomplished with the minimum quantity of man-power. Not only that, but it is efficient.

Efficiency gained by tractor power is being supplemented in many ways by labor-saving machinery. Right now with the shortage of corn huskers and the price of husking ranging around seven and eight cents per bushel, the use of the mechanical corn huskers is gaining. The work of the mechanical corn huskers is rapid and efficient. Those farmers who have used them are greatly pleased with the results.

Perhaps the growing demand for power farming and the necessity for labor-saving machinery may tend to stimulate the inventors of improved farm machinery to turn out new and better labor-saving devices that will help to solve the hired help problem that is so sorely trying many of our farmers today.

HOW THE STATE OR INTERESTED CAPITALISTS MIGHT HELP.

In these days of acute need of fuel and food also, it seems to me the men who are idle for a time might be mobilized to mine the great fuel supply to be found in the stump lands of parts of Michigan supplied by railways, such

as the Pere Marquette, G. R. & I., M. C., and A. A. roads which pass through the cut-over pine stump lands of the northern half of the lower peninsula.

Individually there are very few cases where such men could do this, but the state acting for the general good in an emergency, or patriotic citizens who have money to advance, might take hold of this matter and within a few days, or at least a few weeks, have companies of men at work who, in return, could pay back the first cost with such margin as would insure a just compensation for such advances. Committees could locate lands suitable for the purpose and make arrangements with the railroads, secure the necessary machinery to handle the products on main lines or branches, and secure composites or temporary boarding houses for laborers at just rates, or make such other plans as their investigations might suggest.

Stump machines and explosives could be used to get pine stumps out and in shape for fuel.

Traveling cranes, to run on standard guages, or simpler devices when these are not economically available, could be used in the handling of the stumps.

In some cases, the stumps should be reduced to size fit for use along the tracks and in others they could be haul-

ed in larger sizes into cities and villages and cut up there by men who could then live in their own homes while doing so.

Lands could be selected that would make fair agricultural lands when the stumps are removed. Such lands would then be available for the raising of food the next summer.

There are thousands of acres of lands covered by pine stumps which are much better farming locations than some of the heavier lands formerly covered by hardwood which have, through wrong handling, been reduced in fertility and the humus robbed from them.

These pine lands require careful handling, but they could be inspected and in part selected by state officials.

The very light lands covered by jack pine ought never to be so improved.

Lands excessively hilly, and those on which it is impossible to get fair air drainage in which condition they would be frosty, should not be improved so long as there are others available.

But some of the pine stump lands are quite heavy clay or gravel lands and if a proper rotation were maintained with corn, beans or potatoes for a first crop and alfalfa as soon as possible with sheep, cattle and other stock to return much of the fertility they would make good homes for thousands. But as few have machinery and those who do have it cannot employ it all of the time, the great advantage to be gained by it is not utilized.

Genesee Co. E. H. ALLYN.

Don't forget the importance of ordering needed materials and equipment at the earliest possible date. It is the only sure way of having them when needed.

Don't be crowded off the Cars

Right now you should order the fertilizer shipped which you will use next Spring.

The railroads, crowded to the limit with Government freight, require all cars loaded at least ten per cent above their marked capacity in order to handle necessary and essential freight.

This means that every fertilizer agent must bunch his orders to make up large carloads. This takes time, and cannot be done at all unless farmers will place now their orders for immediate shipment. Agents cannot take orders at the last moment and have them shipped as they come in. They must plan ahead. If you do the same, you will help the Government, the railroads, the fertilizer manufacturers and agents, and not least of all, you will help yourself by making sure of your fertilizer.

Don't be crowded off the cars. Order your fertilizer early.

If we have no agent in your town, we want one. Write us for agent's name or ask for an agency yourself. It is paying 50,000 others. Why not you?



know? By making little changes here and there, as you sometimes shift your farm labor and teams, perhaps you can make more. This book may help you.

READ THIS BOOK

No matter how many other books about fertilizer you have read, *read this one*. It is a new and different book. There isn't any advice in it for one thing. Probably you have about all the advice you need already. This is just a common sense book. You will read it and say: "That's so! Why haven't I thought of that before." If you are using fertilizers you are probably making money with them, but *are you making enough?* How do you

SEND THIS COUPON

Send me "How to Make Money with Fertilizers." I expect to use.....tons of fertilizer this season. MF
My Name.....
My Post Office Address.....
My County.....State.....
My Crops for 1918.....

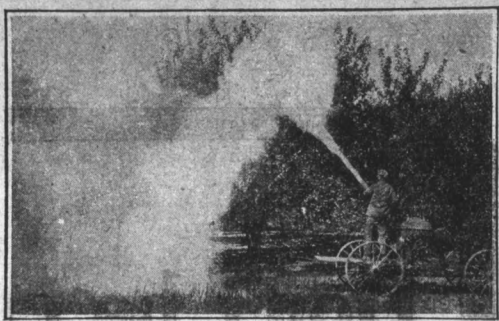
The American Agricultural Chemical Co.

Detroit Sales Department
Detroit, Mich.

The Company maintains an Agricultural Service Bureau conducted by Dr. H. J. Wheeler, (for many years Director of the Rhode Island State Experiment Station), whose Crop Bulletins, services and advice are free to all farmers.

We ship from 60 different centers east of the Mississippi. This means good service for you wherever you live.

*Niagara
Dusters*



Capacity 40 Acres a Day. In 40 Year Old Apple Orchard

Niagara Dusters Save Labor, Time and Material and Insure Better Fruit

they combine efficiency with simplicity, durability and lightness of weight—operated by any three-horse-power engine. They apply the dust so rapidly that frequent applications can be made over large acreage at critical times.

Dust Apples, Peaches, Cherries, Plums, etc. 1917 Developments in Material

For APPLES—A Niagara mixture has been developed which will control fungus diseases (apple scab) chewing insects (leaf roller and codling moth) sucking insects (aphis and red bugs).

For PEACHES—Niagara Peach Mixture has been developed to control Brown Rot, Peach Scab and Curculio without damage to the foliage, and late applications have been found to produce marked improvement in color as well as keeping qualities.

This is Important to You this Year

Every user of Niagara Dusting Machines is assured a supply of Niagara Dust Mixture. We have purchased enough raw material in advance to supply you.

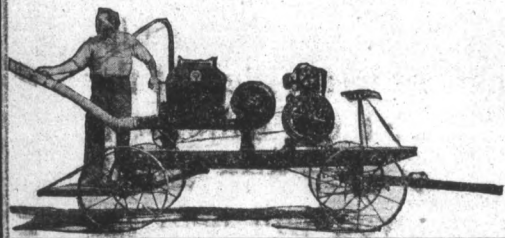
Write for Free Book on Dusting

which describes our various hand and power models. Tell us the size of your orchard, and the kind of fruit. Let us show you how to make your orchard pay better.

NIAGARA SPRAYER COMPANY

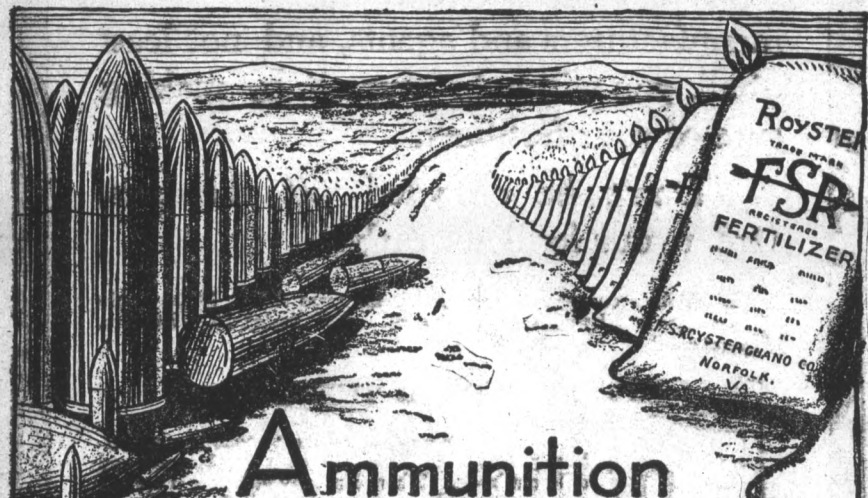
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MODEL D-1

Shown complete in every detail (no extras—Niagara Dusters are shipped ready to run). This is the largest size duster and requires a 3-horse-power gas engine shown here mounted on special wagon adapted for Apple orchard work. Also shipped on skids with or without engine. (New Way Air-cooled).



Ammunition

Every furrow is a trench in which the farmer can fight for his country as effectively as the man at the front. It is equally important that he has no defective ammunition. Every sack of

Royster's Fertilizer

is made with the scientific precision of a high explosive shell. The same rigid inspection by expert chemists is given to Royster's Fertilizers as is given to the ammunition sent to the front.

The experience, the skill and the strict enforcement of high standards which for 35 years have built the Royster success will be concentrated upon making every sack of fertilizer that bears the F.S.R. brand a missile of production to combat those of destruction.

F. S. ROYSTER GUANO COMPANY

Mid-West Sales Division

Toledo, Ohio

(1)

The Leaf Spot of Plums and Cherries

By DR. G. H. COONS

BADLY defoliated cherry and plum trees are annually a common sight in many Michigan orchards. The condition is due to attacks from a disease which shows up early in the season by making the leaves turn yellow or become ragged and shot-holed in appearance.

This trouble is known as leaf spot, a disease which results from the attacks of a parasitic fungus or microscopic plant which makes no food for itself but steals its living from the cherry or plum tree. The fungus gains an entrance through the leaves, grows in the tissues and produces brown dead spots. In some cases the spots dry, become brittle and are eventually whipped out by the wind. At other times a dark spot about one-sixteenth of an inch in diameter is found on the leaf, which turns yellow as a result of the parasite's work. At the same time, on the under side of the diseased leaves white or pinkish gummy masses may be noticed. These are made up of enormous numbers of the small seed-like, reproductive bodies of the fungus—the spores. When these gummy masses are wet, the spores float in the water and are splashed about by rains. This explains why the disease is most severe in seasons of abundant rainfall. Spores splashed from a leaf and lodging on the new leaves sprout and bore into the tissues, causing similar spores with other crops of spores in a week or two.

Disease Winters on Leaves.

The general effect of the fungus is to produce a casting or dropping of the leaves. The diseased leaves of cherries drop at the slightest jar. The fungus lives over winter on these fallen leaves and produces on them its winter spores. In the spring the spores are popped, under favorable conditions of moisture and thus reach the leaves. For such infections the unfolding summer spores are produced, and the infection of new leaves is repeated with each rainy period.

The disease cripples badly the leaf surface of the trees. All the starch and sugar which is found in the fruit is made by the leaves. Therefore, anything which cripples them cuts down the crop. But as the disease commonly appears after the crop is harvested the fruit grower frequently fails to recognize the loss which it brings about. The dropping of the leaves produces its greatest effect on the next year's crop, keeping it always mediocre and frequently producing conditions in which the trees produce only small, poorly-flavored fruit, which ripens unevenly. Much of the food material found in the fruit must be made by the leaves of the preceding season and stored in the twigs. Another effect of this disease is to render trees which have lost their leaves very susceptible to winter injury.

Readily Controlled.

The "leaf spot" is readily controlled by summer sprays of dilute lime sulphur. Ordinary commercial lime sulphur used at the strength of one part to forty parts of water, is commonly employed in Michigan orchards, applied according to following schedule:

- First—Just before the buds open.
- Second—Immediately after the blossoms fall.
- Third—Ten days or two weeks later.
- Fourth—Every two or three weeks, depending upon the weather conditions throughout the growing season.

In the first two sprays two and a half to three pounds of arsenate of lead should be added to every fifty gallons of spray. This poison controls curculio. With Japanese varieties of plums self-boiled lime sulphur mixture should be substituted for the commercial lime sulphur.

In addition to this control measure,

plowing under the leaves from the preceding crop before infection of the new leaves in the spring can take place is strongly advised. This is a sanitary measure and gets rid of the greater part of the sources of infection.

In every community one finds plum and cherry trees with the foliage badly diseased. It is not unusual to find cherry trees in July and August without a single leaf. Some growers think the trees are dead and cut them down. Examination would show that the buds of next year's shoots are already formed and the trees are still alive. Trees in such a condition, however, are extremely unprofitable.

The good market for plums and cherries makes these fruits deserve better care on the part of orchardists. Michigan is rapidly becoming a great cherry-producing state. If the greatest profits are to be secured the trees should be regularly and thoroughly sprayed to prevent the enormous annual loss which comes from this disease.

GARDEN NOTES.

There is no need to advise anyone to make a garden. The desire for a garden has clung to man since the days of Adam. It has grown with him into the desert and the swamp. Even city walls cannot keep it out of the family life if there is a foot of soil warmed by good sunshine.

The first attempt at gardening was a partial failure, but that may have been because it was too easy. Had Adam been called upon to save the seeds for himself, plow the ground and kill purslane, he might have been a little more careful. As it was, life went along without an effort on his part and indolence has no accredited place in a garden.

Winter is the breathing spell in the garden, but even then there is something to do. O, yes, we all know it, but there are other activities of more importance, at least they seem to be. So the garden is passed by.

Spread the Manure.

The chances are ten to one that a coat of manure will do no great amount of harm. Is there any better time to get it ready than now? It can be drawn and spread when the ground is frozen, or piled up in a convenient place. How much this means no one knows until it is tried. With the first good days of spring, after the frost is out, the ground can be plowed and with that it seems as though the work were half done. Early seeds can be sown and will be. The only way to prevent it is to lock the gate, for everybody wants to plant something in the spring.

The best is none too good for the garden. Well rotted manure, if it can be had, add to this wood ashes, if they are available, but do not mix the ashes with the manure as the lime in the ashes will liberate the nitrogen in the manure. Good commercial fertilizers fill a need in every garden. They make excellent supplementary fertilizers.

Other Fertilizers.

The value of coal ashes has not been definitely settled, but they have their uses. The value as a fertilizer may not be great, though that has apparently been underrated, but their addition improves the texture of some soils. Heavy clays need something of the kind to make them serviceable for garden purposes. Light, loose sand is benefited by the mixture with coal ashes, being made more retentive of moisture and fertilizing elements. It would hardly be advisable to haul coal ashes very far to use for this purpose, but in many cases those made at home can be disposed of in the garden to the advantage of all concerned.

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Grow More Small Fruit

By E. GREGORY

MANY writers deplore the fact that only a few of the farmers produce their own fruits, especially the small fruits, like strawberries and gooseberries. And it would be all well enough for more farmers to go into the production of such fruits. But I do not believe that it is practicable or even possible for everybody to do so. Fruit growing is an industry in itself. Growing those small fruits even in limited quantities requires considerable time just when the regular farm crops must have attention. And no one can afford to neglect his corn crop for a few quarts of strawberries—not if it is possible to buy them. They come on just at corn planting time. So do gooseberries. And they must have plenty of attention before this time. So it doesn't seem advisable for anyone to bother with those things if he has field crops and stock enough to keep him busy.

A Farm Cash Crop.

However, all small farmers, truckers and gardeners can well afford to give plenty of time and space to the production of the small fruits. They provide a cash crop early and may be taken to market along with the vegetables.

Again, there seems to be a general mistaken notion as to the soil requirements for the production of small fruits. I have never been able to get a paying crop from thin soils. The better the soil, the more and better the fruit. You can't get soil too rich for the small fruits. If you make use of green manures and stable manures until the ground is as rich as it can be, and loose and full of life to a depth of a foot or more, and then apply mineral fertilizers liberally, you may reasonably suppose that you have a fit soil for the production of the small fruits.

Small Fruits Need Care.

There is also a belief, all too widespread, that the small fruits require but little attention. But in my experience the reverse is true. They require a great deal of attention, and constantly. And the longer the patches stand the more attention they demand. The plants get too thick, weeds come up and smother them, pests and plant diseases multiply. All this must be remedied. The plants must be well cultivated, thinned, sprayed and pruned. And many of the small fruits must be mulched and otherwise protected from the severe weather of winter.

Here with us, currants and gooseberries demand a great deal of attention. But our most difficult problem with currants is to get them safely through the winter. They should be planted in a sheltered place where they will be protected from the severe winter weather. If our gooseberries are neglected for a year or two they begin to fail at once. They must be well cultivated to keep them growing. They must be sprayed regularly to protect the fruit and to keep the bushes free of disease and pest. They must be thinned and pruned each year in order to keep them from getting too thick and to make a growth of young wood for bearing fruit. For, the older the wood the fewer the berries and the poorer the quality. It's the young wood, always, that bears the most fruit and the best fruit—whether it's apples, peaches, gooseberries, or what-not. So when you sum it all up, there is some considerable work connected with the production of gooseberries.

Gooseberries for the Farm.

Speaking of varieties of gooseberries, I noticed that one of our Michigan Farmer correspondents recommends the thornless sorts because they are less troublesome to gather. Now I have never seen any thornless gooseberry bushes that produced good berries. They are very large berries, but tasteless, with thick, tough skins. Such are fit only for making preserves. You

can't sell them where they are known and you couldn't use very many at home. So, we can't find anything upon which to recommend the thornless sorts of gooseberries. There may be good sorts of thornless gooseberries but I have never yet seen any of them.

Those rich, meaty berries with that fine gooseberry flavor and thin, tender skin grow only on the thorny bushes. They are comparatively small but so much better that it pays to plant them, altogether. And if we keep the bushes properly thinned and pruned the thorns cannot interfere with the picking to any great extent.

I am trying only to state the facts in the case so far as my individual experience goes. It would be a great thing if every farmer could produce plenty of fruit. For we can't raise too much of it. The more there is raised the more the people will use. But I hate to see anyone jump in blindly, as I have done so many times, and lose both money and time on account of going about it in the wrong way. We now derive some little income from the production of small fruits. And many mistakes and failures are still so fresh in mind that I cannot resist giving out this word of warning. So far as I can see, nothing but failure awaits the man who expects to raise small fruits without giving to the business the most exacting care and attention from one end of the year to the other.

TROUBLE DEPARTMENT.

Cutting Scions and Root Grafting.

When is the proper time to cut scions, dig roots, graft German runes for foster-mother root grafting? I have a disease in my plum trees that is rotting the fruit, starting before they get ripe, and keeps on until all are gone. Blue fruit is worse than on yellow. On those plum trees there is an insect, a half-inch long, shaped like a fish, slimy as a fish, eating the leaves. What can I do for them? J. N.

The best time to cut scions is in fall after the foliage has dropped and before the severe winter season has set in. The usual method is to cut them about four to six inches in length, tie them in bundles of about twenty-five, and pack them in slightly moistened sand. The best place to keep them over winter is in a frost-proof cellar.

Root grafts should also be dug in the fall and kept in a manner similar to that suggested for keeping scions. Root grafting can be done at any time during the winter. Most of the nurseries keep men busy at grafting when they have no outside work for them to do.

The disease attacking your plums is one of the common rots which plums are susceptible to. These rots are more prevalent in some varieties than others. In normal seasons these rots can usually be controlled by spraying the trees about three times during the time the fruit is developing. The first application should be put on just before the blossom buds open, the second after the blossom shucks have fallen from the fruit, and the third ten days after the second. If necessary, another application may be made in the course of ten days. The best spray for this work is commercial lime and sulphur, one gallon diluted in forty gallons of water, to which should be added two pounds of arsenic of lead.

The insect which attacks your plums is the common slug. This is very often controlled by the spray suggested above, or can be controlled by the application of lime or road dust.

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Why?

True, the engine is colder. And gasoline vaporizes less readily. Starting is helped if you prime the cylinders, flood the carburetor or heat the intake manifold.

But there is one factor in overcoming this trouble that many car owners overlook. This is—correct lubrication. The lubricating requirements of your car may demand a different grade of oil in winter.

Winter lubrication requires special study. There are many factors to reckon with. The type of feed system is one. The size of the oil drillings is



Mobil oils

A grade for each type of motor

another. Exposed oil piping is a possible third. Other factors also enter in.

All these facts are carefully considered by the Vacuum Oil Company engineers in making up the Chart of Recommendations.

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The correct winter oil is listed for each make of car in our Complete Chart of Automobile Recommendations shown in part below.

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Gargoyle Mobil oil "B"

Gargoyle Mobil oil "E"
Gargoyle Mobil oil "Arctic"

In the Chart below, the letter opposite the car indicates the grade of Gargoyle Mobil oils that should be used. For example, "A" means Gargoyle Mobil oil "A," "Arc" means Gargoyle Mobil oil "Arctic," etc. The recommendations cover all models of both pleasure and commercial vehicles unless otherwise noted.

This Chart is compiled by the Vacuum Oil Company's Board of Engineers and represents our professional advice on Correct Automobile Lubrication.

Model of	1917	1916	1915	1914	1913
CARS	Summer	Winter	Summer	Winter	Summer
Abbott-Detroit	Arc	Arc	Arc	Arc	Arc
Allen (8 cyl)	A	A	A	A	A
Allen (Mod. 33-34-35)	A	A	A	A	A
Apperson (8 cyl)	A	A	A	A	A
Auburn (4 cyl)	A	A	A	A	A
Buick (6 cyl)	Arc	Arc	Arc	Arc	Arc
Buick (8 cyl)	Arc	Arc	Arc	Arc	Arc
Buick (Mod. 6-40)	A	A	A	A	A
Chandler Six	Arc	Arc	Arc	Arc	Arc
Chevrolet	Arc	Arc	Arc	Arc	Arc
Cole (8 cyl)	A	A	A	A	A
Dart (8 cyl)	A	A	A	A	A
Detroit (8 cyl)	Arc	Arc	Arc	Arc	Arc
Dodge (8 cyl)	A	A	A	A	A
Dodge (4 cyl)	A	A	A	A	A
Empire (6 cyl)	Arc	Arc	Arc	Arc	Arc
Federal	E	E	E	E	E
Ford	E	E	E	E	E
Franklin	A	A	A	A	A
Grant	A	A	A	A	A
Haynes (12 cyl)	A	A	A	A	A
Hudson	A	A	A	A	A
Hudson (Super Six)	A	A	A	A	A
Hupmobile	A	A	A	A	A
I.H.C. (air)	A	A	A	A	A
I.H.C. (water) (2 cycle)	A	A	A	A	A
I.H.C. (water) (4 cycle)	A	A	A	A	A
Interstate	A	A	A	A	A
Jeffery (6 cyl)	A	A	A	A	A
King (8 cyl)	A	A	A	A	A
Kissel	Arc	Arc	Arc	Arc	Arc
Kissel (Mod. 48)	A	A	A	A	A

Model of	1917	1916	1915	1914	1913
CARS	Summer	Winter	Summer	Winter	Summer
Kissel Kar. (12 cyl)	A	A	A	A	A
Lexington	E	E	E	E	E
Locomobile	A	A	A	A	A
McFarlan	A	A	A	A	A
Marmont	A	A	A	A	A
Maxwell	Arc	Arc	Arc	Arc	Arc
Mitchell (8 cyl)	A	A	A	A	A
Moline	A	A	A	A	A
Monroe	A	A	A	A	A
Moore (4 cyl)	Arc	Arc	Arc	Arc	Arc
National (6 cyl)	Arc	Arc	Arc	Arc	Arc
National (12 cyl)	A	A	A	A	A
Oakland	Arc	Arc	Arc	Arc	Arc
Oldsmobile (8 cyl)	A	A	A	A	A
Overland	Arc	Arc	Arc	Arc	Arc
Packard (12 cyl)	A	A	A	A	A
Packard (Mod. 1)	A	A	A	A	A
Paige (6-40)	Arc	Arc	Arc	Arc	Arc
Paige (6-38)	A	A	A	A	A
Pathfinder (12 cyl)	A	A	A	A	A
Pontiac	A	A	A	A	A
Pierce Arrow	A	A	A	A	A
Premier (Com'l)	Arc	Arc	Arc	Arc	Arc
Raglan	A	A	A	A	A
Raglan (8 cyl)	A	A	A	A	A
Reo	E	E	E	E	E
Saxon	E	E	E	E	E
Stearns-Knight (8 cyl)	A	A	A	A	A
Stearns	A	A	A	A	A
Studebaker	A	A	A	A	A
Stutz	A	A	A	A	A
Vette (4 cyl)	Arc	Arc	Arc	Arc	Arc
Westcott (16 valve)	A	A	A	A	A
White	Arc	Arc	Arc	Arc	Arc
Willis-Knight	A	A	A	A	A
Willis Six	Arc	Arc	Arc	Arc	Arc
Winton	Arc	Arc	Arc	Arc	Arc

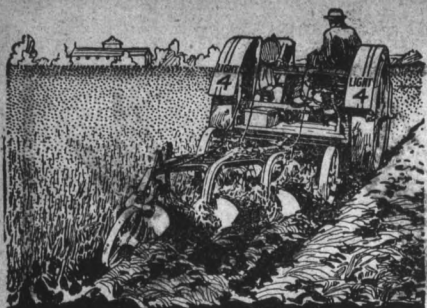
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also may be lubricated efficiently with Gargoyle Mobil oils. On request we will mail you a separate Chart specifying the correct grade for each make and model of tractor.

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Potato Marketing Problems

Some Observation on this Year's Experiences with the U. S. Food Administration Potato Grading Program

By C. W. WAID

SINCE the last article on the subject of potato grading, which was published in the Michigan Farmer, several phases of the work have developed which were not spoken of at that time; some of these are favorable and others not.

The United States Food Administration found it necessary, at first, to persuade many of the potato shippers that it was to their advantage to do grading as recommended by the Bureau of Markets. After this was accomplished protests began to come from the farmers in sections where early frosts or drought caused the development of a large percentage of small sized potatoes.

Round vs. Square Mesh Screens.

One mistake which was made at the start of the grading was that square mesh screens, 1 15-16 inch in size, were put into operation at most of the loading stations. These screens took from the first grade many potatoes which were in size up to the standard of U. S. Grade No. 1. Mr. Allewelt, of the Bureau of Markets, called the attention of the dealers to this unfair practice and some of the largest of them, as soon as possible, changed to the round mesh of the same size. Much less objection was raised when these screens were used than when the square ones were used. I believe that some of the dealers have not as yet secured the round mesh screens and the growers should urge them to do so as early as possible.

Letters of protest began to arrive at the offices of some of the newspapers of the state and some of them began publishing a list of these letters. Indignation meetings were also held in some sections and the agitation resulted in a feeling in certain sections of a very pronounced dissatisfaction. The chief complaint has been that Grade No. 2 is equal in food value, or nearly so, to No. 1 grade and yet the dealers only offer sixty per cent of the price of the first grade for the second. Many dealers, when this question first came up for consideration, expressed decided doubts as to their ability to sell the second grade to good advantage. The price which was suggested by them, but which was not compulsory, was one which, of course, would be safe for the dealers. The fact that the growers had not been accustomed to receiving two prices for two grades of potatoes naturally made them suspicious as to the reason for the difference in the price of the two grades.

Difference in Price Too Great.

It was without doubt, very unfair to some of the growers who had many small potatoes and who were forced to have them graded over the square mesh screens. In talking with several dealers about this unfairness the writer learned that most of them with whom he talked felt that after a market for Grade No. 2 becomes established that it would be possible to pay a higher price for that grade. This has been the experience of the dealers in other sections of the country where similar grading has been carried on.

The fact that the market declined because of the placing on it of a large number of cars in which field frosted potatoes were very numerous just at the time when grading was put into operation is another reason for the bad feeling on the part of some of the growers. Many of the growers in the state feel that they were assured a price for their potatoes, if not actually guaranteed a price, equivalent to \$1.00 per bushel and to sell the first grade for considerable less than this and the second grade for so low a figure they feel, as someone expressed it, "outraged."

At a meeting held recently at East Lansing at which practically all of the county agents of the state were present, the entire subject of grading was discussed from all angles. After the discussion was all over a vote was taken to see what attitude the agents had toward this matter. It should be remembered that all of them who are in important potato growing counties have heard at first hand the criticism offered by the growers to this method of grading. The vote which was taken was unanimous in favor of the grades as at present being enforced by the United States Food Administration. A campaign of education among the potato growers will be carried on through the agents to try to point out to them the ultimate advantage of this system of grading.

It should not be forgotten that the second grade, which is secured by running the potatoes which pass through the 1 15-16 mesh screen, over a screen with a one and a half-inch mesh, enables the farmers to sell potatoes of a smaller size than would be the case if one grade was made and one and seven-eighth inch or one and three-quarter-inch screens used.

Some of the reasons why the United States Food Administration is endeavoring to enforce the grading of potatoes throughout the United States, are here given:

A. For immediate benefit: To market the large crop of 1917 to the best advantage of the growers, dealers and consumers.

1. By providing for the marketing of sound potatoes only.

(a) That consumption of potatoes will be stimulated.

(b) That car equipment will be conserved.

(c) That all potatoes suitable only for stock feed will be kept and used on the farms.

B. For permanent benefit:

1. To establish standards of grades for potatoes and markets for these grades:

(a) That prices to growers may become more uniform.

(b) That growers may receive premium for quality.

(c) That dealers may be able to do business on a smaller margin of profit.

1. Because rejections due to a declining market will be avoided.

2. Because loss from decay will be greatly reduced.

3. Because of the elimination of the influence of inferior stock on the selling price of a car which is mostly up to grade.

(d) That consumers may get greater value for their money invested in potatoes.

THE GENERAL BEAN SITUATION.

Beans More Steady.—Demand rated slow in all the bean shipping sections. Pea beans are still quoted at \$12 per 100 lbs., hand-picked basis, cash to the growers at farm, in the Rochester, New York, district, with limited movement. In the Michigan bean country the price to farmers is quoted around \$11 and is reported at \$12.60@12.70 per 100 lbs. sacked, f. o. b. Michigan points. Colorado pintos show a slightly stronger tone in the shipping sections and have held a range of \$6@6.50 paid growers per 100 lbs., in bulk, recleaned basis, while choice recleaned stock sold at \$7@7.38 sacked, f. o. b. Denver with improving demand. Jobbing prices of Michigan pea beans ranged at \$13.75@15 per 100 lbs., sacked in large market centers, and choice New York pea beans at \$14.75@15. California small white sold at \$13.25@15, and range of California Limas improved 25c to \$13.75@15.25. Colorado pintos held at jobbing range of \$7.50@11 per 100-lb. sacked, with strengthening tendencies in some markets.



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STANDARDIZING MILK.

At the recent meeting of dairymen of the Empire State the subject of milk standards was considered. Dr. VanSlyke, of the New York Experiment Station, opened the discussion in an address on "Standardization of Milk." He said there is no authoritative standard for milk. We now have in mind some reasonable statement that is adapted to conditions. Adjusted is a better term to use in speaking of the ratio of fat to other milk solids in the milk. The ratio can be changed by increasing or decreasing the milk fats.

The effects of reduction of fat on the value of the milk was considered. In removing cream, only the fat is reduced. From normal milk testing four per cent of fat, remove one pound of fat for 100 pounds of milk, and a three per cent milk is left. What happens to the solids not fat? We do not materially change them. The standardized milk, with three per cent of fat, contains about as much of the solids not fat as does the four per cent milk. We can think of standardized three per cent milk as being about the same as the normal four per cent milk except it has one per cent less fat. Again the three per cent milk contains practically the same amount of solids not fat as a five per cent milk. If we remove cream from milk, we change the ratio and decrease the ratio of fat to solids. If we add cream, we increase the ratio of fats to solids.

Milk furnished by dealers can be adjusted to a fixed standard of food values, that might justly govern the price. Milk can be changed or adjusted without handling and exposing to bacteria. We have come to believe that normal milk should not be tampered with. There may be more than sentimental reasons for this. Legal standards of milk should conform its food value. It is desirable that all containers in which milk is offered for sale, should be labeled as to the amount and quality of its content.

Prof. Stocking, of Cornell, said it is logical that milk sold should have the same amount of fat every day, and the customer knows what he is buying. We may be forced to adjust the milk in order to justly serve the consumer. The only injustice to the consumer would be in adding cream to milk to bring it up to four per cent milk. Because he would get no more solids than he would have secured before the cream was added.

All milk should be sold on a guaranteed label the same as all other commercial foods.

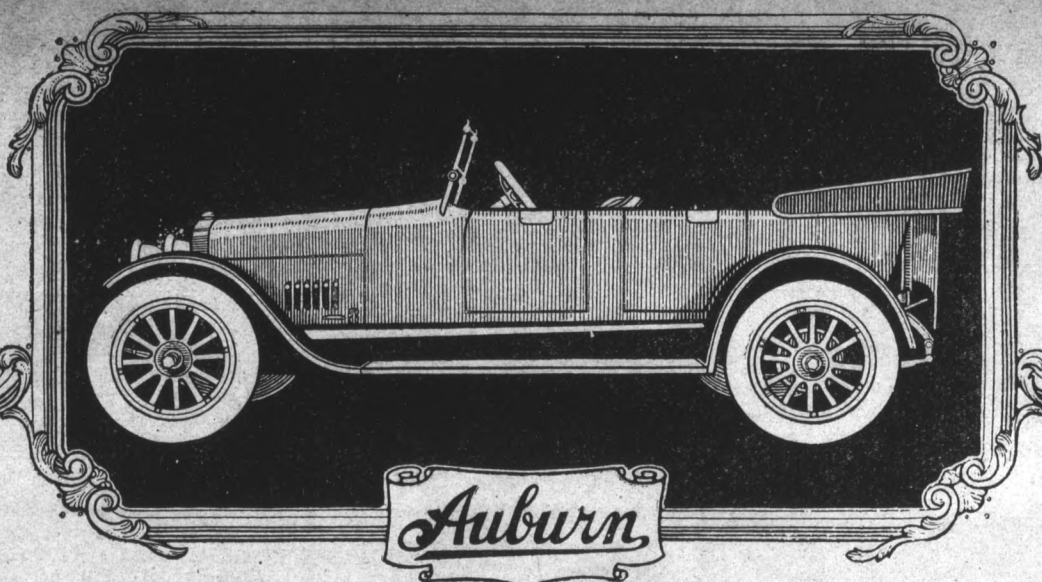
Mr. Brockway, along the same line, said there is no reason why milk should not be manipulated to meet the requirements of a standard, or to meet a special demand. It is a manufacturing proposition.

A. Wieant said the value of milk should be well understood. It is still the cheapest food we have for the digestible nutrients it contains. Milk contains every constituent of the body. Meat, potatoes and white bread do not. There is the least waste in milk nutrition than any other. Even at fifteen cents per quart, milk is still the cheapest food on the market. Compared with all the meats and fish on the market, milk is worth sixty cents per quart.

W. H. JENKINS.

On Friday and Saturday, December 14 and 15, while the worst early-winter blizzard of recent years was at its height, a goodly crowd of Holstein buyers, representing not less than eight different states, assembled in the Syracuse, New York, Sale Pavilion, and there paid a total of \$86,065 for the 148 pure-bred Holsteins offered which means an average of \$581.20 for the entire number, about one-half of which consisted of calves and yearlings.

The question of common sense is always, what is it good for?—a question which would abolish the rose and be answered triumphantly by the cabbage. —Lowell.



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Concrete saves lumber and steel for ships. A Sheldon Mixer saves labor and gets the work done besides. Designed especially for the farmer. Highly praised by users. Farmers everywhere say it's the ideal machine for them. Used now in every State and in a dozen foreign countries. Small enough to move easily—big enough to keep six men busy. Lowest in price. Build your own feeding floors, silos, tanks, troughs, foundations, cribs and buildings.

Read What These Sheldon Owners Say
I and my hired man laid a feeding floor for my hog, 24x24, in one day; also put floor in my cow barn. My neighbor liked it so well I am not able to keep it at home. —ANDREW CHRISTENSEN, Hancock, Minn., Rt. 1.
We have used the mixer during past year for putting in cement foundations for a complete set of farm buildings, including silo, and liked very much. —DANA WRIGHT, Jamestown, N. D.
Last year I bought a cement mixer from you with which I am well satisfied. It did not take long for it to pay for itself and I surely can recommend it to anyone needing a big mixer at a small price. —W. M. PARRIS, Martinton, Ill.
I am more than busy with my Sheldon Concrete Mixer. Have more work than I can do. Get \$10 a day when I work out. —JESSE L. WITTEB, Wellsville, N. Y.
The machine works fine. Have already got the job of mixing concrete for the bridges in this township. —JOHN ROSE, Sparta, Pa.
Last spring we purchased of you a set of castings to make a concrete mixer. It was constructed per the plans furnished and it surely worked great. —D. M. BAKER, Freeport, Ill.

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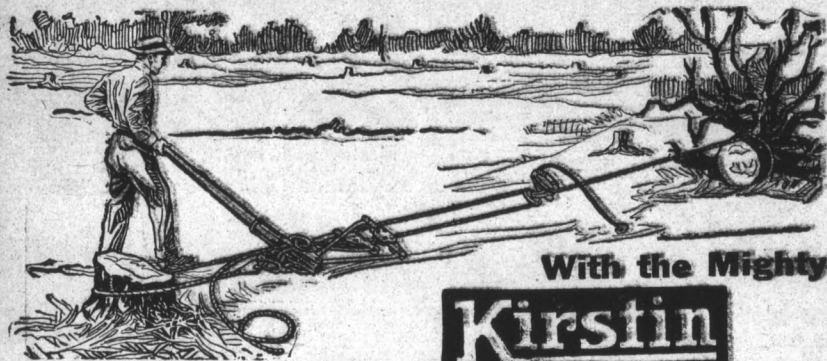
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The Live Stock Meeting

THE twenty-seventh annual meeting of the Michigan Improved Live Stock Breeders' and Feeders' Association will be held at the Michigan Agricultural College, East Lansing, Mich., on January 16-17, 1918. The programs of the general and allied breed meetings follow:

Thursday, January 17, 1918, 9:30 A. M.
Room 402, Agricultural Building.

Secretary's report.
Appointment of committees.
President's address.
"The Live Stock Industry, Present and Prospective," J. J. Ferguson, of Swift & Co., Chicago, Ill.
"Michigan Live Stock Situation," by Dean R. S. Shaw, M. A. C.
"Progress in the Eradication of Tuberculosis in the Michigan Herds," H. H. Halladay, Clinton.

Recess for lunch.

Meeting called to order at 1:30 p. m.
"Food Administration and Control as it will Affect the Farmer and his Market," G. A. Prescott, Federal Food Administrator for Michigan.

"Results to be obtained through Co-operation and the Effect of Cooperative Enterprises upon Rural Life," G. A. Miller, Chesaning, Mich.

"Essentials in the Successful Management of a Cooperative Live Stock Shipping Association," C. J. Miller, Union City, Mich.

"Advantages which we have Derived from the Farmers' Cooperative Store," C. B. Bebee, Tecumseh, Mich.

"Legal Aspects of Farmers' Cooperative Enterprises," R. H. Elsworth, M. A. C.

Wednesday, January 16, 4:30 P. M.
Room 402.

Joint meeting of all sections with the Michigan Crop Improvement Association.

Music, Short Course Orchestra.
Words of welcome, President Kedzie.
Song, M. A. C. Male Quartet.

"The Part that Agriculture Must Play in the Winning of the War," Dean Vivian, of Ohio State University.
Reports of the secretaries of the allied organizations.

Banquet tendered by the State Board of Agriculture to members of the Michigan Improved Live Stock Breeders' and Feeders' Association.

Michigan Horse Breeders' Association.
President, Jacob DeGeus, Alicia; secretary, R. S. Hudson, East Lansing.

Wednesday, 10:00 a. m., Pavilion, Agricultural Building, horse judging demonstration conducted by Dr. C. W. McCampbell, of Manhattan, Kansas.

Wednesday, January 16, Room 206.

Meeting called to order at 1:30 p. m.
"Showing at the 1917 International," President Jacob DeGeus, Alicia, Mich.
"The Farm Horse Situation," Dr. C. M. McCampbell, Manhattan, Kansas.
"Common Unsoundness of Horses," Dr. J. P. Hutton, East Lansing.
"Progress of the Stallion Law," Dr. Judson Black, Michigan State Veterinary Board.

Michigan Holstein-Friesian Assn.

President, H. W. Norton, Jr., East Lansing; secretary, M. W. Wentworth, Battle Creek.

Tuesday, January 15, 7:00 P. M.

Annual banquet, Plymouth Congregational Church, Lansing. Toastmaster, E. LeRoy Pelletier, Pontiac.

Wednesday, January 16, 9:30 A. M.

Room 402 Agricultural Building.
President's address and business session.

"Michigan's First Milk Commission," Hon. I. R. Waterbury, Detroit.
"Farm Building Construction," Prof. J. A. Kraege, Fort Atkinson, Wis.

Wednesday, January 16, 1:30 P. M.

"Accredited Herds," H. H. Halladay, President Michigan Live Stock Sanitary Commission.
"The Dairyman's Duty to His Country," Hon. G. A. Prescott, Federal Food Administrator for Michigan.

Michigan Shorthorn Breeders' Assn.

President, Jay Smith, Ann Arbor; secretary, W. W. Knapp, Howell.

Wednesday, January 16, 1:30 P. M.
Shorthorn show and judging of sale cattle conducted by Capt. T. E. Robson, of London, Ont.

Thursday, January 17, Room 109.

Meeting called to order at 4:00 P. M.
"Shorthorns and their Future," Wm. Johnson, Ft. Wayne, Indiana, representative of the American Shorthorn Breeders' Association of Chicago.

Michigan Aberdeen Angus Breeders' Association.

President, Alexander Minty, Ionia;

secretary, Dorr D. Buell, Elmira.

January 16, 1917, Room 402.

Meeting called to order at 2:00 p. m.
President's address, "How we can Stimulate Interest in Aberdeen Angus Cattle."

"Finding a Market for Our Surplus Stock," G. A. Prescott.

"Improving Our Herds," Cephus Buttes, Lewiston.

Discussion led by Alexander Minty.

Michigan Guernsey Cattle Club.

President, Harry Ballard, Niles; secretary, C. G. Parnall, Jackson.

Wednesday, January 16, Room 111.

Meeting called to order at 1:30 p. m.
An interesting program is being prepared. E. N. Onsrud, of the American Guernsey Cattle Club, will be the principal speaker.

Michigan Jersey Cattle Club.

President, Alvin Balden, Capac; secretary, Mrs. P. H. Walker, Kalamazoo.

Wednesday, January 16, Room 403.

Meeting called to order at 10:00 a. m.
Address by G. S. Taylor, Jersey Field Man for Minnesota.

Moving pictures.

Following this the association will take lunch in a body at the College Cafe.

Wednesday Afternoon.

Address by President A. Balden.

Reports from the county association secretaries.

Club reminiscences by John Breck, of Jackson, and T. F. Marston, of Bay City.

"The Dairy Situation in Michigan," State Dairy and Food Commissioner, Hon. Fred. L. Woodworth.

Michigan Red-Polled Breeders' Assn.

President, N. C. Herbison, Birmingham; secretary, E. J. Peabody, Mulliken.

Wednesday, January 16, Room 316.

Meeting called to order at 1:30 p. m.
"Starting a Breeding Herd," J. M. Chase.

"The Future of the Cattle Industry," Newton Parish.

"How Can we Best Attract Attention to the Red-Polls?" E. Foster.

"How Much Can a Small Breeder Afford to Pay for a Herd Bull?" Andrew Seeley.

Business meeting and election of officers.

Michigan Hereford Breeders' Assn.

President, Louis Norton, Quincy; secretary, Earl C. McCarty, Bad Axe.

Wednesday, January 16, Room 110.

Meeting called to order at 1:30 p. m.
This is the time for closer cooperation and greater unity of action among our breeders. Leading breeders of many sections of the state have signified their intention of meeting with us to advance the interest of the breed. Let each and every breeder be present.
Business meeting.

Michigan Merino Sheep Breeders' Association.

President, H. L. Mayo, of Nashville; secretary, E. N. Ball, Hamburg.

Michigan Shropshire Sheep Breeders' Association.

President, H. E. Powell, Ionia; secretary, W. H. Schantz, Hastings.

Michigan Hampshire Sheep Breeders' Association.

President, John Hull, Dimondale; secretary, C. A. Tyler, Detroit.

Michigan Oxford Sheep Breeders' Association.

President, N. A. York, Millington; secretary, I. R. Waterbury, Detroit.

Wednesday, January 16, Room 113.

Meeting called to order at 1:30 p. m.

Michigan Sheep Breeders' and Feeders' Association.

President, H. H. Hinds, of Stanton; secretary, W. H. Schantz, Hastings.

Wednesday, January 16, Room 109.

Meeting called to order 10:00 a. m.
"Sheep Grazing in Northeastern Michigan," Hon. T. F. Marston, of Bay City, Mich.

"How I Fed the International Carload of Prize-winning Lambs," E. G. Read, Richland, Mich.

"What we Hope to Accomplish by Extension Work in Sheep Husbandry," V. A. Freemant, M. A. C.

Michigan Swine Breeders' Assn.

President, J. B. Hibbard, Benning.

(Continued on page 14)

McQUAY-NORRIS LEAK-PROOF PISTON RINGS

The Piston Ring That Stands on Its Record—Not on a Promise

McQuay-Norris Leak-Proof Piston Rings have seven years of successful performance records behind them. Seven years building up a reputation with engineers and engine users founded upon what they've actually done in increasing engine efficiency and reducing operating cost.

Performance has proved the enduring quality of McQuay-Norris Leak-Proof material and the merit of its exclusive design by which alone equal tension (the secret of maximum compression) is possible.

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THE COUNTRY'S CALL FOR HOGS.

The Hog Shortage.—Hogs on Farms
September 1.

1916 65,645,000
1917 60,218,000

Decrease 5,427,000

The Corn Increase.

1917 crop, bushels 3,191,083,000
1916 crop, bushels 2,583,241,000

Increase, bushels 607,842,000

There is the gap—from a decrease of more than 5,000,000 hogs to an increase of more than 607,000,000 bushels of corn—that hog raisers are expected largely to close up. Closing it by breeding more hogs is not only one of the big opportunities but one of the big obligations of American farmers. Other equally convincing figures enter into the equation but these are sufficient for present consideration; they show the reason for the "more hog" campaign, now at its height, to urge that sows be bred in increased numbers now to insure the needed number of pigs next spring to eat the surplus of the 1917 crop.

That the farmers of the country will respond as "minute men" in the hog emergency is the belief of officials of the United States Department of Agriculture who are urging in conferences with live stock men definite hog increases by states, and who have just returned from a trip through the corn belt.

With the government backing them, through emergency legislation, as it never has before, farmers never have had greater assurance that their efforts would be justly compensated. The Food Administration has said that, until further notice, prices, so far as it can influence them will not go below the minimum of about \$15.50 a hundred, for the average of the packers' droves on the Chicago market. Furthermore, it has said as to hogs farrowed next spring: "We will try to stabilize the price so that the farmer can count on getting for each 100 pounds of hogs ready for market, thirteen times the average cost per bushel of the corn fed into the hogs." Experience has shown, specialists of the Department of Agriculture say, that this ratio of thirteen to one is liberal, and that it should stimulate hog breeding now. The Department of Agriculture, with increased forces, also stands ready to aid farmers in any way it can.

That is the immediate war duty of farmers: Breed sows now—and gilts if necessary. Breeding should be hastened, especially in the south. In the north it may be done until as late as February in some sections. But the sooner the new pig crop can be obtained, the sooner the urgent meat needs of the world will be met.

ABOUT SHEEP.

Those who have kept sheep during the last few years report large profits for the capital invested. As it is not likely that the present high prices received for wool and mutton will decrease, sheep raising is bound to increase.

We have kept sheep for a number of years and even during times when there was but little encouragement in the business we have seldom been without a small flock. Our experience has been that they require but a small amount of work or care. In the winter they do not need as much labor as other kinds of stock, and in this age of labor famine this is a very important matter to consider. If properly cared for, they are much more free from diseases and accidents than other cattle, and if one is lost from any cause, the loss is much less than if a hog, cow or horse is lost.

There are yet many farms having more or less rough land and steep brushland. A flock of sheep would not only do well on such land, but would aid the owner to clear the land besides. Then, too, a flock could be kept

Women Always Enjoy Traveling
in a Pullman Car

Just think how much it means to your comfort when you are traveling to have a night's sleep in a clean, comfortable berth that you can really go to bed in.

Then, too, it's very convenient to have the use of modern toilet rooms with soap, running water and plenty of clean towels.

The Pullman porter will make the passengers comfortable, and the obliging Pullman conductor is always ready to do everything he can for the passengers and especially for women and children traveling alone.

Ask the ticket agent for a Pullman ticket the next time you go anywhere, even a short distance, or the Pullman conductor will sell you a ticket on the car.

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YOUR HORSES

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A NEW AND BETTER
HOOK ATTACHMENT

Consisting of wire staple, reinforced with felt washer (note where arrows point). This gives the hooks a better hold and prevents pulling off. The weakest point is made strong and life of pad greatly lengthened.

Found Only on Pads Made by Us.
Look For The Felt Washer.

SOLD BY DEALERS EVERYWHERE
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GREENFIELD, OHIO
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Pat. in U. S. Dec. 1, 1914.
Pat. in Can. Apr. 6, 1915.



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TIMOTHY SEED \$4.00 per bushel. High purity and germination, first class in every way. Timothy-Alsike Mixture \$4.50 per bushel, 45 lbs. Bags extra at 25c. each. YOUNG-RANDOLPH SEED CO., Owosso, Mich.

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is a great success. After smoking meats use for store house. Made in three sizes of heavy galvanized sheet steel. Fireproof. Guaranteed. Send for FREE BOOK which gives prize-winning recipes for Curing Hams, Bacon, Sausages, at home. Also get our low prices. Write today sure. **PORTABLE ELEVATOR MFG. COMPANY**, 272 McClun St., Bloomington, Ill.

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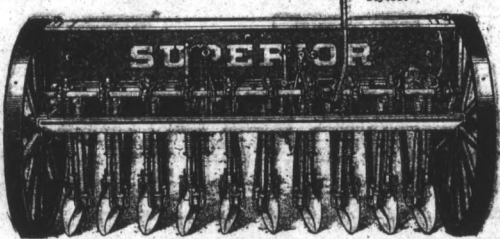
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with profit on some of the old, worn-out farms where the owners have been selling off hay and grain. The sheep would keep the weeds down and scatter more or less fertility on the land, and thus help to restore some of the lost fertility of the soil.

The principal objections that may be offered against sheep raising are the dog, and the necessity of good fencing. But at the present time, the progressive and up-to-date farmer cannot attach much importance to these objections. As to the dog, the laws of the different states are now so favorable to the sheep grower that it is not such a great bugbear, and if the flock is molested the loss is made good, and anyone has the right to destroy any dog found trespassing on his farm.

Sheep should not be expected to winter well around a straw stack, or in a shed with a poor roof, or in a draft, for they want a warm, sunny place. A bank barn is the ideal thing in which to winter sheep. Old sheep, if not too many in number, will do better than where old and young are kept together, and care should be taken not to herd too many together. Good ventilation should be given in the stables.

Indiana. D. LEATHERMAN.

SHIPPING SHEEP TO NORTHERN PASTURES PROVES PRACTICAL.

The shipping of sheep north in the springtime to browse through the summer and early fall on the cut-over lands of the upper peninsula and certain similar areas in the northern half of the lower peninsula is a profitably practical venture, the Michigan Agricultural College has become convinced. A representative of the college recently devoted some time to investigating the results attained by sheepmen who accepted the offers of free pasture made to them last spring and transferred their flocks to the up-state cut-over lands. His findings have been such as to remove any doubt of the feasibility of this project.

This enterprise was first suggested on a large scale last April when for the purpose of promoting food production, holders of these idle properties placed them at the disposal of sheep owners and cattlemen for the grazing of their animals. In most instances no rental fees were levied. At the time the project was suggested there were many doubters who questioned the practicality of it, but there were also many who were willing to make the experiment. These, the college investigator has found, are satisfied that the plan is an entirely workable one and recommend its wider acceptance by breeders and feeders of live stock.

His report declares in part that "one man shipped to pasture with his ewes 105 per cent of lambs and marketed ninety-nine per cent of lambs; another with a smaller flock, mostly registered Shropshires and Hampshires, says he raised 150 per cent of lambs, while still a third man who has been handling ewes in thousands thought seventy-five per cent of lambs was a fair average. It would seem accordingly that where flocks of from sixty to 400 or 500 are kept in good quarters through lambing time and sent with their lambs to pasture, seventy-five to 100 per cent should be expected."

HOW THE CHAMPIONS DRESSED OUT.

Merry Monarch, the grand champion steer of the International Live Stock Exposition, dressed out 54.7 per cent, according to figures compiled by Armour & Co., at whose plant the champion was slaughtered. Merry Monarch, alive, weighed 1610 pounds and the dressed weight was 1042.

The carload lot of Angus yearlings which were adjudged grand champions of the show, were also bought by Armour & Co., for the Congress Hotel, of Chicago. They averaged 1090 pounds

and dressed out 62.9 per cent, which means the average yield from each was 686 pounds.

THE LIVE STOCK MEETING.

(Continued from page 12).

ton; secretary, O. F. Foster, Ann Arbor.

Wednesday, January 16, Room 109.

Meeting called to order at 1:30 p. m. "The Reminiscences of the Pure-bred Swine Business in Michigan," J. B. Hibbard, Bennington.

"The Part that the Pure-bred Hog will Play in the Increasing of Pork Production," R. J. Evans, Secretary of American Duroc Jersey Breeders' Association.

"The Outlook for Profitable Pork Production and the Pure-bred Swine Interests," W. M. McFadden, President National Swine Breeders' Association.

"Pig Clubs in Michigan and How they will Benefit the Pure-bred Swine Breeders," W. E. J. Edwards, M. A. C.

Michigan Poland-China Swine Breeders' Association.

President, J. C. Butler, of Portland; secretary, P. P. Pope, Mt. Pleasant.

Meeting called to order at 10:00 a. m.

Wednesday, January 16, Room 207.

President's address.

"Words of Encouragement," Col. E. W. Foster, North Hampton, Ohio.

"Why the Poland-China?" C. A. Boone, Blanchard, Mich.

"Poland-China Boosters," W. M. McFadden.

"Poland-Chinas in the Feed Lot," W. J. Clark, Mason.

Round-table discussion.

Appropriate and attractive badges for every paid-up member.

Michigan Duroc Jersey Breeders' Assn.

President, C. U. Edmonds, Hastings; secretary, M. T. Story, Lowell.

Wednesday, January 16, Room 110.

Meeting called to order at 10:00 a. m.

"How to Advance Duroc Jersey Interests in Michigan," R. J. Evans, Secretary American Duroc Jersey Assn.

Michigan Berkshire Breeders' Assn.

President, J. F. Miller, Caledonia; secretary, B. B. Perry, Leslie.

Wednesday, January 16, Room 405.

Meeting called to order at 10:00 a. m.

Short business meeting and informal discussion by members of the club.

Michigan Chester-White Swine Breeders' Association.

President, Harry T. Crandall, of Cass City; secretary, J. Carl Jewett, Mason.

Wednesday, January 16, Room 316.

Meeting called to order at 10:00 a. m.

Annual meeting and election of officers.

Michigan Hampshire Swine Breeders' Association.

President, H. H. Halladay, Clinton; secretary, George Starr, Grass Lake.

Wednesday, January 16, Room 111.

Meeting called to order at 10:00 a. m.

President's address.

"Hampshires for Western Michigan," Alfred Hendrickson, Shelby, Mich.

"Why I Breed the Hampshire Hog," J. A. Campbell, Parma, Mich.

"Notes on Hampshire Herds of Michigan," G. E. Starr, Grass Lake.

Sales:

Friday, January 18, 9:30 a. m. Sale of 30 pure-bred Holstein-Friesian cattle.

Friday, January 18, 1:00 p. m. Sale of 84 pure-bred Shorthorn cattle, 54 females and 30 males.

Hotel Accommodations.

Visitors will find it to their advantage and convenience to secure rooms for the night in Lansing before coming to the College, inasmuch as the several sessions will be practically continuous from 9:00 a. m. until 10:00 p. m. The usual hotel rates prevail.

The Department of Agriculture is calling upon the farmers of the country to increase the supply of hogs and hog products 15 per cent during the coming year. It is a startling fact that at the time of all others, when the world-wide requirements for American hog products are far greater than ever before, there is a tremendous falling off in hog supplies, the production in this country has been decreasing ever since the war started in Europe, while exports of provisions have been increasing enormously. There are five million less hogs in this country than last year, and there are eight million less than two years ago. Recently published official figures show that this country has exported this year 891,000,000 pounds of hog products, valued at \$175,000,000; while in 1914 we exported 405,000,000 pounds, valued at \$55,000,000.

Home Grown Cows

By E. L. VINCENT

A NEIGHBOR of ours never raises a calf, always depending upon cows picked up here and there for such animals as he may need in his dairy. The reason for this, as he states it, is that he can buy cows cheaper than he can raise them. In this respect this friend of ours is representative of a large class of farmers. On the farms of these men we seldom see a calf or a heifer coming on.

But there is this thing that I notice. This neighbor, and others I know who do not raise calves, are all the time changing their cows off for one reason or another. While these men do not say so, I have my suspicions that this tendency to shift their stock is due to the fact that they do not get cows that are satisfactory when they buy them. It is a risky matter to buy cows, especially where one does not know the man of whom he buys. Nor is the fault always with the former owner of the cow. For it is a fact that the cow which may do well for you may be an entirely different cow for me, with my peculiar ways of feeding and caring for stock.

In my opinion, then, home-grown cows are the best all round. It may cost rather more to get these cows up through to maturity, but when we get them we know better what we have than where we step out and buy a strange cow. For cows are big bundles of peculiarities, some of which are inherited, more acquired.

I have watched this matter of personal characteristics quite carefully, and always with interest. Usually I have found that it is the mother which puts the imprint of her own disposition and eccentricities on the calf she brings into the world. If the cow is a long milker, we may look for the heifer she drops to be so, too. Little notions about standing when being milked, or being light-footed or disorderly, are also transmitted in many cases. In my own herd I have seen a long line of cows marked by the mother to be short-seasoned in the flow of milk. That is, they almost universally have the fault of drying off early, and not coming back until they have had a long period of rest. The loss from this kind of cows is great in the course of a term of years. None of us can afford to keep a cow that does not hold out in her milk yield.

Cows that grow up on the place have another advantage not always taken into account, and that is, they know what to expect from the man who has handled them from the start and they are at home in the pasture and in the yard with the other cattle. This shows itself strikingly when the cow is transferred to another environment. If a cow, for example, has always been treated kindly and has been kept with other cows that she likes to be with, and then is suddenly sold and put under the care of a man who has little feeling for his cows, looks upon them as "machines" and sends them out into the yard or pasture with a lot of cross, "scrappy" cows, she is almost sure to drop off in the flow of her milk. "Getting wonted" is what we say of the cow which is undergoing this change, and sometimes she is homesick and under the weather generally for a long time. I have brought cows in that way into my herd and seen them fight for days to settle the matter of who is boss. It is hard work; and sometimes I have had to separate cows that fought each other that way for a long time; and I am not sure but the best way is to dispose of one or the other of the belligerents rather than to have the herd all stirred up by constant fights.

Going a little deeper into this matter it is worth while to notice that when we grow our own calves we may be

mating cows of certain characteristics with bulls the parentage and qualities of whose ancestors we understand, get calves which are superior in many ways to any we can buy, and better than those we already have. And this possibility of breeding better stock is one that is well worthy of more attention than most of us give it.

DEHORN THE DAIRY HEIFER.

There are two methods of dehorning dairy animals. One of these which is widely practiced is to allow the horns to grow until the animal is fairly mature and then cut them off with special dehorning clippers. This method removes the horn but it is a painful and bloody operation. The other method is to prevent horns from developing.

The calves should be treated when they are from five to ten days old or when the horns are just beginning to show as small buttons and before they break through the skin. The hair should be clipped away from this part of the head with a pair of shears. As soon as the skin is thus made visible it should be broken with a sharp instrument, directly over the center of the appearing horn. A deep cut should not be made. As soon as the skin is broken a stick of caustic potash should be rubbed on the horn until the skin is removed over an area slightly less than the size of a dime. The caustic can be purchased in small white sticks about the size of a pencil. One end should be wrapped with paper or cloth to protect the fingers. Rubbing should continue over the surface until it begins to turn white. Too much rubbing may give bad results. As soon as this is complete it is well to grease around the treated area with vaseline.

It is usually better to use the caustic in a dry form rather than to use it wet because when too much moisture is present it may run down into the calf's eyes and cause injury.

The caustic should be kept in an airtight bottle because in the presence of air it becomes wet and sticky and is difficult to handle. With a little experience one can perform this operation in about five minutes and horns will never develop, says W. W. Swett, of the University of Missouri College of Agriculture. In case it is not properly done, short spurs will develop. These may be clipped off after a year or two with very little trouble or injury to the animal.

FINDING THE "BOARDER" COWS.

I have been in the dairy business for fifteen years with varied success. According to my experience it takes about five years for a cow to develop. Up to that age I am not positive whether she is going to be a "boarder" cow or not. Now if there could be some means provided to aid one in determining exactly whether a yearling is going to grow into a good cow or not, such means would prove very valuable to dairymen. Many of the heifers would be fattened and sold for meat while, on the other hand, not a few that go directly to the shambles without a trial at the pail would be given a chance to show their value as dairy animals. The scales and the Babcock test are the only accurate means we have of knowing what a cow can do, but these can be used only when the animals are producing, and as a heifer may prove to be a good cow after an unprofitable season or two, we cannot see where the practical dairymen are going to avoid the heavy expense involved in weeding out the "boarder" cow and at the same time not waste valuable potential dairy cow material.

Muskegon Co. H. D. WARNER.

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Cost of Producing Milk

THE general cry against the high cost of living has called attention, among other things, to the cost and profit of milk production. While the food controller is wrestling with the pros and cons of this question, it might be well to discuss briefly some of the points having a bearing on the producer's viewpoint.

In the first place we have in the dairy cow of average capacity an invested capital of approximately \$100. Consider the fact that she will produce well, barring accidents, until ten years old. She must then be turned off as a canner at \$25 or less, as being of a dairy type, no feeder at the present prices of food stuffs would consider it profitable to feed her for beef.

The question of feeding, of course, looms largely as a factor in milk production. Conditions are such that at the present time it costs upward of 125 per cent more to produce milk than two years ago. Formerly, the farmer who planned to buy certain necessary concentrates or other food stuffs with

comes to the question, "To feed or not to feed," it is a case of staying in the business at a profit or getting out of it as a failure. If any fault is found with the estimated prices above quoted, it will be that they are too low.

But, as has been indicated, the feeding cost of a cow is by no means the only cost. Labor, when it can be procured at all, comes high. This may be reasonably estimated at fifteen cents a day per cow. If there are, say, fifteen cows, this rate will figure out to \$2.25 a day and you board yourself.

The item of interest, while often overlooked by farmers, is the very first thing the manufacturer figures on in estimating his production costs. On the average 100-acre farm carrying a herd of about fifteen cows, the total investment in farm and equipment may be moderately estimated at \$10,000. Assuming that one-half of this is devoted to dairying, half the income of the farm should be charged as coming from that source. There would, therefore, be \$300 in interest charges to be



Sophie 19th, a Jersey Holding World's Record for Long Distance Production.

which to balance up the rations for his herd, followed the principle of laying in the required supply during the summer months when prices were low. With the crop shortage of last year this course is impossible at the present time. He does well if he can buy a few hundred weight to last him from day to day. This means that he must pay a retail price for raw material as well as sell his finished product at wholesale.

Anyone sufficiently interested to do a little detail figuring on the farmer's feed costs will find that the annual outlay per cow will not fall far short of \$80 if it does not surpass that figure. Add to this interest and investment, cost of labor, service of sire, depreciation of plant, insurance, and half a score of sundries, the cost of milk production per cow soars to the neighborhood of \$140.

Now a little as to detail. In making the foregoing statement as to annual cow costs, I have estimated the value of pasture at \$2.50 per month per cow, hay at \$10 per ton, silage at \$3.00 per ton, and roots at \$6.00. The grain figured on is that only that can be purchased at reasonable prices, and has a feeding value consistent with its cost. Perhaps someone who is more familiar with the consumption of milk than its production will advise to feed more cheaply and so let down the cost to all concerned. As a matter of fact, the writer has learned from his own experience as every practical producer has done, that the dairy cow is very much of a machine, and as such, will not give something for nothing. Even during the pasturing season, barring, perhaps, a few weeks in June, she will not milk up to her capacity without a light ration of grain, which must be increased as the season advances. When it

divided over fifteen cows, or exactly \$20 per animal.

Regarding bull service, it is doubtful if he can be maintained in good breeding condition for a year for much less than \$60. This adds another \$4.00 to the cost of each member of the herd. To this must be added insurance, veterinary fees, cartage of milk, upkeep and care of utensils, etc.—J. H. McK.

BUTTER CHEESY AND STRONG.

Upon reading the butter trouble of A. M. B., I thought immediately that I knew to a certain way out, taking it for granted that the milk is set and skimmed as we used to do before the wonderful separators were invented and manipulated by the men folks. If I am right, just scald that milk as soon as strained until it wrinkles well over the top, let cool before setting in cupboard or pantry. Let stand forty-eight hours or more before skimming. Keep cream stirred well once or twice a day. When ready to churn warm to sixty-five degrees, if necessary thin with skim-milk of the same temperature. Your butter should come about as quickly as from a new milk cow and be almost as good. Of course, it will not have the flavor of June butter, but I will warrant it will be the finest and best winter butter you ever ate. I take it that your cow was fresh last spring. Cows going dry in winter will surely make strong butter, no matter how perfect the feed, the care of cows and the milk. The nearer to freshening they are the stronger the butter will be unless milk is scalded. If separator is used scald and cool the cream on churning day. Temper water to wash butter the same as the buttermilk, or not below sixty degrees any way. S. A. W. G.

SOY BEANS AND CORN FOR ENSILAGE.

I would like to plant some soy beans with my silage corn. How is the best way plant them, and what kind would you plant? I planted some cowpeas two years ago with my corn, but the peas worked down in the bottom of the planter-box and planted out before the corn did—some rows would be nearly all peas and some would be all corn.

Macomb Co. L. S.

I have planted soy beans for years with my corn and I believe that I can say that it would pay any man to do the same. Some years you will get better crops with beans than you do others, the same as with any other crop, but taking everything into consideration, I believe one gets enough more fodder and a better kind of fodder, to amply pay him all additional costs. The seed required is comparatively inexpensive.

On land where soy beans have never been grown, I am quite positive that it pays to inoculate the seed. This can be done by getting some soil from a field where soy beans have been grown and which therefore contains the proper bacteria. That is easiest applied by the glue method; that is, the beans are moistened with water containing a small amount of glue dissolved in it, just enough to moisten the beans, then the dirt is sprinkled over the beans and thoroughly mixed until a portion of the earth adheres to each seed. Or, if you can't get this earth, you can get commercial bacteria and apply this. After the soil has become thoroughly inoculated further treatment is unnecessary.

Now, with regard to planting. There are certain manufacturers who manufacture corn planters with double planter boxes so that you can plant the beans and the corn at the same time. The seeds are distributed from different openings so the amount of each kind of seed can be readily gauged to the desired amount. Where one hasn't this kind of planter or can't get the adjustment to attach to the present planter, he can get very good distribution of the seed in the way you planted if you will only be careful and only put a small amount of seed in the box at once.

If you mix your soy bean seed with the corn and then fill up your planter boxes, the seeds are so small and slippery that they will work, as you say, to the bottom of the box and will be dropped first, but if you will only put enough of the mixture to go once across the field in the box at one time, you will find you will get a fairly even distribution. Now, it isn't very much bother to do this if you have seed on both sides of the field and every time you turn around put in a small amount of seed. After going once or twice around one can gauge the amount fairly accurately. In this way the beans don't have time to separate from the corn but go through with it.

Some people plant their corn with a wheat drill having the proper adjustments. If you do this, by putting partitions in the seed boxes of the drill you can sow the beans with the corn and regulate the amount by adjusting the opening for the beans so that you will get the proper distribution.

Again, if you drill your corn and will plant your corn first, then go right over the field again, following the planter marks and planting the beans, you can get a splendid distribution. Not only that, but going over in the first place has packed the ground a little so that the beans will not be planted quite so deeply and the shallower you can plant them the better.

COLON C. LILLIE.

Arrangements have been completed giving permission for the shipment of 40,000 tons of American corn and oats to Finland by way of Sweden. In order to make certain that the grain will not reach the Central Powers, an agent of the War Trade Board is being sent to Finland.

Where Disease Shows First

Just watch the milk yield for the first sign of weakening in the cow's system. If your cow is not giving the quantity or quality of milk you expect, it is time to give her medical attention.

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DAIRY ASSOCIATION CO.
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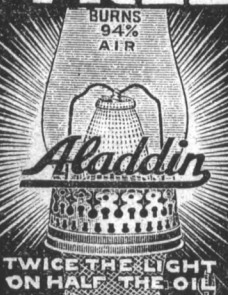
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Peas for Dairy Cows

I would like a little information in regard to what they call Canada field peas. How and when should one sow them? I have a dairy of thirty cows and would like to raise some kind of feed that would be rich in protein instead of buying so much expensive feed. Would it be advisable to sow oats with the peas? I have about eight acres of good black loam ground to sow them on.

Oakland Co.

W. K.

Canada peas are simply the common field peas that are grown in Michigan. Why they are called Canada peas I do not know, unless it is because large amounts of this crop are grown in Canada. Field peas used to be one of the main crops in that country. They were much more extensively grown in Michigan a number of years ago than they are now. One reason why they are becoming unpopular is on account of the weevil which gets into the peas and not only destroys some of the feeding value but it also weakens the seed for germination and lowers its vitality. People, however, have learned to combat the weevil on seed peas by treating a bin of peas with the bisulphite of carbon. This destroys the weevil.

Difficult to Harvest.

Then, too, the peas have a weak or reclining stem and they tend to lodge badly and it is difficult to harvest them with the reaping machine or the self binder. I believe that this also has had something to do with the crop becoming unpopular. We can harvest peas and oats much more easily than we can peas alone, because the oats hold the peas up. We have had to pull them with a special puller something like a revolving hay rake, and later on we had a special piece made to fit on the mowing machine guard, which assisted very much. But when this crop is grown alone it cannot be harvested as nicely and as cheaply as the grain crop. No tool has ever been invented which will handle this crop with its reclining habit, like crops that stand erect.

Peas, however, are a valuable stock food. They are rich in protein containing over twenty per cent of digestible protein. All stock like them. There isn't any kind of stock but what likes pea meal and there is no better food for the dairy cow. To balance up a ration of corn silage and clover hay, if we would only once get into the habit of raising more peas, as W. K. suggests, we would not spend so much of our money for protein feeds. I have advocated the growing of peas in Michigan for a great many years so as to get a home-grown food rich in protein that will balance up the ration of corn silage and clover hay and make a balanced ration for the dairy cow.

This crop is now grown almost invariably with oats. The principal reason for this is that if you get a good stiff strawed variety of oats they will help hold the peas up so that you can harvest them with a modern self-binder without any trouble. Then oats are no detriment to a ration for almost any kind of stock.

Value as a Feed.

If you use oats alone they will not balance the ration properly where the roughage is composed of clover hay and corn silage. Where peas and oats are grown together, harvested, and ground for grain one can nicely balance the ration. I don't believe that there is any better ration that can be devised than corn silage and clover hay, all the cow will eat up clean twice a day for roughage, and a sufficient amount of peas and oats to give her a full ration. My observation and experience is that you can't get anything that will coax more milk out of a cow than this, and it can all be grown on the Michigan farm so that the farmer need not pay out one single cent for a ration for his dairy cows. Of course, if he grows enough acreage of oats and peas so that he has a sufficient

amount of grain for his cows he can't raise other crops and he can't keep so many cows on the farm as he could if he simply grows the roughage and buys the grain. There is a chance for an argument here as to just which is the most economic practice.

If one is going to be short on clover hay or he loses a clover seeding, by sowing to peas and oats early in the spring and cutting them when the oats are in the milk, and when the pods of the peas are just forming, and curing them as you would cure clover hay it makes a splendid substitute for clover hay. In fact, if it is as well made hay as you make of clover it is equal, pound for pound, to clover hay. Cows, horses, and all kinds of stock like it just as well.

With good rich land in a favorable season you can raise as large a crop to the acre with peas and oats as you can with clover. However, even if I were short of hay I don't believe I would cut the peas and oats for hay; I would allow them to ripen, and thresh the grain. Then I would feed the peas and oats straw in place of hay. If you don't wait until the oats get dead ripe, but cut them as soon as the grain will do and properly shock and care for them, this pea and oat straw is better than timothy hay for cattle, and I would take my chances on feeding corn silage and clover hay once a day and pea and oat straw once a day, and then use the peas and oats as grain to balance up the ration.

Best to Sow Separately.

The way to raise peas and oats is to have good rich ground, a clay loam is the best, one that holds moisture and is rich in plant food. This should be fall plowed, or else it should be corn stubble and worked up early in spring. You want to get the peas and oats in the first crop on the farm, just as early as you possibly can. The best way is to sow the peas a few days before you do the oats and put them in deep, at least three inches. Then a few days later sow the oats on top crosswise, and don't put them in quite so deep. But most people, myself included, mix the oats and peas before sowing, using a bushel of peas to a bushel of oats by measure, mixing them together thoroughly and then sowing them at one operation, setting the drill rather deep. One can get good results in this way. They will respond to rich soil or to stable manure or commercial fertilizer as well as any crop grown on the farm.

When this crop is grown in this way in combination with oats there is very rarely any trouble in harvesting with a modern self-binder. Bind them up into rather small bundles and shock them up good and cap the shocks and then don't be in a hurry about hauling them. Let them stand in the shock a week at least, until they thoroughly cure out because you ought to cut them before they get dead ripe. They will cure out after a while so that you can stack them or put them in the mow. Then when you thresh them you have got a straw which is a good substitute for hay.

You can buy Canada field peas of any reliable seed man. Some farmers send direct to farmers in Canada and buy their peas. I always order them of the local dealer. They tell me that there are a great many varieties of Canada peas, but I know nothing about this, but simply order Canada field peas. If you get northern grown seed they are free from the weevil, and in all the southern part of Michigan it will pay a man to buy his seed every year, because the seed he grows will be infested with weevil and the germination power of the seed will be weakened. Anyone who has never grown peas and oats as the grain food for dairy cows, will find that they are par excellence as a grain ration.

COLON C. LILLIE.

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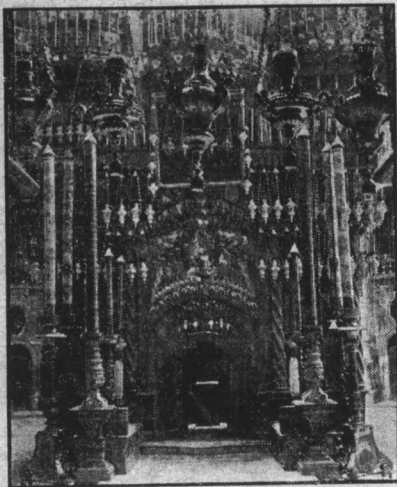
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This Magazine Section forms a part of our paper every week. Every article is written especially for it, and does not appear elsewhere

WORLD EVENTS IN PICTURES



Holy Sepulcher at Jerusalem—Turks Remove Jewels and Send to Kaiser.



Where Communication Trench Lines Cross Roads, Subways Are Constructed to Prevent Possible Congestion of Troops or Supplies.



Rebuilding Homes in Reconquered Portions of France.



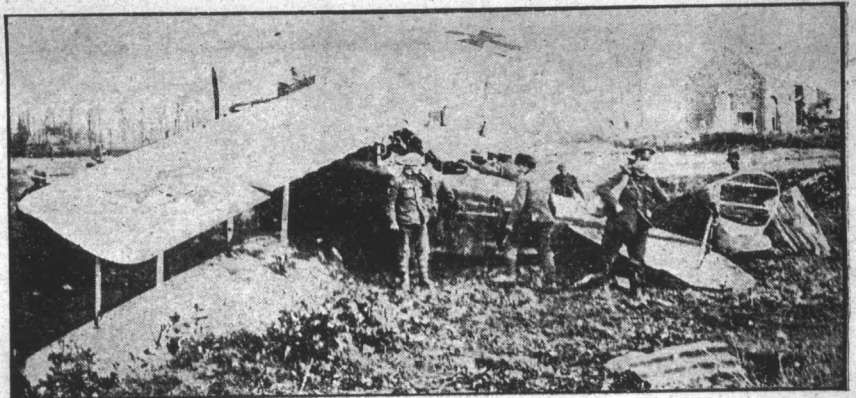
She Drives this Ice-boat at a Pace Equal to that of the Fastest Automobile.



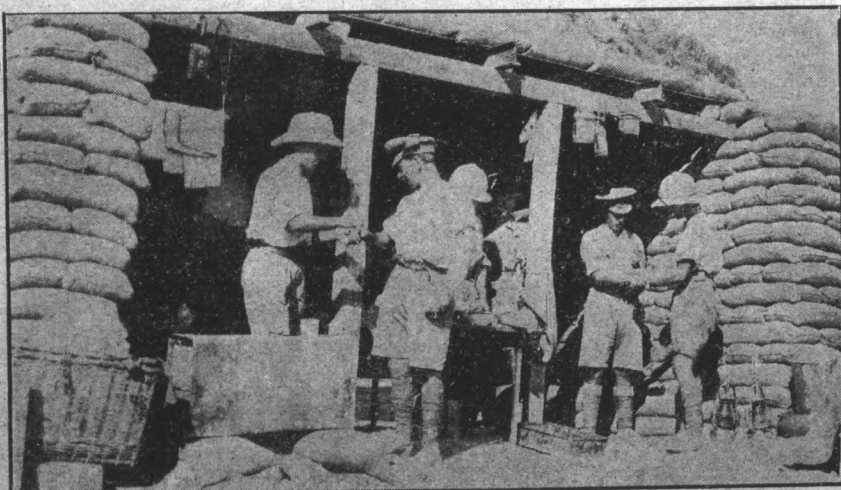
Big British Tank Rumbles into Action Through Streets of a Ruined Town.



Belgians compelled to Leave Homes when Germans Bombard their Village.



A Big German Biplane Made Prize of Allies in Recent Drive on Cambrai.

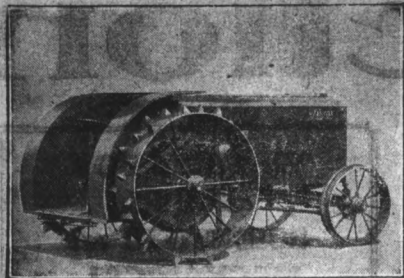


Advance Dressing Station of Victorious Troops in Palestine Campaign.

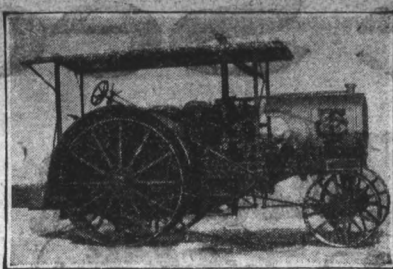


Portion of Famous Hindenburg Line Recently Taken by the English.

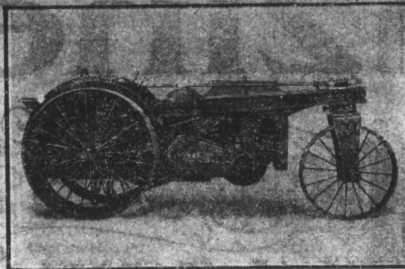
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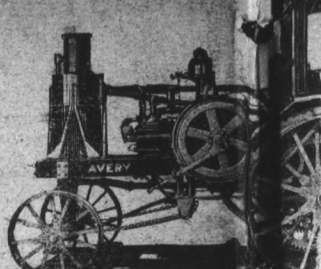
T. C. 25.



Chase.



Bissell.



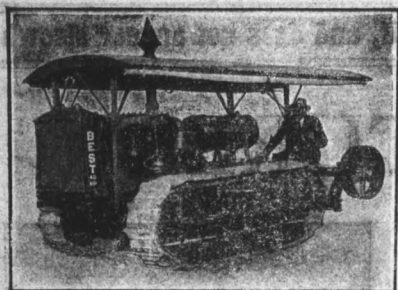
Avery.

Experience of Thirty

To present first hand information on how the modern tractor is adapting itself to the widely experience of thirty tractor owners living in twenty one different counties of the state and arranged made. In column giving kind of fuel used "K" & "G" stand for kerosene & gasoline respectively:

Number of Tractor Owner.	County in Which Owner Lives.	What is Size of Your Farm?	How Many Acres are Under Cultivation?	What is Character of Your Soil?	What Cash crops do You Grow?	Give Size of Your Tractor.	How Many Plows Does it Use?	What Kind of Fuel Does it Use?	How Much Gas is Required to Plow Acre?	How Much Oil is Required to Plow Acre?	Have Any Weaknesses De-veloped in Tractor?	Has Work Been Delayed by Fault of Tractor?	Enumerate Kinds of Work for Which Tractor has been Used.	Horses Used Before Buying Tractor.	Horses Used Since.	Has Introduction of Tractor Reduced Man-Labor?	Can You Keep as Many Acres as Before?	In Your Opinion do You Get
1	Berrien	1500	.....	.....	Peppermint	30-60	6	K	3	.....	None	No	*1, 2, 3, 6, 7, 12	40	40	6 less	Yes	Y
2	St. Joseph	120	120	Prairie	Wheat	12-20	3	G	4	1 pt.	Yes.	Yes	1	No Chng	Less		Yes	Y
3	Saginaw	205	160	Sand and clay loams	Sugar beets and beans	7-20	2	G	.....	.....	Yes	Yes	1, 8, 9, 10	7	7	Less	Yes	N
4	Delta	320	180	Clay loam	Wheat, oats, rye and hay	10-20	3	G	2½	1 pt.	No	No	1, 2, 3, 7	8	4	50% less	Yes	.....
5	Cheboygan	250	200	Sandy loam	120 acres apple orchard apples and potatoes	8-16	2	G-K	4	1 pt.	Sand cut cyl-inders	.....	1,2,3	8	4	One man less	Yes	?
6	Dickinson	191	115	Sand and clay loams	Potatoes and cabbage	10-20	3	G	2½	1 pt.	No	No	1, 2, 3, 7, 8, 13	5	3	?	Yes	Y
7	Saginaw	140	125	Clay loam	Beans, wheat, oats, po-tatoes	8-16	2	K	3	1 qt.	No	No	1, 2, 3, 7, 8, 9, 10, 14, 15	5	3	Do more work	Yes	Y
8	Saginaw	400	....	Not given	Hay, wheat, beets and oats	7-20	2	G	3	.....	No	No	1, 2, 3, 9, 10	10	8	One man less	Yes	Y
9	Kent	350	200	River bottom, gumbo	No cash crops	13-30	3	G	.....	.....	Trouble with governor	No	1, 8, 9	10	10	Do more work	Yes	.....
10	Ottawa	306	200	Muck, sand loam	Potatoes and beans	8-16	2	K	2½	1 qt.	Ignition trouble	No	1, 2, 3, 8, 16	9	6	Same	Yes	Y
11	Gratiot	200	150	Clay loam	Beans and wheat	8-16	2	K	3	.....	No	No	1, 2, 3, 4, 8, 9, 10, 15, 16, 17, 18	5	2	One less	Yes	.....
12	St. Clair	240	200	Clay and sandy loams	Not given	Not given	4	G	.....	.....	No	No	1, 2, 3, 5	.....	.....	.....	.....	.....
13	Manistee	300	70	Clay loam	Hay and oats	8-16	2	G-K	3	1 pt.	No	No	1, 2, 3, 4, 19, 20	4	2	One man less	Yes	Y
14	St. Clair	320	200	Clay and sandy loams	Wheat, oats and hay	20-30	4	G	3	1 qt.	No	Occasion-ally	1, 3, 8, 9, 10	6	4	Do work easier	Yes	.....
15	Gratiot	671	300	Clay loam	Wheat, beans and oats	20-30	4	K	.....	.....	Not enough power	No	1, 2, 3, 8, 9	9	7	Same	No	.....
16	Ottawa	400	300	Hardwood up-land, clay sub-soil	Canning crops, potatoes and wheat	30-60	6	K or G	3½	.....	Gears wear rapidly	Yes	1, 2, 3, 11, 15, 20	Same		Do work easier	Yes	Y
17	Kent	240	200	Sandy loam, Heavy clay	Peaches, wheat, pota-toes, corn, oats, and clover seed	8-16	2	G or K	2½	1 qt.	No	No	1, 2, 3, 8, 17, 21	9	4	50% less	Yes	Se-14 N
18	Mason	230	....	Clay loam	Peas for canning, wheat hay	8-16	2	K	3½	.....	Need more power	No	1, 2, 3, 8	Same	Same		Yes	Y
19	St. Clair	200	150	Sand, clay	Dairy products, hay and wheat	12-24	3	K	4	1 qt.	No	No	1, 3, 8, 9, 10	6	4	1 less	Yes	.....
20	Hillsdale	440	300	Cobblestone and gravel	Wheat and potatoes	8-16	2	K	3½	1½ pts	No	No	1, 3, 7, 8, 9, 11, 16, 18, 22	8	4	1 less	Yes	.....
21	Shaiwassee	420	....	Sandy loam	Wheat and beans	8-16	3	K	3½	1 qt.	No	No	1, 2, 3, 8, 10, 16	2 less	.....	.....	Yes	Y
22	Allegan	120	100	Clay loam	Dairying, wheat	8-16	2	K	3½	1 qt.	No	No	1, 2, 3, 8, 18, 23	6	3	Do more work	Yes	.....
23	Wexford	200	130	Gravel, sand and clay	Potatoes, oats and wheat	8-16	2	K	4	1 pt.	No	No	1, 2, 3, 8, 9, 16, 23	4	4	Do work better	Yes	Y
24	Saginaw	80	80	Clay	Hay, oats, wheat	10-20	3	K	4	1 qt.	No	No	1, 2, 3, 8	.....	.....	.....	Yes	.....
25	Branch	610	485	Sandy loam	Wheat	8-16	2	K	2½	.....	Lacks trac-tion power	No	1, 2, 8, 9, 22, 23	12	8	25% less	Yes	Y
26	Mason	408	270	Clay loam	Wheat and peas	8-16	2	K	4	1 qt.	No	No	1, 3, 8	6	6	Some less	Yes	Y
27	Van Buren	600	....	Prairie	Wheat	8-16	2	K	3	.....	Need more power	No	1, 2, 3, 8, 10, 18, 23	12	12	Same	Yes	.....
28	Allegan	1420	1420	Muck	Corn, mint, hay	30-60	10	G	.....	.....	No	No	1, 3, 7, 11	45	30	.....	Yes	Y
29	Kent	135	102	Sand, clay	Melons and beans	8-16	2	K	.....	.....	Lacks trac-tion power	No	1, 3, 4, 7, 8, 9, 17, 20	4	4	Same	.....	.....
30	Ontonagon	200	80	Clay	Wheat, oats, peas and hay	8-16	2	K	3½	1 qt.	No	No	1, 2, 3, 10, 11, 22	4	2	.....	Yes	.....

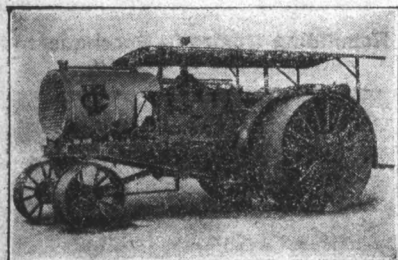
*Numbers in this column refer to the different kinds of work done by tractors as follows: 1—Plowing. 2—Discing. 3—Harrowing. 4—Rolling. 5—Cultivating. 6—Sowing. 7—Grading. 8—Digging. 9—Sawing wood. 10—Grinding feed. 11—Threshing grain and hulling clover. 12—Cutting corn and elevating fodder onto wagons. 13—Operating silos and shredding. 14—Sawing wood. 15—Grinding feed. 16—Husking corn. 17—Spreading manure. 18—Harvesting grain. 19—Lifting roots. 20—Pulling stumps and trees. 21—Digging potatoes. 22—Rolling.



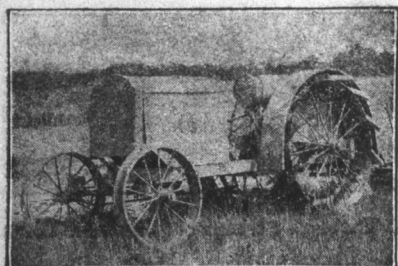
Best.



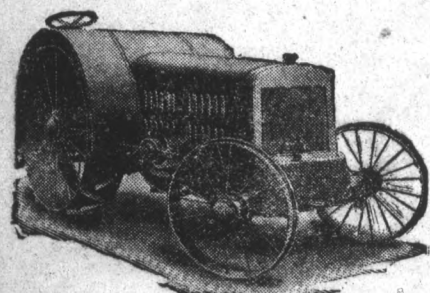
Bates Steel Mule.



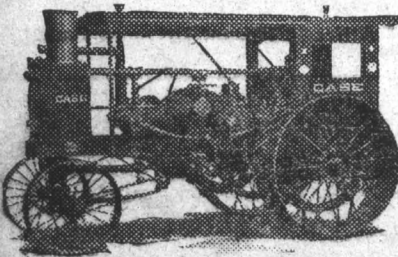
T. C. 60.



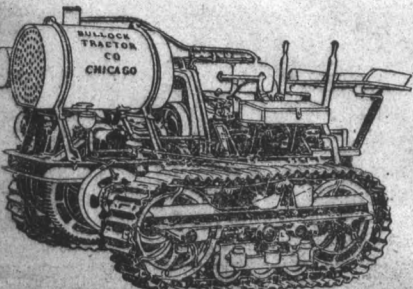
Plow Man.



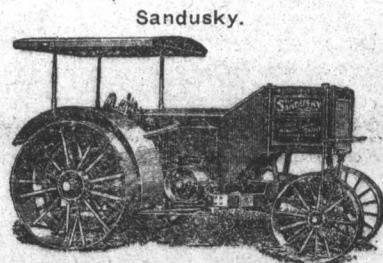
Little Grant.



Case.



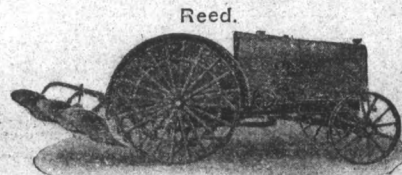
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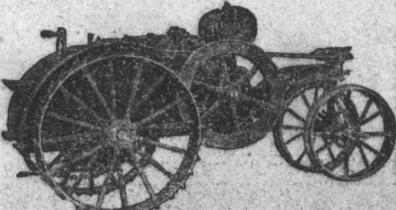
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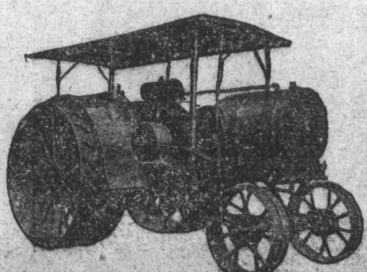
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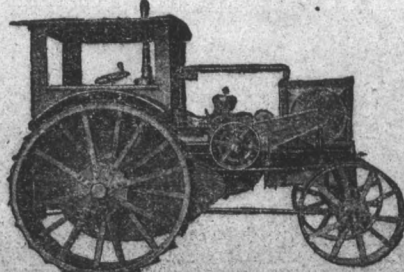
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International.



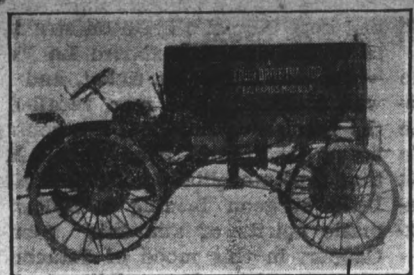
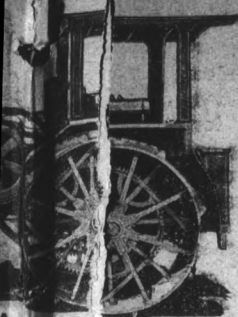
Aultman Taylor.



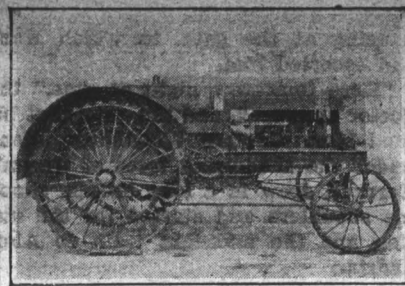
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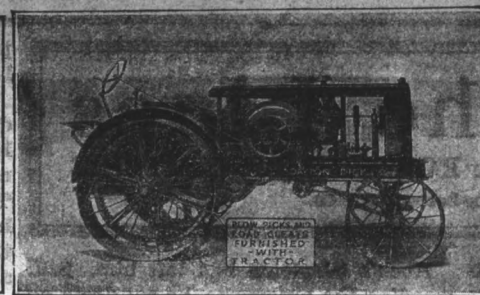
All Work.



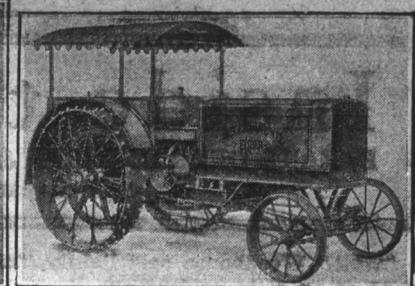
Four Drive.



Heider.



Leader.



Heider.

Michigan Tractor Users.

The varying needs of the farmers of the state The Michigan Farmer has brought together the information in the following tabulation. Where spaces are blank no answers were

Can You Keep up with Better Crop Results?	How Many Acres do You Plow with Tractor?	Do You Plow Deeper with Tractor?	Do You Fit the Soil Better?	What Have Your Repair Bills Amounted to This Year?	Number Days Tractor Used this Season—Estimated?	How Many Years do You Estimate Your Tractor Will Last?	Do You do Custom Work?	Do You Operate Your Own Tractor?
Yes	10	Yes	Yes	\$50.00	4	No	No	No
Yes	7 1/2	No	.....	.....	5	No	Yes	.....
Yes	4	No	No	.....	.....	No	No	.....
Yes	8	Yes	Yes	None	.....	No	Yes	.....
Yes	.....	Yes	Yes	\$65.00	.....	No	.....	.....
Yes	5-7	No	No	7.50	30	10	Yes	No
Yes	4	No	Yes	None	50	10	Yes	Yes
Yes	7	Yes	Yes	5.00	.....	5	No	Yes
Yes	.....	Yes	Yes	None	.....	No	No	.....
Yes	4	Yes	Yes	None	.....	5	No	Yes
Yes	5	Yes	Yes	10.00	.....	5	No	Yes
Yes	10	.....	Small	.....	No	P't	.....	.....
Yes	5	Yes	Yes	25.00	.....	No	.....	No
Yes	6-10	Yes	Yes	12.50	.....	No	No	.....
Yes	5-7	.....	None	.....	5	No	Yes	.....
Yes	4-10	Yes	Yes	\$350.00	35	5	No	No
Yes	4	Yes	Yes	\$8.65	.....	No	Yes	.....
Yes	4-5	Yes	Yes	\$50.00	40	.....	Yes	No
Yes	5-6	Yes	.....	None	.....	10	Yes	Yes
Yes	5	Yes	Yes	\$6.00	.....	5	Yes	Yes
Yes	4-6	Yes	Yes	\$5.00	100	10	Yes	Yes
Yes	4	Yes	Yes	\$20.00	90	10	Yes	Yes
Yes	4-5	Yes	Yes	\$0.10	44	5	Yes	Yes
Yes	6	No	Yes	Small	.....	.....	Yes	Yes
Yes	5	No	.....	\$40.00	60	10	No	Yes
Yes	5	Yes	Yes	None	25	10	No	Yes
Yes	5	No	Yes	\$50.00	65	3-4	No	No
Yes	25	Yes	Yes	\$175.00	100	.....	No	No
Yes	4	Yes	Yes	\$10.00	60	.....	Yes	Yes
Yes	3	Yes	Yes	None	100	.....	No	Yes

Abbreviated replies to the question: "What do you find to be the principal advantages and disadvantages to the farmer, of tractors from your experience with them?"

Get work done when ground is in condition—Save man and horse labor—Adaptable to wide range of service.

Clutch slipped and could not be remedied—Can save time and labor and have more time to get ground properly fitted for seeding or planting.

Fail to secure proper traction. Find machine O. K. for belt work, but not dependable for field service.

Feel satisfied that tractor is an economical source of farm power.

Tractor makes me quite independent of labor. In hot days on sandy soil dust would hover about tractor and out cylinders. On steep side hills it is difficult to work tractor. Have been unable to adjust for cultivating hood crops.

Can rush work. Tractor ought to displace at least one team to make it a good investment.

Reduces cost. Can rush work. Should have work enough to keep the tractor and a few horses busy, as one cannot dispense with all horses. Small farmer can do custom work and make tractor pay.

Difficult to secure good operator. Tractor helps farmer to concentrate his work.

Saves time. Can rush work. Does not work on side hills,—tractor has tipped over twice.

Can rush work. Provides farmer with belt power. Not always dependable.

Can work it night and day. Repair service of companies should be improved to prevent long delays for repairs in busy seasons.

Mine is a home-made machine. Have never farmed before using tractor, so could not make comparisons.

Can rush work. Gives one belt power. Tractor will work on bottom lands where horses would be mired.

Have used tractor 4 years with total repair bills amounting to \$50. Doing better work this year than it did the first. Can handle it better now because of experience.

Have much to learn about operating the tractor. Season unfavorable. Find machine cannot handle four plows well in our soil.

Difficult to get good operators. Think repair bills are too high.

Cannot till wet ground. Can hurry work, especially in hot weather. Does better work and provides farmer with belt power. Because of the wet spring no just comparison with normal years can be made.

Difficult to use during past wet spring. Does good work where soil is in condition. Think repairs are high.

Relieves the horses of the heaviest work. Past season has been an extreme one for any motive power.

The work is done more quickly with less man labor. One man and tractor will do more than two men and 6 horses.

Use tractor 16 hours a day when rushed. Tractor is no good on hilly land.

Work done more quickly and better. Have had trouble getting repair service.

Works fine on level ground, but no good on hills. Does as much or more than four good horses would and is less care.

Is a great help in keeping the work up to date.

Furnishes steady power. Excellent in hot weather. On plowed ground dust sometimes settles about machine and gets into working parts. Very satisfactory for loading hay.

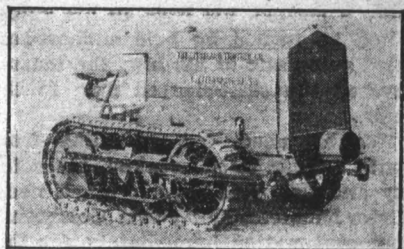
Independent of help. Saves horses on heavy work. Was able to get over 70 acres wheat in which would not have been done with horses.

Think tractor too expensive for the work it does. Excellent for fitting soil for seeding.

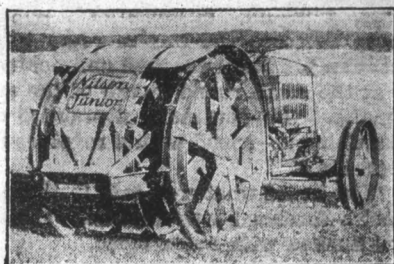
Can rush work in busy season without expense of feeding when there is less to do. Use 6 four-horse disks behind tractor.

On barren, sandy soil wheels slip but if ground is covered with rye or clover all goes O. K. Think tractor handiest thing on farm.

Fits fields quicker and does more thorough work. Can do heavy work in hot weather.



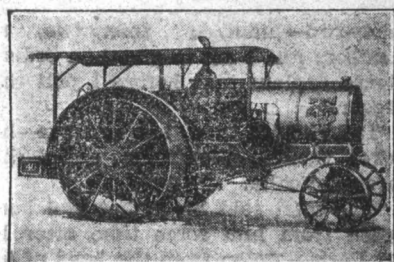
Cleveland.



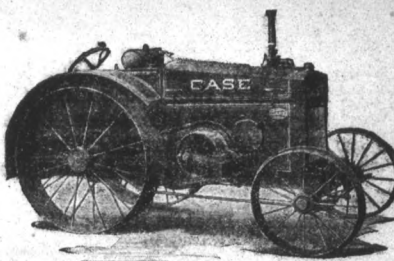
Wilson.



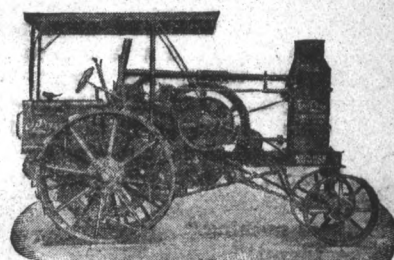
Best.



Twin City.



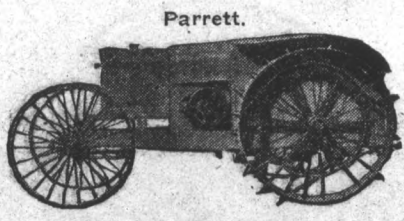
Case.



Oil Pull.



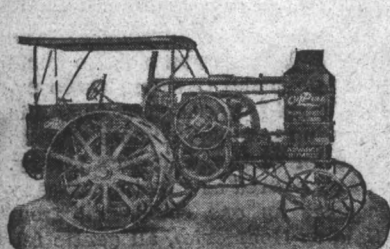
International.



Parrett.



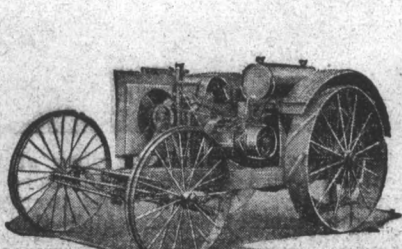
Happy Farmer.



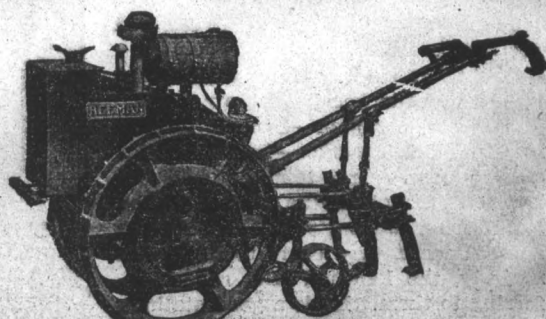
Oil Pull.



Case.



Huber.



Beeman.

6—Renovating alfalfa. 7—Hauling. 8—Filling cement mixer. 14—Shelling corn. 15—Grading hay. 23—Loading hay with loader.

Inside the Lines

By EARL DERR BIGGERS & ROBERT WELLES RITCHIE

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"Well," Woodhouse said lightly, "no need of an alibi evidently." Doctor Koch stepped into the room with the lightness of a cat, walked to a desk drawer at one side, and fumbled there a second, his back to his guest. When he turned he held a short-barreled automatic at his hip; the muzzle covered the shirt-sleeved man in the chair.

"Much need—for an alibi—from you!" Doctor Koch croaked, his voice dry and flat with rage. "Much need, Mister Nineteen Thirty-two. Commence your explanation immediately, for this minute my temptation is strong—very strong—to shoot you for the dog you are."

"Is this—ah, customary?" Woodhouse twiddled the tiny mercury tube between his fingers looked unflinchingly at the small round mouth of the automatic. "Do you make a practice of consulting a—friend with a revolver at your hip?"

"You heard what was said in there," Koch's forehead was curiously ridged and flushed with much blood.

"Did you ask me to listen? Surely, my dear Doctor, you have provided doors that are sound-proof. If I may suggest, isn't it about time that you explained this—this melodrama?" The captain's voice was cold; his lips were drawn to a thin line. Koch's big head moved from side to side with a gesture curiously like that of a bull about to charge, but knowing not where his enemy stands. He blurted out:

"For your information, if you did not overhear: An Englishman comes just now to address me familiarly as of the Wilhelmstrasse. He comes to say he was sent to report to me; that his number in the Wilhelmstrasse is nineteen thirty-two—nineteen thirty-two, remember; and I am to give him orders. Please explain that before I pull this trigger."

"He showed you his number—his ticket, then?" Woodhouse added this parenthetically.

"The man said his ticket had been stolen from him some time after he left Paris—stolen from the head of his cane, where he had it concealed. But the number was nineteen thirty-two." The doctor voiced this last doggedly.

"You have, of course, had this man followed," the other put in. "You have not let him leave this house alone."

"Caesar was after him before he left the garden gate—naturally. But—"

Woodhouse held up an interrupting hand.

"Pardon me, Doctor Koch; did you get this fellow's name?"

"He refused to give it—said I would not know him, anyway."

"Was he an undersized man, very thin, sparse hair, and a face showing dissipation?" Woodhouse went on. "Nervous, jerky way of talking—fingers to his mouth, as if to feel his words as they come out—brandy or wine breath? Can't you guess who he was?"

"I guess nothing."

"The target!"

At the word Louisa had used in describing Capper to Woodhouse, Koch's face underwent a change. He lowered his pistol.

"Ach!" he said. "The man they are to arrest. And you have the number."

"That was Capper—Capper, formerly of the Belgian office—kicked out for drunkenness. One time he sold out Downing Street in the matter of the Lord Fisher letters; you remember the scandal when they came to light—his majesty, the kaiser's, Kiel speech referring to them. He is a good stalking horse."

Koch's suspicion had left him. Still gripping the automatic, he sat down on the edge of the operating chair, regarding the other man respectfully.

"Come—come, Doctor Koch; you and I can not continue longer at cross-purposes." The captain spoke with tense displeasure. "This man Capper showed you nothing to prove his claims, yet you come back to this room and threaten my life on the strength of a drunkard's bare word. What his mission is you know; how he got that number, which is the number I have shown you on my ticket from the Wilhelmstrasse—you understand how such things are managed. I happen to know, however, because it was my business to know, that Capper left Marseilles for Malta aboard La Vendee four days ago; he was not expected to go beyond Malta."

Koch caught him up: "But the fellow told me his boat didn't stop at Malta—was warned by wireless to proceed at all speed to Alexandria, for fear of the Breslau, known to be in the Adriatic." Woodhouse spread out his hands with a gesture of finality.

"There you are! Capper finds himself stranded in Alexandria, knows somehow of your position as a man of the Wilhelmstrasse—such things can not be hid from the underground workers; comes here to explain himself to you and excuse himself for the loss of his number. Is there anything more to be said except that we must keep a close watch on him?"

The physician rose and paced the room, his hands clasped behind his back. The automatic bobbed against the tails of his long coat as he walked. After a minute's restless striding, he broke his step before the desk, jerked open the drawer, and dropped the weapon in it. Back to where Woodhouse was sitting he stalked and held out his right hand stiffly.

"Your pardon, Number Nineteen Thirty-two! For my suspicion I apologize. But, you see my position—a very delicate one." Woodhouse rose, grasped the doctor's hand, and wrung it heartily.

"And now," he said, "to keep this fellow Capper in sight until the Princess Mary sails and I aboard her as Captain Woodhouse, of Vady Halfa. The man might trip us all up."

"He will not; be sure of that," Koch growled, helping Woodhouse into his coat and leading the way to the folding doors. "I will have Caesar attend to him the minute he comes back to report where Capper is stopping."

"Until when?" the captain asked,

pausing at the gate, to which Koch had escorted him.

"Here tomorrow night at nine," the doctor answered, and the gate shut behind him. Captain Woodhouse, alone under the shadowing trees of Queen's Terrace, drew in a long breath, shook his shoulders and started for the station and the midnight train to Alexandria.

CHAPTER V.

A Ferret.

CONSIDER the mental state of Mr. Billy Capper as he sank into a seat on the midnight suburban from Ramleh to Alexandria. Even to the guard, unused to particular observation of his passengers save as to their possible propensity for trying to beat their fares, the bundle of clothes surmounted by a rusty brown bowler which huddled under the sickly light of the second-class carriage bespoke either a candidate for a plunge off the quay or a "bloomer" returning from his wassailing. But the eyes of the man denied this latter hypothesis; sanity was in them, albeit the merciless sanity that refuses an alternative when fate has its victim pushed into a corner. So submerged was Capper under the flood of his own bitter cogitations that he had not noticed the other two passengers boarding the train at the little tiled station—a tall, quietly dressed white man and a Numidian with a cloak thrown over his white livery. The latter had faded like a shadow into the third-class carriage behind the one in which Capper rode.

Here was Capper—poor old Hard-luck Billy Capper—floored again, and just when the tide of bad fortune was on the turn; so ran the minor strain of self-pity under the brown bowler. A failure once more, and through no fault of his own. No, no! Hadn't he been ready to deliver the goods? Hadn't he come all the way down here from Berlin, faithful to his pledge to Louisa, the girl in the Wilhelmstrasse, ready and willing to embark on that important mission of which he was to be told by Doctor Emil Koch? And what happens? Koch turns him into the street like a dog; threatens to have him before the military as a spy if he doesn't make himself scarce. Koch refuses even to admit he'd ever heard of the Wilhelmstrasse. Clever beggar! A jolly keen eye he's got for his own skin; won't take a chance on being betrayed into the hands of the English, even when he ought to see that a chap's honest when he comes and tells a straight story about losing that silly little bit of paper with his working number on it. What difference if he can't produce the ticket when he has the number pat on the tip of his tongue and is willing to risk his own life to give that number to a stranger? Back upon the old perplexity that

had kept Capper's brain on strain ever since the first day aboard La Vendee—who had lifted his ticket, and when was it done? The man recalled, for the hundredth time, his awakening on board the French liner—what a horror that first morning was, with the ratty little surgeon feeding a fellow aromatic spirits of ammonia porridge! Capper, in this mood of detached review, saw himself painfully stretching out his arm from his bunk to grasp his stick the very first minute he was alone in the stateroom; the crooked handle comes off under his turning, and the white wisp of paper is stuck in the hollow of the stick. Blank paper!

Safe as safe could be had been that little square of paper Louisa had given him with his expense money, from the day he left Berlin until—when? To be sure, he had treated himself to a little of the grape in Paris and, maybe, in Marseilles; but his brain had been clear every minute. Oh, Capper would have sworn to that! The whole business of the disappearance of his Wilhelmstrasse ticket and the substitution of the blank was simply another low trick the Capper luck had played on him.

The train rushed through the dark toward the distant prickly coral bed of lights, and the whirligig of black despair churned under the brown bowler. No beginning, no end to the misery of it. Each new attempt to force a little light of hope into the blackness of his plight fetched up at the same dead wall—here was Billy Capper, hired by the Wilhelmstrasse, after having been booted out of the secret service of England and Belgium—given a show for his white alley—and he couldn't move a hand to earn his new salary. Nor could he go back to Berlin, even though he dared return with confession of the stolen ticket; Berlin was no place for an Englishman right now, granting he could get there. No, he was in the backwash again—this time in this beastly half-caste city of Alexandria, and with—how much was it now?—with a beggarly fifteen pounds between himself and the beach.

Out of the ruck of Capper's sad reflections the old persistent call began to make itself heard before ever the train from Ramleh pulled into the Alexandria station. That elusive country of fountains, incense and rose dreams which can only be approached through the neck of a bottle spread itself before him alluringly, inviting him to forgetfulness. And Capper answered the call.

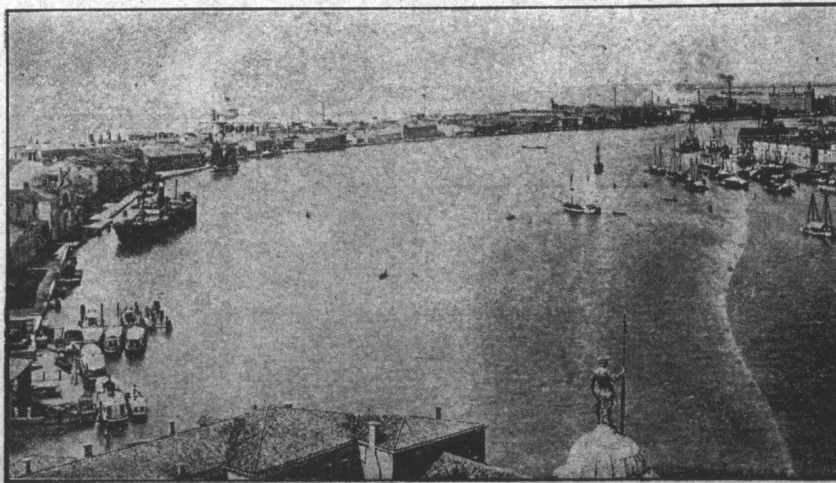
From the railroad station, he set his course through narrow, villainous streets down to the district of Pharos, where the deep-water men of all the world gather to make vivid the nights of Egypt. Behind him was the faithful shadow, Caesar, Doctor Koch's man. The Numidian trailed like a panther, slinking from cover to cover, bending his body as the big cat does to the accommodations of the trail's blinds.

Once Capper found himself in a blind alley, turned and strode out of it just in time to bump heavily into the unsuspected pursuer. Instantly a hem of the Numidian's cloak was lifted to screen his face, but not before the sharp eyes of the Englishman had seen and recognized it. A tart smile curled the corners of Capper's mouth as he passed on down the bazaar-lined street to the Tavern of Thermopylae, at the next corner. So old Koch was taking precautions, eh? Well, Capper, for one, could hardly blame him; who wouldn't, under the circumstances?

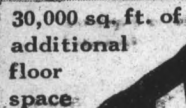
The Tavern of Thermopylae was built for the Billy Cappers of the world—a place of genial devilry where every man's gold was better than his name, and no man asked more than to see the color of the stranger's money. Here was gathered as sweet a company of assassins as one could find from Port Said to Honmouko, all gentle fel-

(Continued on page 23)

Harbor of Venice



This picture gives a panoramic view of the harbor of the world's historic art center which is now being menaced by the Teutonic armies operating in northern Italy. Venice is about twenty-five miles from the river Piave which marks the general front on which the Teutons and Allies are now fighting. Much of the territory to the immediate north of the Gulf of Venice has been flooded by the Italians through the opening of dykes.



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Complete Tractor Course Now a Part of Auto Course

INTERNATIONAL HARVESTER COMPANY
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(Incorporated)
Harvesters and Other Lines of Machinery
Harvester Building.

Chicago, November 20, 1917.

Mr. A. G. Zeller, President,
Michigan State Auto School,
Detroit, Mich.

Detroit, Mich.

Dear Mr. Zeller:—After a very careful examination of your school, we are satisfied that it will be a very wise thing for us to co-operate with you. We are therefore placing in your hands for instruction purposes one of our Titan 10-20 tractors, together with an engine completely equipped for block test and a complete transmission.

Yours very truly,
The Detroit School Board

With you in the excellent

We are ready to co-operate with you in the excellent work you are doing, by giving your school all the data and information not only on tractors, but on conditions generally that can be used in developing thoroughly practical, efficient tractor operators and mechanics.

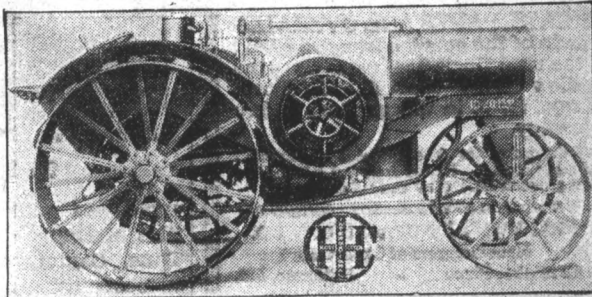
Your practice of co-operating with the factories is very commendable, for it brings together the biggest men and most successful ideas to be had. As you know, there is an urgent demand for tractor men who are trained and efficient. War has taken thousands of men from the farms, and these will have to be replaced, and thousands more will be needed to care for the big crop increases.

We will gladly co-operate with the Michigan State Auto School through our ninety branches in the United States in placing your tractor graduates. There is a constant demand for competent trained tractor men, at very good wages.

Very truly yours,
International Harvester Company of America.
Signed by F. W. Heiskell, Advertising Manager.

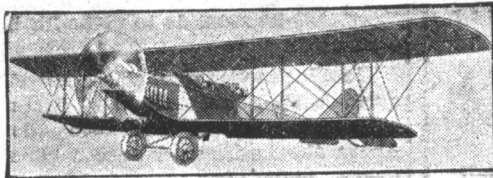
With the co-operation of one of the largest tractor manufacturers in the world, the International Harvester Co., we have arranged a complete course in the care, repair, maintenance and operation of the farm tractor. This course is now taught to students taking the complete Auto Course. It is not a make-shift course but is complete in every respect. Students will be given instructions in operating the I. H. C. Titan Tractor under actual working conditions. They will do actual work. The Titan 10-20 uses kerosene and operates at a very low expense. It has a special kerosene carburetor with many big improvements. The Titan 10-20 has become popular wherever used and has had a big sale.

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The Submarine

By EARL W. GAGE

THE submarine, which we take so much interest in reading about, is the invention of a poor American sailor boy. Many think that it is a new war machine, but it was invented during the Revolutionary War by Captain David Bushnell of the Continental Army, and made its first appearance in warfare in 1775. It is considered the most formidable of all modern naval weapons, and, of course, has been greatly changed from its original form, though working on the same general principles.

Alexander the Great was very much interested in the submarine, and it is known that this form of warfare was known six and seven centuries ago, for under-sea attacks are recorded as being made against vessels. It is a matter of record that in 1727 there were fourteen different types of submarine patented in the London patent office. In 1774 experiments were held with a type which the naval engineers hoped would prove successful. This was held off the coast of Plymouth, England.

But all of the various attempts to travel under water and carry a load of

der for a submarine boat, known as the "Holland" type.

Not until 1906 did the Germans build submarines, for not until then did their naval engineers recognize in this boat the most formidable sea enemy. Today they have perfected large submarines, more commonly called U-boats, which have a cruising radius of from 4,000 to 8,000 miles. A part of the submerging tanks are used to carry the fuel oil for the trip, while provision is made for carrying from four to eight torpedo tubes and long range guns, which are known to be effective at a distance of 8,000 yards. These monster ships of the deep may be successfully submerged from 1,500 to 2,000 feet below the sea's surface, and have a displacement of from 650 to 1,000 tons. On the surface they can travel from seventeen to 19 knots per hour, while submerged they attain speeds as high as 14 to 15 knots per hour. They are about 400 feet in length over all, and carry crews of from forty to fifty men and officers.

Modern submarines are kept on an even keel by ballast tanks and horizon-

they come close enough to be seen, they are quickly submerged until only the periscope is visible.

Figures are not to be had on the latest record for submerging depth, as improvements are being made almost daily in American, English, French and German naval yards. But if any submarine submerges to too great a depth, the heavy pressure of water would not permit coming to the surface again. For this reason, no matter how large or powerful the boat may be, the commander seldom submerges his boat below a level where the periscope can be used, except when in close quarters, when the boat may be submerged low enough to permit the periscope to pass underneath a battleship or vessel. The latest submarine it is believed can submerge a distance of forty feet, but at that depth they are helpless as the periscope cannot be used.

INSIDE THE LINES

(Continued from page 22).

lows of their craft under the freemasonry of hard liquor. Greeks, Levantines, Liverpool lime-juicers from the Cape, leech-eyed Finns from a Russian stokehole, tanned ivory runners from the forbidden lands of the African back country—all that made Tyre and Sidon infamous in Old Testament police records was represented there.

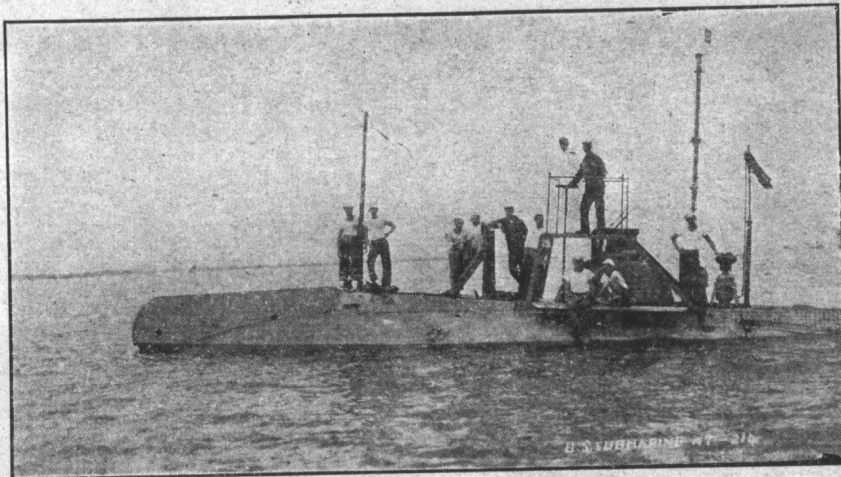
Capper called for an absinth dripper and established himself in a deserted corner of the smoke-filled room. There was music, of sorts, and singing; women whose eyes told strange stories, and whose tongues jumped nimbly over three or four languages, offered their companionship to those who needed company with their drink. But Billy Capper ignored the music and closed his ears to the sirens; he knew who was his best cup companion.

The thin green blood of the wormwood dripped down on to the ice in Capper's glass, coloring it with a rime like moss. He watched it, fascinated, and when he sipped the cold sickly-sweet liquor he was eager as a child to see how the pictures the absinth drew on the ice had been changed by the draft. Sip—sip; a soothing numbness came to the tortured nerves. Sip—sip; the clouds of doubt and self-pity began to shred away. He saw things clearly now; everything was sharp and clear as the point of an icicle.

He reviewed, with new zest, his recent experiences, from the night he met Louisa in the Cafe Riche up to his interview with Doctor Koch. Louisa—that girl with the face of a fine animal and a heart as cold as carved amethyst; why had she been so willing to intercede for Billy Capper with her superiors in the Wilhelmstrasse and procure for him a number and a mission to Alexandria? For his information regarding the Anglo-Belgian understanding? But she paid for that; the deal was fairly closed with three hundred marks. Did Louisa go further and list him in the Wilhelmstrasse out of the goodness of her heart, or for old memory's sake? Capper smiled wryly over his absinth. There was no goodness in Louisa's heart, and the strongest memory she had was how nearly Billy Capper had dragged her down with him in the scandal of the Lord Fisher letters.

How the thin green blood of the wormwood cleared the mind—made it leap to logical reasoning!

Why had Louisa instructed him to leave Marseilles by the steamer touching at Malta when a swifter boat scheduled to go to Alexandria direct was leaving the French port a few hours later? Was it that the girl intended he should get no farther than Malta; that the English there should—Capper laughed like the philosopher who has just discovered the absolute of life's futility. The ticket—his ticket from the Wilhelmstrasse which Louisa had procured for him; Louisa wanted that for other purposes, and used him



On Board a U. S. Submarine Somewhere in the Pacific.

explosives sufficient to throw projectiles at ships were destined to failure. Thus, Captain Bushnell was first to successfully master the art of under-sea ships, and was also first to operate such a boat. With Sergeant Lee of the Continental Army, an attack was made on the British war ship, "H. M. S. Eagle," in New York harbor in 1775. This was a complete failure so far as doing damage to the enemy ship was concerned, but it greatly frightened the Englishmen, and helped to show the young American inventor some of the things he must do to make his boat a success.

The Bushnell submarine was of an ovoid shape, with slightly flattened sides, the pointed end being down. Above the hull proper rose a conning tower, built high enough and wide enough for a man's head and shoulders. One man operated the entire boat and submerged it by admitting water into the water hatches until the desired depth was attained, when these were closed. A crude sort of force pump was devised for pumping out the water when it was desired to rise. The boat, which was operated by Captain Bushnell and Sergeant Lee, was sixty-five feet long and was able to submerge to a depth of eighteen feet below water. It was the great talk of the Revolutionary times, more so, in fact, than the modern submarine of larger proportions and more extended field of operation is today.

Robert Fulton, the famous steamship inventor, made several experiments in endeavoring to perfect an under-sea ship, both in France and America, from 1795 to 1812. A number of submarines were built in Europe between 1850 and 1895, all with more or less successful results. In the latter year the United States government placed its first or-

tal rudders. Submerging is done by admitting water to the submerging tanks and the boat is brought to the surface by expelling this water by high-powered compressed air pumps. These boats often lie on the bottom of the sea in harbors where the water is not exceptionally deep. The time required to submerge and emerge depends on the size of the boat, the reserve displacement and the capacity of the ejecting pumping equipment.

Submarine navigation is the most difficult of all naval warfare, and attracts large numbers of red-blooded young Americans who desire to be included in the task which demands a keen, considerate, calm mind. The officers and men of our submarines, as with other navies, are the highest paid men in the service.

The periscope is a long pipe, fitted with a looking glass arrangement at the top, which may be turned about, reflecting the things seen to the commander, who sits before a looking glass in his office in the boat. This is nearly useless at night and in the day time the vision depends upon the weather and the magnifying and transmitting power of the lenses and mirrors. If the periscope is extended too high, the conning tower and upper portion of the submarine becomes a target for enemy patrol boats, while if it rises only a few feet above the sea its range of vision is correspondingly diminished; at six feet elevation the range is only 2.23 miles.

It is impossible to see clearly under the sea's surface, even for a few feet, unless the vessel is absolutely still. When in the presence of the enemy these boats do not run in cruising trim, but in condition called awash with only the conning tower and a small portion of the hull exposed above water. When

as the dummy to obtain it. She wanted it before he could arrive at Malta—and she got it before he left Marseilles. Even Louisa, the wise, had played without discounting the Double O on the wheel—fate's percentage in every game; she could not know the Vendee would be warned from lingering at Malta because of the exigency of war, and that Billy Capper would reach Alexandria, after all.

The green logic in the glass carried Capper along with mathematical exactness of deduction. As he sipped, his mind became a thing high above earth, reviewed the blundering course of Billy Capper's body from Berlin to Alexandria—the poor deluded body of a dupe. With this certitude of logic came the beginnings of resolve. Vague at first and intangible, then, helped by the absinth to focus, was this new determination. Capper nursed it, elaborated on it, took pleasure in forecasting its outcome, and viewing himself in the new light of a humble hero. It was near morning, and the Tavern of Thermopylae was well-nigh deserted when Capper paid his score and blundered through the early-morning crowd of mixed races to his hotel. His legs were quite drunk, but his mind was coldly and acutely sober.

"Very drunk, master," was the report Caesar, the Numidian, delivered to Doctor Koch at the Ramleh villa. The doctor, believing Caesar to be a competent judge, chuckled in his beard. Caesar was called off from the trail.

Across the street from Doctor Koch's home on Queen's Terrace was the summer home of a major of fusiliers, whose station was up the Nile. But this summer it was not occupied. The major had hurried his family back to England at the first mutterings of the great war, and he himself had to stick by his regiment up in the doubtful Sudan country. Like Doctor Koch's place, the major's yard was surrounded by a high wall, over which the fronds of big palms and flowered shrubs draped themselves. The nearest villa, aside from the Koch's across the street, was a hundred yards away. At night an are light, set about thirty feet from Doctor Koch's gate, marked all the road thereabouts with sharp blocks of light and shadow. One lying close atop the wall about the major's yard, screened by the palms and the heavy branches of some night-blooming ghost flower, could command a perfect view of Doctor Koch's gateway without being himself visible.

At least, so Billy Capper found it on the night following his visit to the German physician's and his subsequent communion with himself at the Tavern of Thermopylae. Almost with the falling of the dark, Capper had stepped off the train at Ramleh station, ferried himself by boat down the canal that passed behind the major's home, after careful reconnoitering, discovered that the tangle of wildwood about the house was not guarded by a watchman, and had so achieved his position of vantage on top of the wall directly opposite the gateway of No. 32. He was stretched flat. Through the spaces between the dry fingers of a palm leaf he could command a good view of the gate and of the road on either side. Few pedestrians passed below him; an automobile or two puffed by; but in the main, Queen's Terrace was deserted and Capper was alone. It was a tedious vigil. Capper had no reliance except his instinct of a spy familiar with spy's work to assure that he would be rewarded for his pains. Some sixth sense in him had prompted him to come thither, sure in the promise that the night would not be misspent. A clock somewhere off in the odorous dark struck the hour twice, and Capper fidgeted. The hard stone he was lying on cramped him.

The sound of footsteps on the flagged walk aroused momentary interest. He looked out through his screen of green

and saw a tall well-knit figure of a man approach the opposite gate, stop and ring the bell. Instantly Capper tingled with the hunting fever of his trade. In the strong light from the arc he could study minutely the face of the man at the gate—smoothly shaven, slightly gaunt and with thin lips above a strong chin. It was a striking face—one easily remembered. The gate opened; beyond it Capper saw, for an instant, the white figure of the Numidian he had bumped into at the alley's mouth. The gate closed on both.

Another weary hour for the ferret on the wall, then something happened that was reward enough for cramped muscles and taut nerves. An automobile purred up to the gate; out of it hopped two men, while a third, tilted over like one drunk, remained on the rear seat of the tonneau. One rang the bell. The two before the gate fidgeted anxiously for it to be opened. Capper paid not so much heed to them as to the half-reclining figure in the machine. It was in strong light. Capper saw, with a leap of his heart, that the man in the machine was clothed in the khaki service uniform of the British army—an officer's uniform he judged by the trimness of its fitting, though he could not see the shoulder straps. The unconscious man was bareheaded and one side of his face was darkened by a broad trickle of blood from the scalp.

When the gate opened, there were a few hurried words between the Numidian and the two who had waited. All three united in lifting an inert figure from the car and carrying it quickly through the gate. Consumed with the desire to follow them into the labyrinth of the doctor's yard, yet not daring, Capper remained plastered to the wall.

Captain Woodhouse, sitting in the consultation room with the doctor, heard the front door open and the scuffle of burdened feet in the hall. Doctor Koch hopped nimbly to the folding doors and threw them back. First, the Numidian's broad back, then, the bent shoulders of two other men, both ill dressed, came into view. Between them they carried the form of a man in officer's khaki. Woodhouse could not check a fluttering of the muscles in his cheeks; this was a surprise to him; the doctor had given no hint of it.

"Good—good!" clucked Koch, indicating that they should lay their burden on the operating chair. "Any trouble?"

"None in the least, Herr Doktor," the larger of the two white men answered. "At the corner of the warehouse near the docks, where it is dark—he was going early to the Princess Mary, and—"

"Yes, a tap on the head—so?" Koch broke in, casting a quick glance toward where Captain Woodhouse had risen from his seat. A shrewd appraising glance it was, which was not lost on Woodhouse. He stepped forward to join the physician by the side of the figure on the operating chair.

"Our man, Doctor?" he queried casually.

"Your name sponsor," Koch answered, with a satisfied chuckle; "the original Captain Woodhouse of his majesty's signal service, formerly stationed at Wady Halfa."

"Quite so," the other answered in English. Doctor Koch clapped him on the shoulder.

"Perfect, man! You do the Englishman from the book. It will fool them all."

Woodhouse shrugged his shoulders in deprecation. Koch cackled on, as he began to lay out sponge and gauze bandages on the glass-topped table by the operating chair.

"You see, I did not tell you of this because—well, that fellow Capper's coming last night looked bad; even your explanation did not altogether convince. So I thought we'd have this little surprise for you. If you were an

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Englishman you'd show it in the face of this—you couldn't help it. Eh?"

"Possibly not," the captain vouchsafed. "But what is your plan, Doctor? What are you going to do with this Captain Woodhouse to insure his being out of the way while I am in Gibraltar. I hope no violence—unless necessary."

"Nothing more violent than a violent headache and some fever," Koch answered. He was busy fumbling in the unconscious man's pockets. From the breast pocket of the uniform jacket he withdrew a wallet, glanced at its contents, and passed it to the captain.

"Your papers, Captain—the papers of transfer from Wady Halfa to Gibraltar. Money, too. I suppose we'll have to take that, also, to make appearances perfect—robbery following assault on the wharves."

Woodhouse pocketed the military papers in the wallet and laid it down, the money untouched. The two white aids of Doctor Koch, who were standing by the folding doors, eyed the leather folder hungrily. Koch, meanwhile, had stripped off the jacket from the Englishman and was rolling up the right sleeve of his shirt. That done, he brought down from the top of the glass instrument case a wooden rack containing several test tubes, stoppered with cotton. One glass tube he lifted out of the rack and squinted at its clouded contents against the light.

"A very handy little thing, very handy," Koch was talking to himself as much as to Woodhouse. "A sweet little product of the Niam Niam country down in Belgian Kongo. Natives think no more of it than they would of a water fly's bite; but the white man is—"

"A virus of some kind?" the other guessed.

"Of my own isolation," Doctor Koch answered proudly. He scraped the skin on the victim's arm until the blood came, then dipped an ivory spatula into the tube of murky gelatine and transferred what it brought up to the raw place in the flesh.

"The action is very quick, and may be violent," he continued. "Our friend here won't recover consciousness for three days, and he will be unable to stand on his feet for two weeks, at least—dizziness, intermittent fever, a clouded memory; he'll be pretty sick."

"But not too sick to communicate with others," Woodhouse suggested. Surely—"

"Maybe not too sick, but unable to communicate with others," Doctor Koch interrupted, with a booming laugh. "This time tomorrow night our friend will be well out on the Libyan Desert, with some ungentle Bedouins for company. He's bound for Fezzan and it will be a long way from home without money. Who knows? Maybe three months."

Very deftly Koch bound up the abrasion on the Englishman's arm with

gauze, explaining as he worked that the man's desert guardians would have instructions to remove the bandages before he recovered his faculties. There would be nothing to tell the luckless prisoner more than that he had been kidnapped, robbed and carried away by tribesmen—a not uncommon occurrence in lower Egypt. Koch completed his work by directing his aids to strip off the rest of the unconscious man's uniform and clothe him in a nondescript civilian garb that Caesar brought into the consultation room from the mysterious upper regions of the house.

"Exit Captain Woodhouse of the signal service," the smiling doctor exclaimed when the last button of the misfit jacket had been flipped into its buttonhole, "and enter Captain Woodhouse of the Wilhelmstrasse." Turning he bowed humorously to the lean-faced man beside him. He nodded his head at Caesar; the latter dived into a cupboard at the far end of the room and brought out a squat flask and glasses, which he passed around. When the liquor had been poured, Doctor Koch lifted his glass and squinted through it with the air of a gentle satyr.

"Gentlemen, we drink to what will happen soon on the Rock of Gibraltar!" All downed the toast gravely. Then the master of the house jerked his head toward the unconscious man on the operating chair. Caesar and the two white men lifted the limp body and started with it to the door, Doctor Koch preceding them to open doors. The muffled chug-chugging of the auto at the gate sounded almost at once.

The doctor and Number Nineteen Thirty-two remained together in the consultation room for a few minutes, going over, in final review, the plans that the latter was to put into execution at the great English stronghold on the Rock. The captain looked at his watch, found the hour late, and rose to depart. Doctor Koch accompanied him to the gate, and stood with him for a minute under the strong light from the near-by arc.

"You go direct to the Princess Mary?" he asked.

"Direct to the Princess Mary," the other answered. "She is to sail at five."

"Then God guard you, my friend, on your great adventure." They clasped hands, and the gate closed behind the doctor.

A shadow skipped from the top of the wall about the major's house across the road. A shadow dogged the footsteps of the tall well-knit man who strode down the deserted Queen's Terrace toward the tiled station by the tracks. A little more than an hour later, the same shadow fitted up the gangplank of the Princess Mary at her berth. When the big P. & O. liner pulled out at dawn, she carried among her saloon passengers one registered as "C. G. Woodhouse, Capt. Sig. Service," and in her second cabin a "William Capper." (Continued next week.)

Bumper the White Rabbit

By GEORGE ETHELBERT WALSH

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Bumper Sees His First Black Crow

WHEN Bumper floated away from the mouth of the sewer on his raft, he felt quite jubilant, and a little proud of his achievement. He had escaped the bats successfully, and now he had found a way out of the sewer itself. He was so puffed up by these exploits that he wasn't a bit afraid of what might happen to him on the river.

"This is really much better than being cooped up in the old woman's backyard," he reflected. "Not even Jimsy or Wheelies ever dreamed of such adventures as I've had. My! I feel like a great traveler already."

But when the current of the river

began to draw his raft away from the shore into the middle, his enthusiasm was not quite so great. The stream grew rougher, and little white caps appeared ahead. His raft began to bob up and down, and pretty soon a wave washed over it and wet Bumper's feet.

This made him very uncomfortable, for a rabbit doesn't like wet feet any more than a cat does. He tried to sit up on his hind legs and dry his front paws, but other waves washed over the raft and wet his haunches. He couldn't very well stand on his front paws, and dry his hind ones, so he had to endure the wet and cold.

The river passed through a beautiful

field all aglow with flowers and green grass, but the shore was too far away for Bumper to swim for it. "I'll leave well enough alone," he said, "and stick to my raft."

Then he came to a woods through which the river flowed. It was swampy here, and twigs and tree trunks seemed to grow out of the water long distances from the shore.

"If I can find a tree fallen in the river, I'll hop on it and escape," Bumper reasoned.

He was so absorbed in watching for a chance to escape that he hardly noticed a black shadow hovering over him. Not until it approached very close did he duck his head and look up.

"Caw! Caw!"

It was a big, black crow. Now Bumper had never seen a crow. In fact, he had never seen any of the wild animals of the woods, for it must be remembered that he was born in the city. Of course, he had seen plenty of sparrows, for they live in the cities, and also sewer rats. A few bats had also flown over the old woman's backyard on warm nights hunting insects, and Bumper was more or less acquainted with them.

But a crow! He didn't know what it was. So when the loud, raucous cry assailed his ears, he squatted down on his raft, expecting every minute to be attacked by the black shadow above.

"Caw! Caw!" screamed the bird.

"Mr. Caw! Mr. Caw!" cried Bumper, supposing that was the bird's name. "Good morning! How do you do?"

Now, the crow is very sensitive about his inability to sing. He used to think that cawing was singing until the birds all laughed at him. After that he kept by himself, and very rarely joined the other birds in the woods or fields.

Bumper's calling him by that name very naturally angered him. It was a slight, a slur upon his voice, and he resented it at once. It must be remembered also that the crow had never seen a white rabbit before, and Bumper's appearance floating on the plank had excited the bird's curiosity. White rabbits don't run wild in the woods, and Bumper was almost as much a mystery to the crow as the latter was to the former. All the rabbits Mr. Crow knew were gray or brown, with a white belly and tail, and none of them had pink eyes. So it was quite natural that the black bird should be curious and surprised at the sight of a pure white rabbit, with pink eyes, floating down the river on a raft.

"Caw! Caw!" screamed the crow, flapping his wings so that the wind made by them ruffled Bumper's hair.

"Yes, yes, Mr. Caw. I understand," replied Bumper, getting excited by the nearness of this big, black thing.

"How dare you make fun of me!" cried Mr. Crow, striking the tip of Bumper's ears with his wings. "I'll teach you to laugh at my voice."

With that he struck out with both wings, and nearly upset Bumper from his raft. Frightened by this exhibition of anger, Bumper's teeth chattered, and his voice shook.

"I wasn't making fun of your voice, Mr. Caw," he said. "I think it's a very sweet and pleasant voice. Please don't upset my raft."

The crow, a little mollified by this flattery, circled around the raft, and surveyed the scene below with eyes filled with curiosity.

"What are you, anyway?" he called down at last. "You look like Mr. Rabbit, but I never saw one so white before. What's your name? And what are you doing on that raft?"

"I'm Bumper, the White Rabbit, and—"

"Rabbits are never white, interrupted the crow.

"But I assure you I am."

"Then you're not a rabbit. You're something else."

Bumper smiled and tried to look

pleased. "Would you be something else if you were white?" he asked.

Now this reference to an old fable of the crows touched a sensitive spot. There were white crows, or at least there were rumors of them, and every crow liked to believe the story was true. If one white crow, then why not more? Why shouldn't all crows be white?

"Did you ever see a white crow?" the bird asked.

"Crow! Crow!" stammered Bumper. "Is that your name? I'm sorry, Mr. Crow, I made a mistake. You see, I'm from the city, and crows don't live there."

"No, I should say not—unless the white ones do." He came nearer and showed excitement. "Answer me: Did you ever see a white crow? If all rabbits from the city are white, then maybe that's where the white crows come from."

Now Bumper was learning shrewdness, and he saw right away through the vanity of the bird that had him at his mercy. So, instead of answering directly, he pretended that he knew a great deal more than he did.

"I'm surprised, Mr. Crow," he said, "that you've never been in the city to see for yourself. You really mean to tell me you've never been in the city?"

"Why, no, it's not a place for crows."

"Maybe not for black ones, but white crows are perfectly safe there, the same as white rabbits. I never saw one hurt there."

"Don't men shoot them?"

"No. People don't shoot birds and animals in the city. They're not allowed to carry guns at all. You're really safer than out here in the country."

"But there's nothing to eat in the city—not for crows. Is there?"

"All the white crows I knew were well fed. And the sparrows get plenty. People feed them sometimes in the park. Why, there are squirrels that have all the nuts they can eat, and they don't have to hunt for them."

"White squirrels?" interrupted Mr. Crow, eagerly.

"Did you ever see a white squirrel, Mr. Crow?" asked Bumper, instead of answering this question.

"No, I never did."

"Then," sighing, "I'm afraid there are none."

Mr. Crow wasn't so much interested in white squirrels as in white crows, and he dismissed the matter from his mind. After a pause, he added: "I believe I'll take a trip to the city, if there's no danger. I'd like to visit some of the white crows. It may be if I stay with them in the city, I'll turn white, too."

Bumper didn't want to deceive him, but he was still afraid of him. Instead of answering directly, he asked: "Before you go, Mr. Crow, can't you help me to get ashore? I'm very tired of this raft. You make so much wind with your beautiful wings, I'm sure you could blow me inshore with them."

"Yes, I suppose I could," was the reply. "Well, since you were kind enough to tell me about my relatives in the city, I'll help you."

He began beating his wings violently, and the wind from them nearly blew Bumper off the raft, but the board floated closer and closer to the shore until the rabbit with a hop landed on it, and bade the crow good-bye.

(The sensations that came over Bumper when he meets a fox will be features of next week's story).

MUTTON.

BY LULU G. PARKER.

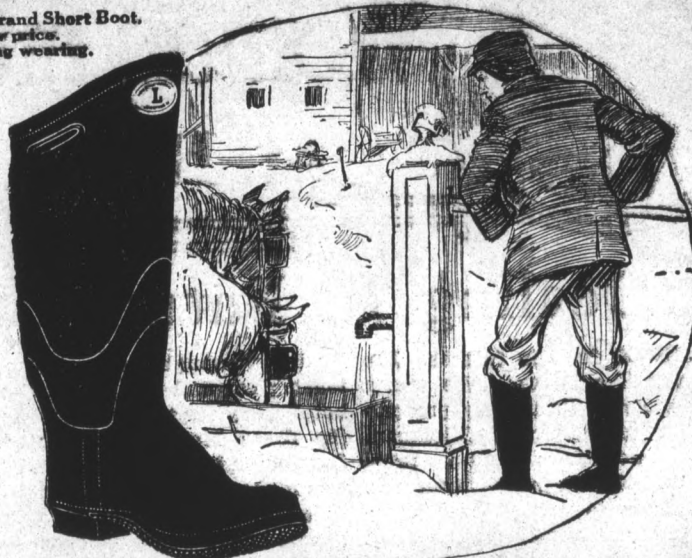
Said Mr. Bo-Peep, "I've lost my sheep, But it does not alarm me; They've gone to help the bill of fare In General Pershing's army."

No instrument of man's devising can reach the heart as does that most wonderful instrument, the human voice.—Hart.

Even when they fail they are entitled to praise.—Macaulay.

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Woman and Her Needs

At Home and Elsewhere



Dealing In Futures

BILL JONES dealt in futures. No. He wasn't a broker. We was a farmer living in a fairly prosperous section of northwest Michigan. Most of his neighbors dealt in presents but Bill believed firmly in futures. His working motto was, "Never do today what you can possibly put off till tomorrow. Next week is even better." In short he was much like the "Arkansas Traveler." He didn't shingle the roof when the sun shone because it didn't need it, and he didn't shingle it when it rained because he couldn't.

Bill had something he called a gate in the barnyard fence. It fell down one day. Bill righted it up, drove a nail or two, and "reckoned that'd do till tomorrow." That night it fell down again. The cattle got out, found the field of corn Bill had managed to put in between showers, ruined that, and then meandered down the road to a neighbor's. This neighbor had had previous troubles with Bill, so he shut up the visiting animals, and Bill had to settle damages before he got his cattle back.

There were one or two pieces of farm machinery, bought on time from a long-suffering dealer. Bill unhooked the horses at night and left it in the field, because he was going to use it next day. He formed habits easily, so when he had finished the field he unhooked the horses and left the implements right where they were, intending to "fix up the shed next week." The season ended before the sheds were fixed and the machinery fell to pieces before it was paid for.

Bill was offered a good price for his potatoes. He promised to start hauling next day. But next day the harness had to be mended, and the day after the much-abused wagon practically fell to pieces with the first load. By the time Bill got the wagon mended and got to town the buyer had got stocked up, and Bill had to peddle his potatoes around the streets for two-thirds of his first offer.

The barn floor was in bad shape. Bill really intended to mend it, but he knew where all the pitfalls were and so kept on dodging them. He hired a city chap to help out in potato digging, and the first day the new man broke through a rotten board and broke his leg. He promptly sued for damages and Bill was out the cost of a new floor, plus a hired man for the fall rush. I could go on and enumerate indefinitely, but what's the use? You can fill out the rest yourself, and I want to give Mrs. Jones her chance.

She dealt in futures, too, but not just Bill's sort. Her most important future was a dress. Mrs. Jones had a dress. In fact she had two. They were of blue and white striped print, made tight in the back and loose in the front, with a belt set in the side seams. One was three inches shorter in the back than it was in the front, and the other "hitched up" at the sides. She always managed to keep two, and washed and ironed one every Saturday afternoon to have it fresh in the hope she might manage to get Bill to "hook up" and drive her to church next day. But she never did. He always promised to go "next Sunday."

Mrs. Jones wanted a real dress, and she knew just she wanted. She saw it one summer when the governor's fam-

ily drove through their country in a big touring car and stopped at the village hotel a day for repairs. A woman wore the dress Mrs. Jones wanted. Mrs. Jones didn't know what sort of stuff it was made of, but it was something soft that you could fold up in a tiny little bundle and it would never wrinkle. She heard the hotel keeper's wife tell that the woman just took it out of her suitcase, where it was wrapped in white tissue paper, gave it a little flirt, and put it on without pressing. And it looked as if she stepped right out of a bandbox. It was a soft, pretty gray, with sleeves you could see through and a little old rose to brighten it up. Mrs. Jones wasn't sure she'd dare wear one like it if she had it, but she wanted it. And she tried to save up to get it.

She got \$2.00 together once, but Johnny needed shoes. And the next time she got a little ahead, Susie had to have flannels. Then there was a third trial, but Bill discovered she had some money, and he found he couldn't farm any longer without a new buggy robe. So it went on. Every time she

had enough ahead to begin to wonder what Miss Perkins, the village dress-maker, would ever think of her, "getting herself up in such style," someone else had to have stockings or shoes or a pair of mittens or school books or a buggy whip and so the new dress continued to be a future, and Mrs. Jones still clung to blue and white wrappers.

She had a new dress one day. But she didn't buy it herself, and it wasn't gray. It was white, and she didn't even know she had it. And she went to church, but she didn't know that, either. The doctor said it was just a general breakdown, but Mrs. Jones would have said she could have kept on going if she'd ever got that gray dress. The neighbors said she looked lovely in the white one, sort of rested and peaceful. They said they couldn't remember when Mrs. Jones hadn't looked fagged. Only when she lay in her coffin that tired look seemed to have passed away.

Bill felt sorry she never got that dress. He really meant she should have it. A discordant squealing in the garden attracted him. The pigs were out again. He'd really have to fix that pen—tomorrow.

DEBORAH.

Planning the Farm Home

By ELLA E. ROCKWOOD

IN no one thing of modern times is the march of progress more clearly illustrated than in our farm homes. It is a far call from the rude log cabin with its one or two rooms in which the family meals were prepared over the big fireplace; and where, in the long winter evenings, the only illumination was furnished by tallow candles, and every convenience we have at the present day, if not actually unheard of at least impossible to attain.

There are so many improved farm houses now that it is almost safe to say that the one which does not possess some claim to being modern is more likely to call for comment, than the one which does. Indeed, there are hundreds of homes scattered over the state from the Ohio line to the Lake Superior shore that possess every convenience of the up-to-date city residence. And of this kind the more the better, for every move in this direction makes for greater ease in housework and in rendering home more attractive to both young and old.

In planning a new house or in remodeling the old one no mere man should attempt to say how the rooms shall be arranged. He has an undisputed right to plan his barns, his hog house, and even the hen house if he chooses, but the family home should be planned by the woman who is to live in it. And while she will very naturally consult with her man, it should be purely in an advisory way. For even the wisest of men, and most indulgent of husbands, knows very little when it comes to arranging doors and windows for the greatest convenience. And upon such little things as cupboards, closets, doors and windows much of the home depends. It is not so much the number of rooms as their relation to one another that counts in the day's

work, and above everything else, ease in doing the work should be considered. While there are many admirers of

the bungalow, it is of doubtful utility as a farm house unless, as the saying is, it spreads all over the ground. The farmer's family is accustomed to too much space to accommodate itself to the modern bungalow, especially where help must be provided for. A large bungalow is hard to heat in winter, and warmer than a two-story house in the summer. The low chambers of the semi-bungalow are then unbearably hot. For these reasons the full two-story house is advisable.

Two things are indispensable in home building today in the rural as in the urban community, and these are furnace heat and running water. It is the universal verdict of all the farm women who have ever come to the city to live that running water and sewer connections in the new home are most appreciated of all conveniences there to be found. Many farm homes now have these and most assuredly the new one must be so supplied. Whether the power comes from windmill, gas engine or other means, it should force an ample supply of pure water through the house for all domestic purposes, including the bath. It seems a strange condition, an uneven distribution of affairs, when the very ones who need a thing most are forced to go without it. This is exactly the case in regard to that essential item, the bath. The wealthy classes have always had it, while the homes of the farmers, because of their isolation, as much as anything else, have gone without. It is one thing in building a house to be able to connect with a public sewer and a public water pipe at one's door, and quite another thing to install such conveniences individually. However, it can be done, and the benefit derived is well worth the price.

When installing a water supply it is quite possible to arrange for a system which will cool an iceless refrigerator in a very satisfactory manner. Many

of the colleges of agriculture have such plans, or application may be made to the Department of Agriculture at Washington. In fact, it would be well to write there for plans for the entire building as the government keeps paid assistants whose business it is to help the farmer, without charge, in solving every problem which may arise. However, the average woman is perfectly capable of planning a home to suit herself, although the chances are that when it is finished she will find some changes which she would like to make.

Formal parlors are not considered so indispensable as they once were, and are often entirely lacking in medium sized homes of the present day. But good large closets, each with a window, are essential. Also plenty of shelves and deep drawers for storing linen and bedding. A closet off the bath room or the upper hall is ideal for this purpose. Wherever its location, the linen closet should be well lighted.

Plenty of windows make an interior pleasant and cheerful, whereas one window to a room can result only in half satisfaction unless the room is very small. Bedrooms especially need two windows each, and if on different sides of the room all the better, as this gives better air in summer when the sleeping rooms are apt to be warm. Broad, easy flights of stairs add to the comfort of the home. Narrow and steep stairs are a torture. That stairs should be well lighted goes without saying. This is provided for nowadays by the window either at the foot of the stairs or at the landing. A ten-inch tread with a six-inch riser makes a stairway which calls for the minimum effort in making the ascent.

There are many beautiful farm homes which combine comfort and convenience. A study of different ones will be of great benefit to the prospective builder. Often ideas will be gained in that way which are of great value. If the home is to be large and somewhat pretentious it will be well to employ an architect, as it is his business to plan buildings. Yet the woman who is to live in it should have the deciding voice in arrangement of rooms and placing of doors, windows, cupboards and closets. A woman architect would never place a kitchen sink at a height of only twenty-six inches from the floor unless for the use of a very short woman. Yet the bottom of the average sink measures no more than that.

It should not be forgotten that in building a home one builds for many years. A few dollars more or less should not stand in the way of making it durable, pleasant, convenient and comfortable, a home to be proud of and to be enjoyed by the entire family.

HOME-MADE HOMINY.

When our grandmothers made hulled corn, hominy, they boiled the shelled corn in a solution of lye made from wood ashes until the hulls came off. The government gives this easier method: "Select sound, white, flint corn. Remove chaff by pouring from one pan to another in a strong breeze. Wash grain thoroughly in water. Then to every pint of corn add one tablespoon of soda, cover with water and soak over night. Drain, wash thoroughly through two waters, rubbing with the hands until the hulls are removed. The

hulls will rise to the top if the corn is allowed to stand, and may then be poured off."

A good grade of yellow corn also makes good hominy. This may be served in many ways. Two old favorites were with whole milk and sugar as a breakfast cereal, or fried in pork drippings and eaten with ham or bacon.

DISHWASHING WITH EASE.

BY GLADYS SOULE.

It is estimated that the average farm woman spends about one-fifth of her energy in washing dishes. When it is taken into account that much of this labor can be easily avoided and still more of it can be done more easily, ways of washing dishes can often be improved upon. As a job, dishwashing is somewhat irksome and there are but few housekeepers who actually like this work.

In the first place, much time can be gained by systematic cleaning of the dishes while at the table. If one will sit down and observe another at the work of clearing up a table, it is evident that much motion is lost. It is not at all uncommon to see the housekeeper make two or three trips to the kitchen that might have been avoided, and all the dishes either taken at once or in two trips at the outside. An ordinary stiff rubber scraper is indispensable for dishwashing. It will remove practically all of the greases and wastes and will not injure the most delicate of china. All the waste and grease may be put on one plate, yet kept separate and when finally emptied the grease should be put into a grease jar kept for that purpose, to be eventually made up into soft soap. The other wastes should be burned or put into a tight garbage can. All similar dishes can be placed together and then the whole piled up with platters on the bottom, large plates next, small plates next, sauce dishes next, and finally the glassware and silverware is kept separate. Then all of this may be taken to the kitchen at once, if the family is not too large.

The equipment of the kitchen can make work easy or burdensome. The sink should be at the right height to make dishwashing comfortable and at one end there should be a slanting drain, this preferably at the left of the sink. This makes for economy of effort, for the dishwasher can hold the dish in the left hand and wash it with the right, thus washing the dish at a single movement instead of passing it from the left hand to the right as is often done.

If the dishes have been well cleaned with the rubber cleaner, one water should be sufficient for the family of ordinary size. Milk dishes should be rinsed in cold water before washing. The usual procedure is to soap the water either with washing powder or soap and the glasses are just rinsed out. The cups are next washed, the saucers next, and so on until all the dishes have been washed and placed on the drain board. If the drain board is made of zinc, the dishes may be scalded here, then covered with a cloth to keep off flies and dust and allowed to dry themselves by the heat of the rinsing water.

The final disposition of the dishes is of great importance. Rather often the good effects of washing are completely undone by the consequent wiping. Clean dishes wiped with a soiled towel can hardly be much better off than they were in the first place. If dishes can be arranged so as to dry by means of the heat of the rinsing water, the labor of wiping is eliminated and the dishes are actually cleaner. If no dish drainer can be secured, an old dish pan with nail holes in the bottom will serve the purpose. So far as possible, the dishes should be placed so that all water can drain away, then the hot rinsing wa-

ter may be poured on, and the dishpan placed over the sink. In fifteen or twenty minutes the dishes may be taken out and put away in the cupboard.

CONSERVATION DAY SUGGESTIONS.

Meatless Day.—Breakfast, hominy and cheese; dinner, fish kedgeree; supper, Spanish beans.

Wheatless Day.—Breakfast, barley muffins; dinner and supper, oat meal and corn meal bread.

Hominy and Cheese.—Put alternate layers of hominy and cheese in a buttered baking dish. Pour over enough milk to come half-way to the top, cover with buttered crumbs, brown and serve piping hot.

Fish Kedgeree.—Wash four tablespoons of rice and drop slowly into fast-boiling salted water. Boil fast until tender, then dry on colander. Boil one egg hard, cool in water and chop coarsely. Melt two tablespoons drippings in a frying pan, stir in the cooked rice, add one and a half cups of flaked, cooked fish, salt and pepper to taste. Stir until the fish is heated, then add the chopped egg and serve at once. If onion flavoring is liked, stir one teaspoon of finely chopped onion in the melted fat and brown before adding rice.

Spanish Beans.—Soak two cups of kidney beans over night. Drain, cover with boiling water and boil slowly until tender. Drain and add sauce made as follows: Put two tablespoons of drippings into a frying pan, add one cup of finely cut onion, one-half cup of chopped pimento, and fry until tender but not brown. Then add two cups of tomato, salt to taste, and two tablespoons of flour dissolved in cold water. Boil five minutes, pour over beans and simmer for ten minutes.

Barley Muffins.—One cup of whole wheat flour, one cup of barley meal, one-fourth teaspoon of salt, two teaspoons of baking powder, one and one-fourth cups sour milk, one-half teaspoon of soda, two tablespoons of lard or beef drippings. Sift flour, barley meal, salt and baking powder. Dissolve soda in a little cold water and add to sour milk. Combine the two mixtures, add egg and melted fat. Bake in moderate oven.

Oat Meal and Corn Meal Bread.—One and a half cups of rolled oats, one and one-fourth cups of corn meal, one-half cup of brown sugar, three and three-fourths cups of flour, two cups of boiling water, two teaspoons of salt, one yeast cake. Dissolve yeast in lukewarm water, pour boiling water over rolled oats and let stand until lukewarm; add dissolved yeast, corn meal and flour. Let rise until light, beat well, let rise again and put in pans. Bake when again light.

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How many cooks have a collection of recipe books sent out by the different food manufacturers? Most of these may be obtained for the trouble of writing and asking for them, though some want a coupon from one of their products, others a few cents to cover postage, and others demand a few labels from their goods.

My collection numbers books from two baking powder companies, two flour manufacturers, a syrup company, two organizations handling fruits, two gelatine manufacturers, a cocoa and chocolate manufacturer, a sugar company and a few others.

A farm implement manufacturing company sends a book on canning; the various soap companies send pamphlets on laundering, with valuable suggestions for removing stains, and a cutlery firm sends a leaflet showing how to set the table properly. There is no reason why every woman should not have quite a collection of helpful hints.



Strength in Flour

The strength of a flour is determined largely by the amount of water it will absorb.

Bread made from a good strong flour will not dry out quickly. The extra amount of water absorbed in the mixing keeps the bread moist and fresh.

If your bread dries out in no time, and you have to bake often and in small batches, it is probably because the flour you use lacks strength.

Bread made from Pillsbury's Best flour stays fresh a long time, because Pillsbury's Best is a strong flour and absorbs lots of water.

The Flour Question Settled
**Because
Pillsbury's Best**

Pillsbury Flour Mills Company, Minneapolis, Minn.



Keep Baby's Skin Soft and Smooth

Always use 20 Mule Team Borax in the baby's bath. It softens and soothes the delicate skin and cleans it hygienically. Opens the pores and lets the skin "breathe". And every other member of your family will find many beneficial uses for



MULE TEAM BORAX

See that it is used in the bath; for a mouth and eye wash and other toilet purposes. It is Nature's greatest cleanser. Costs little, does much. Endorsed by all health authorities. Used wherever hygienic cleanliness must be maintained.

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Send for "Magic Crystal" Booklet. It describes 100 household uses for 20 Mule Team Borax.

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do all the work of washing and wringing, and do it better in one-half the time. You should know all about them.

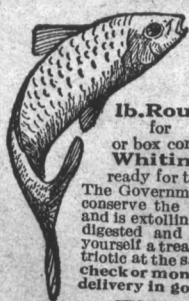
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The Government is asking every one to conserve the meat supply and use fish and is extolling them as healthy, easily digested and nutritive. You can give yourself a treat, save money and be Patriotic at the same time. Send personal check or money order. We guarantee delivery in good condition. Do it Now.

THE RANNEY FISH CO.

Address Parcel Post Dept. CLEVELAND, OHIO

For the Needleworker

Knit Socks for Soldiers

One hank of yarn (1/4 lb.)

Socks must not have a ridge under the heel nor at the end of the toe, nor a back seam stitch.

Do not knit coarse yarn on fine needles.

Do not make double heel.

Break any knots in the wool, and join again by running each end into the other with a darning needle for about six inches.

Always knit loosely.

Always shrink yarn before using.

Always wash the socks carefully before turning them in.

Length of foot when finished—not less than 10 1/2 inches; not over 12 inches.

Medium sizes are required in the

around again to the center heel.

First needle, knit to within 3 stitches of the front end of side needle, knit 2 together, knit 1.

Front needle plain.

Third needle, knit 1, slip 1, knit 1, pull slipped stitch over, knit plain to end of needle.

This reducing to be done every other row until there are 56 stitches on the needles (front needle 28, side needles 14 each).

Knit plain until the foot from the back of the heel measures 8 1/2 inches, or 9 inches for a longer sock.

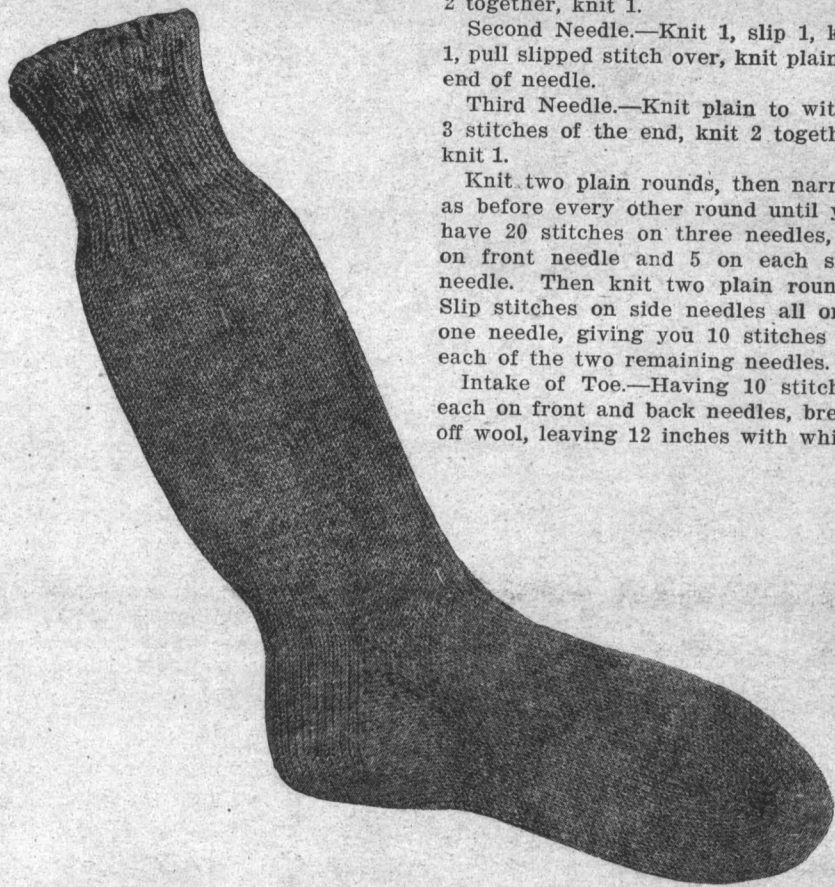
To Narrow for Toe.—Begin at the front needle; knit 1, slip 1, knit 1, pull slipped stitch over, knit plain to within 3 stitches of the end of the needle, knit 2 together, knit 1.

Second Needle.—Knit 1, slip 1, knit 1, pull slipped stitch over, knit plain to end of needle.

Third Needle.—Knit plain to within 3 stitches of the end, knit 2 together, knit 1.

Knit two plain rounds, then narrow as before every other round until you have 20 stitches on three needles, 10 on front needle and 5 on each side needle. Then knit two plain rounds. Slip stitches on side needles all onto one needle, giving you 10 stitches on each of the two remaining needles.

Intake of Toe.—Having 10 stitches each on front and back needles, break off wool, leaving 12 inches with which



largest numbers—foot 11 inches.

Needles—four No. 10 steel, or corresponding size in bone, celluloid or wood. Loosely cast on 56 stitches; 2 plain, 2 purl for 4 inches; knit plain 7 inches (11 inches in all).

Heel—knit plain 28 stitches on to one needle, turn, purl back these 28 stitches, turn, knit plain, repeating these two rows (always slipping the first stitch) for 28 rows, making heel about three inches.

With the inside of the heel toward you, purl 16 stitches, purl 2 together, purl 1.

Turn, knit 6 stitches, slip 1, knit 1, pull slipped stitch over, knit 1, turn, purl 7 stitches, purl 2 together, purl 1.

Turn, knit 8 stitches, slip 1, knit 1, pull slipped stitch over, knit 1, turn, purl 9 stitches, purl 2 together purl 1.

Turn, knit 10 stitches, slip 1, knit 1, pull slipped stitch over, knit 1, turn, purl 11 stitches, purl 2 together, purl 1.

Turn, knit 12 stitches, slip 1, knit 1, pull slipped stitch over, knit 1, turn, purl 13 stitches, purl 2 together, purl 1.

Turn, knit 14 stitches, slip 1, knit 1, pull slipped stitch over, knit 1, turn, purl 15 stitches, purl 2 together.

Turn knit 15 stitches, slip 1, knit 1, pull slipped stitch over.

Now pick up and knit the 14 stitches down the side of the heel piece.

Knit the 28 stitches of the front needles on to one needle. Pick up and knit 14 stitches at the other side of the heel piece. Divide the heel stitches on to the 2 side needles, and knit right

to finish off sock and thread it into a

darning needle. Put darning needle into first stitch of the front knitting needle as if to knit, pull wool through and take off stitch. Put darning needle in next stitch of front needle as if to purl, pull wool through but leave the stitch on. Go to back needle, being particularly careful that the wool is taken under the knitting needle each time and not over. Put the darning needle in first stitch of the back needle as if to purl, pull wool through and take off stitch; put darning needle in next stitch of the back needle as if to knit, pull wool through but leave stitch on. Return to front needle, put wool in first stitch (the one previously purl-ed) and repeat. In finishing off end of yarn, run yarn once down side of toe, so as not to make ridge or lump.

Tie together below ribbing at back of leg.

Leg, from tip of heel to top of leg, not less than 14 inches.

SHORT CUTS TO HOUSEKEEPING.

Melt a bar of laundry soap with a half cup of water and stir in all the sifted hard coal ashes it will take up. Mold in a match box. It makes the best scouring soap. Sift and put away a box of ashes for use in the summer time.—M. A. C.

Enameled cooking dishes may be saved from cracking and chipping off, if, when they are first used, they are thoroughly greased with butter.—M.

The Grizzly King

By JAMES OLIVER CURWOOD

Copyright by Paget Newspaper Service

Ten years before Thor's mother had gone in there to sleep through the winter, and when she waddled out to get her first glimpse of spring three little cubs waddled with her. Thor was one of them. He was still half blind, for it is five weeks after a grizzly cub is born before he can see; and there was not much hair on his body, for a grizzly cub is born as naked as a human baby. His eyes open and his hair begins to grow at just about the same time. Since then Thor had denned eight times in that cavern home.

He wanted to go in now. He wanted to lie down in the far end of it and wait until he felt better. For perhaps two or three minutes he hesitated, sniffing yearningly at the door to his cave, and then feeling the wind from down the gorge. Something told him that he should go on.

To the westward there was a sloping ascent up out of the gorge to the summit, and Thor climbed this. The sun was well up when he reached the top, and for a little while he rested again and looked down on the other half of his domain.

Even more wonderful was this valley than the one into which Bruce and Langdon had ridden a few hours before. From range to range it was a good two miles in width, and in the opposite directions it stretched away in a great rolling panorama of gold and green and black. From where Thor stood it was like an immense park. Green slopes reached almost to the summits of the mountains, and to a point halfway up these slopes—the last timber-line—clumps of spruce and balsam trees were scattered over the green as if set there by the hands of men. Some of these timber-patches were no larger than the decorative clumps in a city park, and others covered acres and tens of acres; and at the foot of the slopes on either side, like decorative fringes, were thin and unbroken lines of forest. Between these two lines of forest lay the open valley of soft and undulating meadow, dotted with its purplish bosks of buffalo willow and mountain sage, its green coppices of wild-rose and thorn, and its clumps of trees. In the hollow of the valley ran a stream.

Thor descended about four hundred yards from where he stood, and then turned northward along the green slope so that he was traveling from patch to patch of the parklike timber, a hundred and fifty or two hundred yards above the fringe of forest. To this height, midway between the meadows in the valley and the first shale and bare rocks of the peaks, he came most frequently on his small game hunts.

Like fat woodchucks the whistlers were already beginning to sun themselves on their rocks. Their long, soft, elusive whistlings, pleasant to hear above the drone of the mountain waters, filled the air with a musical cadence. Now and then one would whistle shrilly and warningly close at hand, and then flatten himself out on his rock as the big bear passed, and for a few moments no whistling would break upon the gentle purring of the valley.

But Thor was giving no thought to the hunt this morning. Twice he encountered porcupines, the sweetest of all morsels to him, and passed them unnoticed; the warm, sleeping smell of a caribou came hot and fresh from a thicket, but he did not approach the thicket to investigate; out of a coulee, narrow and dark, like a black ditch, he caught the scent of a badger. For two hours he travelled steadily northward along the half-crest of the slopes be-

fore he struck down through the timber to the stream.

The clay adhering to his wound was beginning to harden, and again he waded shoulder-deep into a pool, and stood there for several minutes. The water washed most of the clay away. For another two hours he followed the creek, drinking frequently. Then came the capoes oowin—six hours after he had left the clay wallow. The kiani-kinic berries, the soap berries, the jackpine pitch, the spruce and balsam needles, and the water he had drunk, all mixed in his stomach in one big compelling dose, brought it about—and Thor felt tremendously better, so much better that for the first time he turned and growled back in the direction of his enemies. His shoulder still hurt him, but his sickness was gone.

For many minutes after the capoes oowin he stood without moving, and many times he growled. The snarling rumble deep in his chest had a new meaning now. Until last night and today he had not known a real hatred. He had fought other bears, but the fighting rage was not hate. It came quickly, and passed away quickly; it left no growing ugliness; he licked the wounds of a clawed enemy, and was quite frequently happy while he nursed them. But this new thing that was born in him was different.

With an unforgettable and ferocious hatred he hated the thing that had hurt him. He hated the man-smell; he hated the strange, white-faced thing he had seen clinging to the side of the gorge; and his hatred included everything associated with them. It was a hatred born of instinct and roused sharply from its long slumber by experience.

Without ever having seen or smelled man before, he knew that man was his deadliest enemy, and to be feared more than all the wild things in the mountains. He would fight the biggest grizzly. He would turn on the fiercest pack of wolves. But before man he must flee! He must hide! He must constantly guard himself in the peaks and on the plains with eyes and ears and nose!

Why he sensed this, why he understood all at once that a creature had come into his world, a pigmy in size, yet more to be dreaded than any foe he had ever known, was a miracle which nature alone could explain. It was a hearkening back in the age-dimmed mental fabric of Thor's race to the earliest days of man—man, first of all, with the club; man with the spear hardened in fire; man with the flint-tipped arrow; man with the trap and the deadfall, and, lastly, man with the gun. Through all the ages man had been his one and only master. Nature had impressed it upon him—had been impressing it upon him through a hundred or a thousand or ten thousand generations.

And now for the first time in his life that dormant part of his instinct leaped into warning wakefulness, and he understood. He hated man, and hereafter he would hate everything that bore the man-smell. And with this hate there was also born in him for the first time fear. Had man never pushed Thor and his kind to the death the world would not have known him as *Ursus Horribilis* the Terrible.

Thor still followed the creek, nosing along slowly and lumberingly, but very steadily; his head and neck bent low, his huge rear quarters rising and falling in that rolling motion peculiar to all bears, and especially so of the grizzly. His long claws click-clicked along the half-crest of the slopes be-

(Continued on page 33).

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But you can do more than that with the new Evinrude Oil Engine. Built to start and run on kerosene and fuel oils, it operates at a saving of four-fifths on the

cost of fuel. The satisfactory substitution of these low grade and easily obtainable oils for costly gasoline represents a real addition to your farm income. The

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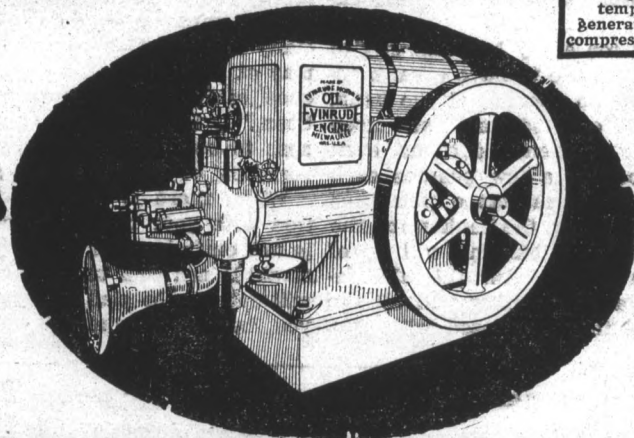
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embodies the most advanced principles of engine construction and workmanship. It is built to stand the hard usage of daily farm demands and every complicated and troublesome device has been eliminated. It does not require an expert operator. Starting readily, even in zero weather, you may depend upon it to run without attention as long as there is fuel in the feed tank. An efficient, dependable and practical farm engine placed in your reach.

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No. 1948—Girl's Overblouse Dress, with Guimpe. Cut in 5 sizes, 4, 6, 8, 10 and 12 years. It requires 1 1/4 yards of 27-inch material for the guimpe, and 3 3/4 yards for the dress, for an eight-year size. Price, 10 cents.

No. 2270—Girls Dress. Cut in 4 sizes, 4, 6, 8, and 10 years. Size 8 requires 3 3/4 yards of 44-inch material. Price, 10 cents.



No. 2046—Ladies' House Dress. Cut in 7 sizes, 34, 36, 38, 40, 42, 44 and 46 inches bust measure. It requires 6 1/2 yards of 44-inch material for a 38-inch size. The skirt measures about 2 3/4 yards at the foot. Price, 10 cents.

No. 2288—Ladies' Negligee. Cut in 4 sizes: Small 32-34; medium 36-38; large 40-42; extra large 44-46 inch-

es bust measure. Size medium requires 7 1/4 yards of 36-inch material. Price, 10 cents.

No. 2283-2282—A Stylish Costume. Waist 2283 cut in 7 sizes, 34, 36, 38, 40, 42, 44 and 46 inches bust measure. Skirt 2282 cut in 7 sizes, 22, 24, 26, 28, 30, 32 and 34 inches waist measure. The skirt measures about three yards at the foot, with plaits drawn out. To make this costume in a medium size will require eight yards of 44-inch material. Two separate patterns, 10 cents for each pattern.

No. 2271—Dress for Misses and Small Women. Cut in 3 sizes, 16, 18 and 20 years. Size 18 will require 4 3/4 yards of 44-inch material. The dress measures about two yards at the foot. Price, 10 cents.



Our Boys and Girls

At Work and play



THINK of this, boys and girls, for every dollar's worth of business done in the world there are but three pennies of actual money. Credit or confidence is the keynote to a business success; so one of the first things I would have you learn, is to establish confidence and maintain it.

Now, confidence is not all covered by the size of one's bank account, not by a long way. I know many poor men doing business on very small capital indeed, who can get credit extension when required and get it readily, even though it be times of stress, simply because they have established themselves in the confidence of the business world by first, not making impossible business contracts to pay, and secondly, by establishing the policy of always keeping their contracts exactly on time or making other arrangements for extension.

It is well for every boy and girl to begin young in life to have a bank account. Open an account at the bank, even if it be ever so small, and keep it alive by frequent additions even though it be but a few pennies each month. The acquaintance you thus gain with the bank, the banker and the business detail of banking will be of great value to you. And this also remember, that the banker will all the time be getting acquainted with you.

How the World's Business Is Transacted - By COMFORT A. TYLER

Confidence a Valuable Asset

This may sometime be of more value to you than any other feature of your effort. Do not think that, because your business is small that the banker is not making mental note of every transaction you make and building his opinion of your business ability and integrity by it.

The question of whom your banker is to be is one of quite material importance. Of course, the bank should be located in reasonably convenient distance, but the personality of the man himself with whom you are to be financially connected, means more than you may at first think, for when you have once established your banking "relations," it is the poorest kind of business to be shifting about without the very best of reasons for so doing.

When there is anything in connection with your banking business, that is not entirely clear to you, do not be afraid to ask your banker about it. He will not only be glad to explain it all to you, but aside from this he will take

pride in the fact that you are interested enough to ask about it.

I believe I speak from knowledge when I say that the average banker today takes as much pride in the financial and other success of his patrons, and especially those young patrons who have been with his institution since their debut in business, as do the patrons themselves. It is a sort of an endorsement for his establishment and I do not believe there is a person in business today that does not feel a little glow of pride in feeling that they have in some way, either directly or indirectly, been instrumental in helping some other person to make the best of their opportunities. If there is such a person he is surely not worthy the name of banker.

This would be a sorry old world indeed, if each lived for self alone, each for himself or herself, taking no interest in their fellow man and the good they can bring to those to whom our help is useful. We have only to look

about us every day in these more than strenuous times to know that the vast majority of the American people are large-hearted, whole-souled, generous people who vie each with the other, to see who can give most of themselves in service to the many. With the numerous demands made upon our time and our purses, the tide of assistance seems never to cease flowing and all that is required to open a new spring of benevolence, is to show that a new and worthy cause is with us, or that additions are required for the old and the response is immediate and certain.

When these demands, or shall I say opportunities, shall come, for it is as such that I prefer to have our boys and girls look upon their helpfulness in times of need, a little bank account will be a great sense of satisfaction to you. There are several methods of starting a bank account, each having its peculiar merits and as our articles proceed we shall try to mention some of the especial merits of each, but this one thing I want to impress on each one of our youth—have a bank account and transact your business through it from your earliest childhood. Learn the use of money and the one best way to handle your business matters and the question of just what kind of a bank account you are to have we will discuss in our next—if we get to it.



Boys' and Girls' Club Notes

Conducted by E. C. Lindemann



Two Interesting Letters

THE following letters from President Wilson and Ex-President Theodore Roosevelt, explain how much these two men realize that the country is dependent upon the boys in this great hour of need. Both letters are about the Boys' Working Reserve. President Wilson's letter was written to the secretary of labor under whose department the Boys' Working Reserve is organized, while Mr. Roosevelt's letter is to Mr. Hall, national director of the association:

President Wilson's Letter.

My Dear Mr. Secretary:

Permit me to express my great appreciation of the work undertaken by the United States Boys' Working Reserve of the Employment Service of the Department of Labor. To give to the young men between the ages of sixteen and twenty-one the privilege of spending their spare time in productive enterprise without interrupting their studies at school, while their older brothers are battling in the trenches and on the seas, must greatly increase the means of providing for the forces at the front and the maintenance of those whose services are needed here. It is a high privilege, no less than a patriotic duty, to help support the nation by devoted and intelligent work in this great crisis.

Let me express the hope that the young men of the country not now permanently employed may eagerly enter the Boys' Working Reserve to fit themselves by training and study for good citizenship and productive service. In this way they can show themselves

worthy of patriotic fathers who have fought for democracy in the past, sustain their patriotic brothers who are fighting for it today, and command the affectionate pride of the brave mothers who are silently bearing the burdens at home.

Cordially and sincerely yours,

WOODROW WILSON.

Mr. Roosevelt's Opinion.

My Dear Mr. Hall:

I wish to express my hearty and unreserved support of what you are doing. You are now actually engaged in meeting the shortage of labor on the farm by the creation of the Working Reserve, to include the boys between the ages of sixteen and twenty-one who ordinarily would not be in productive labor, and who can be turned into workers on the farm. You have shown and the farmer has been prompt to recognize the fact, that the strong healthy boy is a tremendous help at this time and that if this patriotism is appealed to, they will stick to the farm where the need is great, in spite of the offer of higher wages in the city. The training of boys to prepare for some essential industry where they can take the place of a man called to the front is going to be of great benefit to the country.

One of the great benefits you confer is that of making a boy realize that he is part of Uncle Sam's team; that he is doing his share in this great war, that he holds his services in trust for the nation, and that although it is proper to consider the question of material gain and the question of his own de-

sires, yet that what he must most strongly consider at this time is where his services will do most good to our people as a whole. I earnestly wish you every success in your wise and patriotic effort.

Faithfully yours,

THEODORE ROOSEVELT.

Girl Wins Contest

A GIRL, just thirteen years of age, has outdistanced Michigan boys in the raising of winning pullets. A pullet "brought up" by the young lady, who is Miss Deon Jones, of De Witt, has been adjudged the best among the two hundred birds entered by boys and girls in the all-Michigan and poultry contest conducted by the poul-

try department of the Michigan Agricultural College. Two boys did, however, manage to land in second and third places. They are Donald Baker, of Merle Beach, to whom second prize has been presented, and Clayton Olds, of Ypsilanti, third prize winner.

The contest was the first of its kind ever conducted in Michigan, though hereafter it will be made an annual affair. Hoping by enlisting the interest of children in poultry raising to build up this industry in the state, the college last spring secured the names of two hundred boys and girls between the ages of ten and eighteen years. To each of these selected individuals a setting of eggs was sent and from these eggs chicks were hatched, and reared under the direction of advisers

Vocational Training Clubs



These Clubs are coming to be very popular in Michigan. The above picture shows a demonstration in handicraft work. In these clubs the boys learn to make useful articles for the home and farm. Bulletins and instructions are furnished by the Michigan Agricultural College.

connected with the college. Finally, according to the pre-arranged plan, the best pullet from each of these flocks was returned to the college, the first birds arriving about October 1. A sealed band was placed about the leg of each, and when all the birds were in they were judged, with the result mentioned.

The competition, however, is not yet ended, for the pullets will be kept at M. A. C., and during each month for an entire year every bird will be trapped and a record kept of its egg-laying ability. These records for each pullet will begin when its first egg is laid and will continue from that time on for 365 days.

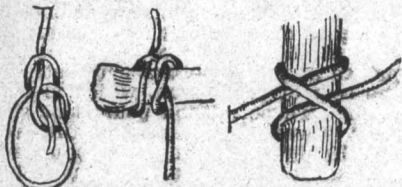
When the year is over another set of prizes will be awarded to the boys and girls whose chickens, as shown by the tally have laid the largest number of eggs.

Finally, in the second year, 1918-1919, the pullets will be bred and a setting of eggs from each hen will be incubated. The chicks from these eggs also, will be reared, and to the boy or girl whose pullet has produced the best-laying pullet among these, a grand sweepstakes prize will be awarded.

The contest, it may be added, is one into which the young people have entered with unbounded interest.

HOW MANY KNOTS CAN YOU TIE?

Every boy should know how to tie at least ten good knots. The above knots are very simple and any boy can learn to tie and use them. No. 1 is a clove



hitch. No. 2 is a picket rope (used to fasten on the end of a short stake or picket) with a half-hitch and granny. No. 3 is a bowline, one of the most useful knots. It never slips and is easily untied.

From time to time we will show how to tie other knots. Besides learning to use these useful knots you may have heaps of fun by holding knot-tying contests.

THE GRIZZLY KING

(Continued from page 31). on the stones; he crunched heavily in the gravel; in soft sand he left enormous footprints.

That part of the valley which he was now entering held a particular significance for Thor, and he began to loiter, pausing often to sniff the air on all sides of him. He was not a monogamist, but for many mating seasons past he had come to find his Iskwa in this wonderful sweep of meadow and plain between the two ranges. He could always expect her in July, waiting for him or seeking him, with that strange savage longing of motherhood in her breast. She was a splendid grizzly who came from the western ranges when the spirit of mating days called; big, and strong, and of a beautiful golden-brown color, so that the children of Thor and his Iskwa were the finest young grizzlies in all the mountains. The mother took them back with her unborn, and they opened their eyes and lived and fought in the valleys and on the slopes far to the west. If in later years Thor ever chased his own children out of his hunting grounds, or whipped them in a fight, nature kindly blinded him to the fact. He was like most grouchy old bachelors: he did not like small folk. He tolerated a little cub as a cross-grained old woman-hater might have tolerated a pink baby; but he wasn't as cruel as Punch, for he had never killed a cub. He had cuffed them soundly whenever they had dared to come within reach of him, but always with the flat, soft palm of

his paw, and with just enough force behind it to send them keeling over and over like little round fluffy balls. This was Thor's only expression of displeasure when a strange mother-bear invaded his range with her cubs. In other ways he was quite chivalrous. He would not drive the mother-bear and her cubs away, and he would not fight with her, no matter how shrewish or unpleasant she was. Even if he found them eating at one of his kills, he would do nothing more than give the cubs a sound cuffing.

All this is somewhat necessary to show with what sudden and violent agitation Thor caught a certain warm, close smell as he came around the end of a mass of huge boulders. He stopped, turned his head, and swore in his low, growling way. Six feet away from him, grovelling flat in a patch of white sand, wriggling and shaking for all the world like a half-frightened puppy that had not yet made up its mind whether it had met a friend or an enemy, was a lone bear cub. It was not more than three months old—altogether too young to be away from its mother; and it had a sharp little tan face and a white spot on its baby breast which marked it as a member of the black bear family, and not a grizzly.

The cub was trying as hard as it could to say, "I am lost, strayed, or stolen; I'm hungry, and I've got a porcupine quill in my foot," but in spite of that, with another ominous growl, Thor began to look about the rocks for the mother. She was not in sight, and neither could he smell her, two facts which turned his great head again toward the cub.

Muskwa—an Indian would have called the cub that—had crawled a foot or two nearer on his little belly. He greeted Thor's second inspection with a genial wriggling which carried him forward another half foot, and a low warning rumbled in Thor's chest. "Don't come any nearer," it said plainly enough, "or I'll keel you over!"

Muskwa understood. He lay as if dead, his nose and paws and belly flat on the sand, and Thor looked about him again. When his eyes returned to Muskwa, the cub was within three feet of him, squirming flat in the sand and whimpering softly. Thor lifted his right paw four inches from the ground, "Another inch and I'll give you a welt!" he growled.

Muskwa wriggled and trembled; he licked his lips with his tiny red tongue, half in fear and half pleading for mercy, and in spite of Thor's lifted paw he wormed his way another six inches nearer.

There was a sort of rattle instead of a growl in Thor's throat. His heavy hand fell to the sand. A third time he looked about and sniffed the air; he growled again. Any crusty old bachelor would have understood that growl. "Now where the devil is the kid's mother?" it said.

Something happened then. Muskwa had crept close to Thor's wounded leg. He rose up, and his nose caught the scent of the raw wound. Gently his tongue touched it. It was like velvet—that tongue. It was wonderfully pleasant to feel, and Thor stood there for many moments, making neither movement nor sound while the cub licked his wound. Then he lowered his great head. He sniffed the soft little ball of friendship that had come to him. Muskwa whined in a motherless way. Thor growled, but more softly. It was no longer a threat. The heat of his great tongue fell once on the cub's face.

"Come on!" he said, and resumed his journey into the north.

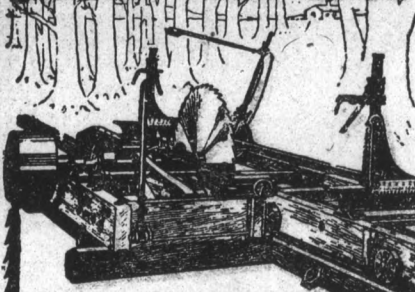
And close at his heels followed the little tan-faced cub.

(Continued next week).

Mistakes themselves are often the best teachers of all.—Carlyle.

No living person is sunk so low as not to be imitated by somebody.—Wm. James.

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EXPLANATION.—The first column gives the paper's regular subscription price. The second column price is for the Michigan Farmer and the other paper, both for one year. The third column gives the price at which other publications can be added if more than one is wanted in combination with the Michigan Farmer.

Example.—The combination price of the Michigan Farmer and Every Week, one year each, is \$1.50. If the American Poultry Advocate is wanted in addition to these two publications, 35c would have to be added, making the combination of the three publications, one year each, \$1.85.

If the Michigan Farmer is wanted for two years add 50c to the combination price; for three years add \$1.00, and for five years add \$2.00.

NAME OF PUBLICATION. See explanation above

	Daily (6 a week) on R. F. D. Only		
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Journal, Detroit.....	3.00	3.50	2.75
Times, Detroit.....	3.00	3.50	2.75
Herald, Grand Rapids.....	3.00	3.50	2.75
Press, Grand Rapids.....	3.00	3.50	2.75
News, Grand Rapids.....	3.00	3.50	2.75
News, Dowagiac.....	3.00	3.50	2.75
Courier-Herald, Saginaw.....	2.50	3.00	2.25
News, Saginaw.....	2.50	3.00	2.25
Gazette, Kalamazoo.....	3.00	3.75	2.90
Pioneer, Big Rapids.....	2.50	3.00	2.25
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American, Chicago, Ill.....	4.00	4.40	3.60

Tri-weekly Newspapers

World, N. C. City.....	1.00	1.65	.75
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Weekly Newspaper

Blade, Toledo, Ohio.....	.50	1.25	.35
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American Bee Journal.....	1.00	1.75	.35
American Poultry Advocate.....	.50	1.25	.35
American Swineherd.....	.50	1.25	.35
American Sheep Breeder.....	1.25	1.75	1.00
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Grange.

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STATE GRANGE MEETS.

(Continued from last week.)

The master reported that the \$5,000,000 mark is now practically reached by our new Grange Life Assurance Association—a matter of great pride and satisfaction.

He reported, under head of direct marketing of farm products, an unsuccessful attempt in Detroit to establish a direct selling station for Grange members, but it got no further than good promises from the mayor.

For the session and year to come Master Ketcham advised that Granges carry the dues of soldier boys during absence. He also advocated the holding of a series of Grange institutes where the range of agricultural topics could be made more elastic than under the old plan and some straight-forward organization addresses, such as were not permissible under state direction, could be arranged.

The report dwelt at some length with the farmer and price regulation, the farm labor problem, and war taxes and these three topics figured largely in the resolutions and discussions which later came before the body. These will be taken up in a later issue.

In closing, Master Ketcham recalled the fact that the Grange was born in a crisis which succeeded the Civil War. He predicted that, after fifty years of support of every cause and measure designed to improve agriculture and rural life, and opposition to all that was detrimental thereto, once again the Grange has before it a glorious opportunity in the reconstruction process that is even now during the war taking place.

JENNIE BUELL.

AMONG THE LIVE GRANGES.

Give Agricultural Pageant.—A fine audience greeted the agricultural pageant which was given recently by Charlotte Grange at the opera house. Music for the performance was given by Miss Adelaide Hart and Miss Katherine Sattler, and the participants in the entertainment were for the most part members of the Grange and their children, and the result was surely a very great credit to them. The play was written and arranged by Miss Derby, teacher of English at the Lansing high school, and the principal part, that of the monologist was taken by Miss Alice Greenawalt, who did her difficult and sustained part in a truly professional manner. The pageant opened with the appearance of Father Time and a dance of the hours and the seasons by a bevy of pretty and graceful girls. Then the past was shown in a very picturesque scene of the Indians of early American times, with Howard Martin as chief, their wigwams and fires, their incantations and dancing very realistic and well done. Then the coming of the padres, and the settlers, and finally the expulsion of the Indians from their happy hunting ground, not a scalp to show there was a bad Indian among them. The scene of the early settler, who found himself with a forest to cope with and land to break, represented the pioneering of the past, Willard Upright the pioneer. This and other scenes were acted in pantomime, Miss Greenawalt, dressed in yellow, with flowing hair, looking well the part of Ceres reciting throughout the story as it progressed. The present was shown by the work of the boys' and girls' clubs in corn planting and conserving and sewing. Mrs. Dora Stockman, of Lansing, state lecturer, being one of the ladies overseeing the work. The pageant ended with an assembling of the characters, fifty or more in a tableau, and the dance of the hours and seasons again, together with the singing of "America" and the appearing of "Columbia," a striking figure, taken by Miss Sadie Peck. C. H. Carrick sang two numbers during the evening—always an enjoyable event. Half of the proceeds are to go to the Y. M. C. A. army work, and there will be a generous purse. Much credit is due Mrs. Fred Curtis for her efforts in getting up the pageant and for its successful presentation.

Farmers' Clubs

THE ASSOCIATIONAL MEETING.

(Continued from last week.)

Wednesday P. M.

The first speaker of the afternoon was Gov. Sleeper, who spoke of the great changes that had taken place since he became governor. Very few knew what war meant and that Michigan had made the largest appropriation for this that ever was known. He heartily endorsed what the Red Cross was doing and closed his address by saying, "The war is on, we must win."

Dr. Caroline Bartlett Crane, State Chairman Women's Committee, Council of National Defense, then gave an address.

"The War for Peace."

"It is hard to realize that America is at war. We must feed our allies or they cannot help us. The struggle our grandfathers had with nature to make homes will look as nothing if this war does not end on the other side. We will fight this war to everlasting peace because we are American citizens. We must give to every good cause and substitute the products we cannot ship for those that can be shipped. The rural population must share this to a great extent. Our colleges and schools must be maintained if possible. Child welfare must not be neglected, as to save the life of a child is just as important as saving the life of a soldier. If we wish to fight for peace we must remember the common tasks. We must not lose our little children and we must do things to help in any way we can, thanking God we learned to give the service we owe our country."

H. D. Wendt, of the State Dairy and Food Department, then gave some fine thoughts on waste on the farm. The cost of distribution of milk has been placed at the same mark in Detroit as the cost of production, which is seven cents. Three million pounds of skim-milk is wasted each year on the farms of Michigan. Every 100 pounds of skim-milk will make fifteen pounds of cottage cheese. Where a few years ago one can of condensed milk was manufactured, now twenty-five are made, and where forty-nine pounds of cheese was imported, now forty-one pounds is exported, which shows a great increase in dairy products.

Mr. George McCormick, of the Food Committee of War Preparedness Board, was then introduced, and said in part:

"It is much easier to talk than to do the work of the farmer. When this committee was appointed to increase the amount of food produced they had no knowledge of how to do it, but had plenty of suggestions offered. The upper peninsula potato crop was increased three and one-half times, while that of the lower peninsula decreased from twenty to twenty-five per cent. There was an increase of sixty per cent in the bean crop. We must give our undivided attention to raising corn, wheat, meat and sugar, as only the United States can win this war. We must get to the essentials. We have enjoyed all the benefits of this country for fifty years and have made no sacrifices. We had become selfish and money chasers."

Wednesday Evening.

Dean Georgia White, of the M. A. C., opened the evening program with a talk on the conservation of food and after hearing the remarks of the afternoon the farmers were ready to receive all the war recipes in good part. Nothing but good feeling followed her remarks.

The Men's Glee Club of the M. A. C. then rendered three fine selections, which greatly pleased the audience.

Prof. C. H. Vantine then gave the address of the evening. In part he said:

"There are some yet who doubt that we are really at war. Then, too, there are some that think the war is of no consequence. Some say we were forced into war over the paltry loss of about 200 citizens at the time of the Lusitania disaster. Others say that the munition manufacturers wanted a bigger market for their wares. Still others said it was Wall street."

"Now, when we realize that this country has raised more money for the prosecution of this war than was spent for all the other wars combined, it looks as if we were in for some purpose. This country has already pledged \$31,000,000,000 to carry on this war. All our previous wars cost the country only \$27,000,000,000 in money."

Thus closed the twenty-fifth annual meeting of the State Association of Farmers' Clubs.

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If Ordered Together, Freight Paid Both of Rockies, Hot water copper tanks, double walls, dam air space, double glass doors, all set up complete, or 130 Egg Incubator and Brooder \$14.75. FREE Catalogue describing them. Send for it TODAY or order direct. Wisconsin Incubator Co., Box 66 Racine, Wis.

White Holland Turkey Toms \$8 and \$10. Hens \$5 and \$7. S. S. Hamburg Cocks \$3.00 each. Riverview Farm, Vassar, Mich.

Mention the Michigan Farmer when writing Advertisers

The Poultry Outlook for 1918

By R. G. KIRBY

ALTHOUGH it may be early to make any predictions concerning the poultry business for 1918, it is evident that the farmer's plans right now will in a large measure, determine the egg production next spring and the amount of poultry meat produced during the year. The question, "Why have the farm flocks been reduced in numbers?" is easily answered. In the majority of cases the farmers figured that the market value of the birds plus the value of the feed saved, would be worth more than the income from the eggs. Of course, certain systems of management will enable a farmer to make money on hens in spite of the cost of the feed. However, leaving the factor of management entirely out of consideration we find that the farmers endeavored to handle their poultry in a businesslike manner. Whether selling the hens has been bad business judgment or not will probably depend very largely upon factors which only a poultryman himself can know.

The Ideal Farm Flock.

When the professional poultryman feeding large flocks on a few acres, and buying all of his feed, can make the business pay, it seems that the farmer with less handicaps should make his flock a winner. The high price of feed has compelled many large poultry farms to reduce the size of their flocks or face financial ruin. At the same time the general farm presents an ideal location for the managing of a flock of hens. A flock of two hundred well-bred hens might be considered an ideal farm flock. They will have plenty of range. More or less waste material will be harvested by the birds. The feed will be largely produced on the farm and the large number of weed seeds, bugs and worms gathered by the poultry will reduce the cost of feeding them properly during a large portion of the year.

Save the Best Hens.

In planning the poultry campaign for 1918, a rigid culling of the flock will be necessary. If trap-nests have been used the farmer will know which are the high producers and these can be retained for breeders. In general the late moulting hens are the best layers and this forms a simple plan of increasing the flock averages on the farm. Band the late moulting hens, and use them exclusively in the breeding pens next year.

The purchase of a cockerel from a two-hundred-egg hen will be a good investment for the farmer. At present there are many professional poultrymen who are keeping accurate trap-nest records and they are able to sell cockerels for very moderate sums as advertisements in the farm journals indicate. Investments in breeding stock will be necessary on many farms where no effort has been made to improve the egg-laying ability of the flock. Some farmers may feel that the buying of a cockerel at a price of five or ten dollars because it comes from a two-hundred egg hen is a hazardous speculation. However, it is not as risk as breeding poor laying birds from year to year without making an effort to improve the production. I believe that most of our professional poultrymen are honest, both because they had rather be honest and because they know that it is the only way to achieve success. Probably the majority of farmers can easily see the results of improved breeding stock in one year if they breed from good birds and then give the progeny the feed and care which all poultrymen maintain is necessary with any kind of birds.

Keep Poultry Well Housed.

The poultry housing for the farm flock will be a factor in the success with the birds during the coming year. A house should be on a well drained

site and face the south. It should have an open front and be free from all draughts. It must not be overcrowded. Allow four square feet per bird and the poultry will have plenty of room if the house is clean. A clean house means that it is free from mites and lice, cobwebs, dirty litter and accumulations of droppings.

If the birds are not given free range they should have ample room to keep the supply of green food from being eaten to the ground. Shade is necessary to give the birds protection from the hot sun during the summer. Windbreaks will be of great value where the poultry yards are swept by the prevailing winds. In 1918 the farmer who has the best natural surroundings for his poultry will make the most money with the least effort, and while next year seems a long time away, much of the planning must be done now.

Incubator Necessary for Increased Production.

The farmer who desires to increase his production next year will undoubtedly need an incubator. Artificial hatching means good prices for early broilers and the pullets arrive at the condition for laying before winter. The early hatched birds have a long growing season and always seem to have more vigor. In every way there is a lot more satisfaction in maturing the poultry before the uncertain weather of late fall and early winter.

Artificial incubation means that brooders are necessary. They insure proper care for the young chicks during the stormy weather of spring and increase the number of chicks that it is possible to raise. Brooders of the right capacity should be ordered so that they will arrive at the farm long before they are needed. Nothing will discourage a farmer more than a successful hatch from the incubator, followed by the loss of half the flock or more because the brooder came a week late. In planning the poultry business for next year it will be absolutely necessary to have the right kind of equipment at the right time.

War Menus for 1918.

In making up the war rations for the farm hen, green food must not be neglected. It pays to raise enough manure on the home farm to carry the laying hens through the winter. Cut clover and sprouted oats are valuable to keep the birds in healthful condition and increase the production of eggs. Silage is being used for poultry with good success by some breeders. It is not impossible to believe that the laying house of the future will have some form of a silo as part of its necessary equipment. A chicken silo may prove as valuable in producing winter eggs as the dairyman's silo in keeping up the milk production in winter. Every year the value of green food in the hen's ration is more appreciated by the farmer who seriously makes an effort to make his poultry profitable.

A Wheatless Ration.

After a period of uncertainty it is evident that our Department of Agriculture and experiment stations have produced a wheatless ration which will give satisfactory results. Poultrymen have not been anxious to give up wheat in the mixing of the rations for their flocks, but the high price of this grain has forced a change upon them. The government's wheatless ration contains two pounds of cracked corn and one pound of oats as a scratch feed. The mash is three pounds of corn meal and one pound of beef scrap. The Missouri ration consists of cracked corn for scratch feed. The mash is as follows: One hundred pounds of bran, 150 pounds of wheat shorts, 100 pounds of beef scrap, four pounds of fine charcoal, three pounds of fine salt. In the rations where wheat is omitted and beef scrap is fed in rather large proportions, it is necessary to give green food abundantly.

Conditions change rapidly, but the general opinion seems to be favorable for the poultryman who manages carefully and plans for a busy season during 1918.

Make Some of This \$600,000,000



HOOVER, Chief of U. S. Food Bureau, and the Secretary of Agriculture, call on you farmers and poultry raisers to raise \$600,000,000 more of poultry this year than last. To do so is a patriotic duty—a profit-making work. To do so you must double—treble—quadruple your flocks. To do that the easiest, quickest, most economical way you need a 1918

X-RAY Incubator

Sent Express Prepaid to Practically All Points

Combines 20 Exclusive X-Ray Features. Completely hatches on only one filling oil during entire hatch. Duplex Central Heating Plant—directly underneath, furnishes natural, moist Mother Hen Heat. X-Ray Automatic Trip regulates the flame—no chilled eggs—no overheated sides. Read all about its 20 remarkable hatch-increasing, labor, time and money-saving features in our Free 1918 Book. A beautiful book packed with facts that will help everyone add to his income—to add to his knowledge of real, genuine incubator values—to know positively what to expect in an incubator. It tells all the facts about 1918 X-Ray Incubators and Brooders.

Letters from a few hundreds of the thousands who are using them. Facts that will help you to make more money with less work from poultry-raising. Send us your name and address today on the coupon or post card.



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Collins' Poultry EXERCISER AND FEEDER

No more wasting of high-priced grain; no lazy, over-fat, non-laying hens if you own and use a Collins' labor-reducing, time-saving exerciser and feeder. Reduces feed cost; rat and bird proof. Increases egg yield; improves fertility. Cut a five-inch hole in bottom of an old wood or metal pail, tub, can or bag (leave new metal for Government), attach feeder and for have one that would cost from \$1.25 to \$3. Strong, galvanized iron, steel rod. Hens pick at bait and scatter right amount of grain. Add 10c for Parcel Post. Open territory for pleased purchasers to act as agents.

Collins' Oat Sprouter--

All metal, fireless. Sent prepaid. 8 pans, 11x15 in., \$4; 5 pans, 11x15 in., \$3; 8 pans, 11x32 in., \$8. West of Miss. River add 50c. West of Rockies add \$1. Insures best, low-cost green feed. Don't bother writing for circular for I want you to use and see my feeder and sprouter so order today, use 10 days. If not the grandest things you ever used in poultry line, return—I'll refund money. Dealers: Order samples today.

W. H. COLLINS, 18 to 20 Harrison St., New York.

\$8.95 Champion 140-Egg Belle City Incubator

Prize Winning Model—Hot Water—Copper Tank—Double Walls of Fibre Board—Self Regulating—Thermometer Holder—Deep Nursery. When ordered with \$5.25 Hot Water 140-chick Brooder—both cost only \$12.95.

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Over 650,000 Satisfied Users Start Early-Order Now-Share in my \$1000 Cash Prizes Conditions easy. Or write today for my Free Book, "Hatching Facts"—It tells all. With this Champion Hatching Guide and my Guide Book for setting up and operating, you are sure of success. Jim Rohan, Pres. Belle City Incubator Co., Box 14, Racine, Wis.

GET OUR "PEACE" PRICES ON "Successful" INCUBATORS & BROODERS

Mail a postal—Get our offer. Poultry lessons free to every buyer. Booklet, "How to Raise 48 Out of 60 Chicks," 10c. Catalog FREE. Make green, egg-making feed in "SUCCESSFUL" Grain Sprouters. DES MOINES INCUBATOR CO. 308 Second St., Des Moines, Ia. 25 Years of Big Successes

150 EGG INCUBATOR CHICK BROODER

Both are made of Calif. Redwood. Incubator is covered with asbestos and galvanized iron; has triple walls, copper tank, natural gas heater, thermometer, ready to use. 30 DAYS' TRIAL—money back if not O.K. Write for FREE Catalogue. Belle City Incubator Co., Box 14, Racine, Wis.

When writing to advertisers please mention The Michigan Farmer.

MANKATO INCUBATOR
6 BIG NEW FEATURES
That will smash all hatching records for 1918. Large Oil Tank, Redwood Case, End Regulator, Double Heating, Hot Water and Hot Air, New Ventilating System, Big Hatches, Mankato Incubator Co., Box 717, Mankato, Minn.

EXPRESS PREPAID

NEW KIND OF INCUBATOR
Requires 3 minutes a day. Saves work, time, money. Built round, like hen's nest. No cold corners. One gallon of oil, one filling of lamp to a hatch. Wonderful built-in moisture attachment and complete circuit radiators mean even heat, moist and mild always. Many other features that save work, time and money fully described in new FREE book—write postal for your copy NOW. Radio-Round Incubator Co., 671 Roger St., Wayne, Neb.

50 Best Paying Varieties
Hardy Northern raised Chickens, Ducks, Geese and Turkeys. Pure-bred heaviest laying strains. Fowls, Eggs, Incubators, all at low prices. Large new Poultry Book and Breeders' Complete Guide Free. W. A. WEBER, Box 20, Mankato, Minn.

POULTRY

HOMESTEAD FARMS

POULTRY SALE
We have the following birds for immediate delivery. Pullets—full grown and about ready to lay: 24 White Plymouth Rocks; 20 Barred Plymouth Rocks; 10 S. C. Rhode Island Reds; 10 White Leghorns; also 20 Leghorns two-thirds grown; 12 Black Orpingtons. Yearling Hens—moulting finished 6) S. C. White Leghorns; 3) S. C. Rhode Island Reds; 12 Black Orpingtons. Cockerels—Rose and Single Comb White Leghorns; Barred Plymouth Rocks; Rhode Island Reds; Black Minorcas. These are season closing sales. HOMESTEAD FARMS, Bloomingdale, Mich.

BREEDING COCKERELS

Trap-nested, bred-to-lay stock. S. C. White Leghorns, combs slightly frosted \$1.25 each. Barred Rocks \$2 each. SUNNYBROOK POULTRY FARM, Hillsdale, Mich.

John's big beautiful hen-hatched Barred Rocks, good layers, Pens (5 birds) \$12 to \$20. \$3 to \$10 each, sold on approval. Circulars, photos, John N. Orthon, Clare, Mich.

Barred Rocks Cockerels for sale from strain with records to 290 eggs a year. \$2 to \$5 each. Circular free. FRED ASTLING, Constantine, Mich.

Barred Rock Cockerels bred from Great Layers few hens yet. W. C. COFFMAN, R. 3, Benton Harbor, Mich.

Barred Plymouth Rock cockerels \$3.00 each. Full blood from prize-winning heavy laying strain. J. A. Barnum, Union City, Mich.

Barred Rocks Cockerels from good laying strain \$3.00 each two for \$5.00. A. A. WOOD & SON, Saline, Mich.

Chicks We ship thousands, booking orders now for spring delivery. free booklet. FREEPORT HATCHERY, Box 14, Freeport, Mich.

Breeding Stock Hens and Cockerels pure bred S. C. W. Leghorns \$1.25 up. White Line Poultry Farm, Hillsdale, Mich.

Ferris White Leghorns
A real heavy laying strain, trap-nested 17 years, records from 200 to 264 eggs. Get our special summer prices on yearling hens, breeding males, eggs for hatching, 8-week-old pullets and day old chicks. We ship C. O. D. and guarantee results. Catalog gives prices; describes stock; tells all about our farm and methods; results you can get by breeding this strain. Send for your copy now—it is free. GEORGE B. FERRIS, 934 Union, Grand Rapids, Mich.

Giant Pekin, Aylsbery, Buff Orpington, and Colard Ch'na. Brown China Geese \$3 each. Domesticated Wild Geese \$5 each. White Rock, Barred Rock, Buff Rock, Site Brahma. S. C. Rhode Island Red, S. C. W. Leghorns and Ancona chicks. \$3 order direct. Cedar Lawn Poultry Farm, Wapakoneta, Ohio.

Pine Crest S. C. White Orpingtons, special sale of year old cocks and hens also young cockerels. MRS. WILLIS HOUGH, PINE CREST FARM, Royal Oak, Mich.

Laybitt S. C. W. Leghorns Large, great layers. Pure white. Bargains in choice breeding hens now. Everfresh Egg Farm, Ionia, Mich.

BUFF Leghorns, breeding cockerels also a few fine pens of four hens and cockerel for \$10. More hens \$2 extra. Dr. William A. Smith, Petersburg, Mich.

Fowlers Buff Rocks Cockerels Pullets and hens for sale from two dollars up according to quality. B. B. FOWLER, Hartford, Mich.

RHODE ISLAND REDS and Plymouth Rocks Males \$5 to \$12 lbs. according to age \$2 to \$5; P. R. hens weight 5 to 10 lbs. eggs 15 for \$1; 100, \$5; 120, \$3. Mammoth Bronze Tom Turkeys 8 to 35 lbs. according to age \$5 to \$25; 10 eggs \$3. J. Morris & J. Barsan, Vassar, Mich.

RHODE ISLAND REDS, Both Combs. Cocks, Hens, Cockerels and Pullets at reasonable prices. Interlakes Farm, Box 39, Lawrence, Mich.

R. C. Br. Leghorn Cockerels. Leading strains America, bred from winners. \$2 each after Dec. 1. A square deal, orders promptly filled. E. Himebaugh, Coldwater, Mich.

R. C. Br. Leghorn cockerels \$1.50 and \$2. A few nice Imperial Pekin Ducks \$2 each. Drakes all sold. Mrs. Wm. Nickert, Carson City, Mich.

S. C. W. Leghorn hens two years old, and late hatch. S. ed pullets \$1 each. Cockerels, utility and trap-nested \$1.50 to \$5. Hillcrest Poultry Farm, Ypsilanti, Mich.

SILVER Golden and White Wyandottes. Choice breeding stock of sale after Oct. 1st, a few bargains in yearling hens. C. W. Browning, R. 2, Portland, Mich.

WHITE Wyandottes. I have a fine lot of April and May hatching cockerels for \$3.00 and \$5.00 each. DAVID RAY, 709 Norris St., Ypsilanti, Michigan.

White Wyandottes 50 extra choice cockerels \$3 to \$5. I ship on approval and guarantee satisfaction. Milton E. Stewart, R. 3, Augusta, Mich.

White Chinese Ganders Pekin Ducks and a few R. C. Br. Leghorn hens. Cockerels all sold. MRS. CLAUDIA BETTS, Hillsdale, Michigan.

Mammoth Bronze Turkeys Hens \$5 yearling tom \$8. Mrs. S. McKINLEY, New Hudson, Mich.

White Holland Turkeys for sale as breeders. Prices reasonable. Mrs. ED. COLLING, Fostoria, Mich.

Additional Poultry Ads on Page 35

Veterinary.

CONDUCTED BY W. C. FAIR, V. S.

Pimples.—I have two colts that are covered with large pimples, but the back and hip are troubled most. Both of these colts have been running out all summer and fall until a few days ago. E. W. S., Wayne, Co.—Apply one part salicylic acid and 30 parts olive oil to soften up scabs and bunches on back and hips, then in a few days wash them with soap and water, then occasionally apply one part carbolic acid and 30 parts olive oil, but don't forget to groom your colts well twice a day and feed them plenty of nutritious food. Give each colt a teaspoonful of sulphate of soda once or twice a day.

Worms.—My horses are troubled with worms; some of them have long white worms others small pinworms. What had I better give them? W. B. E., Lucas, Mich.—Mix together equal parts of dried powdered sulphate iron, ground gentian, ground red cinchona, salt and fenugreek—give each one of your horses a tablespoonful at a dose in soft feed twice a day.

Bowel Parasites.—I have two colts that have worms. I have tried several times to get them but failed. Have just finished giving them a course of worm powders. I gave one a pill, the other colt a larger dose and this medicine failed to purge them. These colts have a ravenous appetite and their food fails to do them much good. M. B. K., Traverse City, Mich.—Give each one of your horses 15 grs. of calomel, 1 dr. of santonine and 1 oz. of ground gentian at a dose in soft feed three times a week for three weeks. Then give them 1 oz. of turpentine and 1½ pts. of raw linseed oil as a drench, if you believe they require a laxative. In drenching with oil and turpentine the head should not be held too high, the tongue should be left alone, as well as the throat. It is altogether too common a practice in drenching a horse to hold the head too high, to pinch the throat and pull out the tongue. This is a mistake, as part of the drench may go down the windpipe and bring on mechanical pneumonia, resulting in the death of the horse.

Hoof Sloughed off.—I have a mare 14 years old; about two weeks ago she went lame in one hind leg. A swelling appeared at coronet, leg stocked to hock, pus commenced to ooze out of heel and now the entire hoof has dropped off. What do you advise me to do, and as she is 14 years old it occurs to me that she may not be worth much. A. V. S., Deckerville, Mich.—All things considered, you had better destroy her.

Indigestion.—I have a seven-year-old Holstein cow out of condition; seems weak, lies down great part of the time, but she has fairly good appetite. Is on clover pasture and is fed bran and dried brewers' grain twice daily. She came fresh in June, has not yet been bred. This cow has record and local Vet. tells me she is worn out, but I can't believe it as she has always been strong and rugged. A. R. G., Flint, Mich.—She should be fed plenty of easily digested nutritious food, and give her 1 oz. of cooking soda, 1 oz. of ginger and 1 oz. of ground gentian at a dose in feed two or three times a day.

Catarrh.—My chickens seem to have cold in head, eyes water, and I might say this is the first time my fowls have been sick. We built a new coop this fall, not only the roof, but walls and cement floor is wet. Is this the cause of their sickness? E. G. D., Pittsford, Mich.—You should heat and dry your new coop and keep it dry and free from draft of cold air. Mix equal parts of cooking soda, ginger and ground gentian together and give each bird one-eighth part of a teaspoonful in feed once or twice a day.

Young Bull Coughs.—I have a Jersey bull 11 months old that usually coughs when drinking cold water and occasionally when eating food. There is a bunch in throat and I have been suspicious that he might have tuberculosis. Some of my neighbors tell me that he might be troubled with worms, but I have treated him for this ailment. W. H. W., Barryton, Mich.—Before you purchased your young bull, you should have had him tested with tuberculin to ascertain whether he had tuberculosis or not. His coughing occasionally does not necessarily indicate that he suffers from this incurable ailment, but every breeder and dairyman should have their cattle tested with tuberculin to ascertain whether they own healthy or unhealthy cattle. Apply one part iodine and nine parts of fresh lard to bunch in throat once or twice a day. If you stable him, let in plenty of fresh air.

The Michigan Shorthorn Breeders' Association

will hold its

THIRD ANNUAL SHOW AND SALE

January 16-17-18, 1918

at the M. A. C., East Lansing, Michigan

Judging the cattle will be done Wednesday Jan. 16th. The annual meeting of the Ass'n will be held at 4 p. m. Jan. 17. Sale of cattle on Friday Jan. 18 at 1 p. m.

Thirty-five females six with calves by their side and thirty-five young bulls.

Plan to attend our meeting on Jan 17. Banquet in evening.

Send for Catalogue

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This Company is backed by more than 500 of the best live stock farmers of the state, and we have more than \$100,000 deposited with the State Treasurer as a guarantee of the Company's responsibility.

We insure all live stock—horses, cattle, sheep and hogs against death from any cause.

We issue individual and blanket policies covering any and all conditions—herd policies, feeding policies, shipping policies, 30 day foaling policies, etc.

We want a local agent to represent us in every community in Michigan.

We want every farmer in the State of Michigan to insure his live stock with us.

We will give you a square deal.

Write for information.

Colon C. Lillie, Pres. and Supt. of Agts.

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BREEDERS' DIRECTORY.

Change of Copy or Cancellations must reach us Ten Days before date of publication.

We Offer a Few Special Bargains
In S. C. White Leghorn cockerels, Rambouillet rams, Hampshire pigs (either sex) and Holstein bulls. A good chance for a small investment to reap the benefit of a large expenditure of capital and years of expert breeding.

Flanders Farm, Orchard Lake, Mich.

CATTLE.

WOODCOTE ANGUS

Trojan-Ericas and Blackbirds only Breeders of the dam and former owners of the sire (our herd bull) of the Grand Champion Bull at the International Chicago for 1917.

WOODCOTE STOCK FARM, Ionia, Mich.

M. S. D. AYRSHIRES

We have for sale a choice lot of young stock from A. R. dams. Also a few mature cows. Write for particulars.

W. L. HOFFMAN, Steward,
School for the Deaf, Flint, Michigan

Registered Guernseys

Stock always for sale. May Rose Strain—Herd Tuberculin tested annually. Never had a reactor—no abortion. J. M. WILLIAMS, North Adams, Mich.

Guernseys For Sale, four young registered cows. Tuberculin tested. Geo. N. Crawford, Holton, Mich.

GUERNSEYS must reduce herd, so offer a few choice females of Glenwood breeding also bulls, all stock of A. R. breeding, herd tuberculin tested. T. V. HICKS, Battle Creek, Mich.

GUERNSEYS—REGISTERED

Containing blood of world champions. HICKS' GUERNSEY FARM, Saginaw, W. S., Mich.

Avondale Stock Farm, Wayne, Michigan have on Guernsey Cattle in the Michigan Holiday Guernsey Sale at Jackson, Michigan. Dec. 27, 1917.

For Sale Registered Guernsey bull calves May Rose breeding. JOHN EBELS, Holland, Mich.

REG. HOLSTEINS: Herd headed by Albina Bonte Butter Boy No. 93124. Dam's record at 6 yrs. butter 28.53 lbs. milk 619.4. Yearly record at 2½ yrs. butter 502 lbs. milk 15622 lbs. W. B. READER, Howell, Mich.

CLUNY STOCK FARM

100--REGISTERED HOLSTEINS--100

When you need a herd sire remember that we have one of the best herds in Michigan, kept under strict sanitary conditions. Every individual over 6 mos. old regularly tuberculin tested. We have size, quality, and production records backed by the best strains of breeding.

Write us your wants. R. BRUCE McPHERSON, Howell, Mich.

A Good Note accepted in payment of finely bred registered Holstein bull calves. Quality of the best, and at prices within reach of all. Write. GEO. D. CLARKE, Vassar, Mich.

Parham's Pedigree Stock Farm offers Reg. Holstein cattle, Chester White Swine, extra bargains in calves and fall pigs. Bulls half price. R. B. PARHAM, Bronson, Mich.

\$50 Gets son of 30 lb. bull dam is grand daughter of De Koi 2nd Butter Boy 3 rd. Her dam 18.96 lb. 2 yr. old. M. L. McLAULIN, Redford, Michigan.

A Few Fine Bulls For Sale

Bigelows Holstein Farms, Breedsville, Mich.

REG. Holstein Bull Calf. The last one until winter. A good one with A. R. O. backing. Write for pedigree and price. Elmer E. Smith, Redford, Mich.

Additional Stock Ads. on Page 35

THE POTATO MARKET.

The following are jobbing prices and shipments for the United States for the period December 18-25 inclusive.

Potatoes Show Firm But Uneven Tone.—Shipments and selling movements have continued rather light in the producing sections from a combination of influences as severe weather, car shortage and the waiting attitude of both holders and buyers, but total was about one-fourth larger than last week's very light movement. Maine continues a relatively heavy shipper with 401 cars, likewise Colorado with 204 cars, and Idaho 186 cars, while the northern lake region shows an increase over last week. Reports from various shipping points west and east suggest probable resumption of heavy movement in the latter part of the winter and early spring. Prices, although averaging about steady show an uneven trend. Eastern and northern markets have been fairly firm while various western points appear slightly weaker, a natural relative condition in view of the more liberal offering of stock reported at western shipping and market sections. Presque Isle, Maine, reports a few sales of Green Mountains at range of \$1.82@1.89 per 100 lbs. bulk from wagons compared with top figure of \$1.82 last week. Rochester, New York, quotes No. 1 round whites unchanged at \$2.15@2.25 sacked f. o. b. A wide but higher range \$1.85@2.08 f. o. b. sacked for No. 1 round whites prevailed at Grand Rapids, Michigan. Car shortage is reported a serious check on movement of stock. Sales by farmers at other Michigan shipping points range at \$1.30@1.50 sacked. Wisconsin round whites held at \$1.25 sacked track side at Waupaca, and \$1 at various country loading points, with some increase in both supply and demand. Minnesota red river Ohios have maintained value at \$1.50 in bulk from wagons at Moorhead, holding steady throughout recent fluctuations in other markets. Colorado white stock sold at \$1@1.15 sacked, from wagons and \$1.25 sacked f. o. b. in carloads. Idaho and northwestern shipping points reached \$1.25 per 100 pounds sacked for choice stock only, while general range was \$1@1.10 with a rather weak tone, but many growers appeared unwilling to sell. In the large cities the jobbing price ranges were uneven but with only moderate changes either way. Eastern markets appeared stronger than central and western; thus Michigan round whites were up 10c in New York, jobbing at \$2.37@2.50 per cwt. in bulk and up 5c in Boston at \$2.40@2.45, with a similar movement in Maine Green Mountains, but the Wisconsin round whites in Chicago were unchanged at \$1.90 in bulk and weakened 5c in Washington, Detroit, etc. Colorado white stock sagged off from recent tops 5@10c in southwestern markets but fully maintained the previous week's values at \$1.70@2.35 per 100 lbs. sacked. General potato demand has been slow to moderate.

LIVE STOCK NEWS.

According to W. A. Wegand, who was in the Chicago live stock market recently with a shipment of two carloads of cattle which he had been feeding for 60 days on corn, molasses feed and cottonseed meal, labor is very scarce in Henderson county, Ill. He fed the cottonseed meal to help out the soft corn. He stated that not much corn thereabouts is being cribbed, it being so soft that most of it is being fed to cattle and hogs. Plenty of cattle are being fed, as well as the usual number of hogs, and there is sufficient feed to provide for an average number of swine next year.

Shortly after the recent decline in prices for hogs W. D. Cartwright, of Story county, Iowa, was in the Chicago market with a shipment of 65 prime fat hogs which averaged 265 pounds and brought \$17.55 per 100 pounds. They had run for 41 days in the corn fields and made a profit of more than \$900 for the corn.

Beginners in Holstein Breeding!

Stop and consider the importance of starting right with foundation females of the right type and guaranteed right.

at the Michigan Agricultural College, East Lansing, Mich., on

JANUARY 18th, 1918

At 9:30 A. M. Sharp

The Central Michigan Holstein Breeders will sell

Thirty-five head of inspected and guaranteed females that are especially fit for foundation purposes, including a consignment of six head from the M. A. C. herd and consignments from eleven other Central Michigan Breeders of whom some have been a lifetime in the business and all have good reputations which they are pledged to maintain and strengthen by their cattle and dealing at this sale.

You can do no better than decide now to make your start at this sale. Send for catalog to

Chas. A. Daniels, Secretary, Okemos, Michigan.

Jerseys and Duroc Jerseys

The most important thing in buying a Jersey bull is to get one backed up by generations of high producers. Brookwater offers to sell a few choice bull calves of this kind. Our herd of Durocs has won more prizes at the State Fairs this year than any other.

Boar Pigs and Yearlings For Sale.

H. W. MUMFORD,
OWNER

BROOKWATER FARM

O. F. FOSTER,
MANAGER

Ann Arbor, Mich., R. 7.

CATTLE

FOR SALE High grade Guernsey bull calf. Nicely marked at \$200. Kingston, Mich.



Modern Efficiency
Standards Set

**PURE BRED
HOLSTEINS**

Above All Other Breeds

Official tests have proven purebred Holsteins give more milk and butterfat at a lower cost of production, with less "overhead" than any other breed. Write for the facts about the profitable breed—free.

The Holstein-Friesian Association
Of America, Box 164, Brattleboro, Vt.

"TOP-NOTCH" HOLSTEINS

"Milk production is an inherited ability. Good cows must be bred to good pure-bred bulls if progress in dairying is to be made."

Extract U. S. Dept. of Agric. Bulletin.

Here is a great "Milk" Bull having the ability to transmit large milk and butter production.

Born Sept. 20, 1915.
His Sire's 3 nearest dams average: Butter 7 days 30.87 lbs.
Milk 365 days 20854 lbs.
His Dam's Records: Butter 365 days 842 lbs.
Handsomely marked, about 1/4 white. Price \$300.

McPherson Farms Co., Howell, Mich.

I Always Have Holsteins To Sell

If wanting registered cattle write me your wants before placing your order elsewhere.

L. E. CONNELL, Fayette, Ohio

WINWOOD HERD REGISTERED HOLSTEINS

Holton, Mich.

Reference: Old State Bank, Fremont, Mich.
Flint Maplecrest Boy sire in service
His sire is Maplecrest Korndyke Hengerveld, his 3 nearest dams each over 30 lbs. of butter in 7 days. His dam and grand dam both made over 1200 lbs. of butter in year. It is the yearly cow we are looking for to deliver the goods. Flint Maplecrest Boy's Dam is Gluck Vasser Bell, 30.57 lbs. of butter in 7 days and 120 lbs. in 30 days. Her butter fat test is 5.27. This looks about right to the man who goes to the creamery. We have Bull Calves from 2 weeks to 8 months old for sale at dairy farmers' prices all out of A. R. G. Heifers. Write & tell us the kind of a bull you want.

John H. Winn, (Inc.), Holton, Mich.

FOR SALE One registered Holstein bull calf. Sire's twenty nearest dams have 7 lbs. of butter in 7 days. Butter Dam to be tested. A finely marked, growthy individual. Long Vein Farm, R. 3, Box 10A, Rochester, Mich.

2 CHOICE Holstein bulls nearly old enough for service. No. 1 born January 24, 1917, sire's dam, grand-dam and great-grand-dam's semi-official records average 942 lbs. butter. Dam of calf 18 lbs. butter 7 days as senior 2-yr. old, average per cent fat 4.3. No. 2 Sired by 23 lb. bull and out of a 14 lb. junior 2-yr. old. C. L. BRODY, Owner, Fort Huron, Mich.
Chas. Peters, Herdsman, Three Rivers, Mich.

Butter Fat Counts

Holstein Bull Calves from a 30 lb. 6.53% Sire. Dam are grand daughters of the King of the Pontics. Their dams grand daughters of Saddle Vale Concordia the first 30 lb. cow. Edwin S. Lewis, Marshall, Mich.

Holstein Bull Calf born Mar. 7, fine individual a prize winner from 29.62 lb. Sire and 23.80 lb. 4-yr. old dam. Price low. Owosso, Mich.

Reg. Holstein bull and heifer calves for sale. Extra heavy milking dams. Okemos, Mich.

C. L. HULETT & SON,

FOR SALE Daughter of a 24 lb. grand-daughter of Hengerveld De Kol from King Vale Palmera Payne, our 23 lb. grandson of King Payne Segis. This heifer is 9 mos. old. 95 white and a beauty. Come to see her. Bull calves at right prices. Manchester, Mich.

F. M. PIERCE & SON,

OAK LEAF FARM

Herd sire Lenawee Pontiac Calamity King offer Registered Holstein bull calves from the above sire whose dam holds the milk and butter (32%) record for 7 days in the state of Ind.

E. M. GEARHART & SON, R. 4, Marcellus, Mich.

Reg. Holstein Bull Calves Pontiac Korndyke and Hengerveld De Kol Breeding at Farmers Prices. John A. Rinke, Warren, Mich.

For Sale Registered Holstein bulls ready for service and bull calves from 30 lb. sire and A. R. O. dams with records up to 25 lbs.

Wm. GRIFFIN, R. 5, Howell, Mich.

3--HOLSTEIN BULLS--3

Ready for service at Long Beach Farm, Augusta, Mich.

Car Load heavy springing high grade Holstein cows produce 50 to 60 lbs. when fresh.

IN size \$100, bull calves without papers \$25.

NORMAN EDDINGTON, Brighton, Illinois

Holstein bull, 12 mos. old. Light in color 20 lb. dam, 30 lbs. sire, \$100, bull calves without papers \$25.

DEWEY C. PIERSON, Hadley, Mich.

HEREFORDS

ALLEN BROS.

PAW PAW, MICH.

Herefords Bob Fairfax 49427 at head of herd. Stock for sale. Both sexes either polled or horned. EARL C. McCARTY, Sec'y Mich. H. B. Ass'n, Bad Axe, Mich.

Jersey Bulls for Sale from high-producing dams, with semi-official test. C. B. Webster, R. 6, Allegan, Mich.

Jersey Bulls For Sale

Ready for service. Raleigh - St. Lambert breeding Waterman & Waterman, Packard Rd., Ann Arbor, Mich.

Illie Farmstead Jersey Cattle. 3 bulls, ready for service, out of R. of M. dams. 10 heifers bred to freshen next fall. Colon C. Lillie, Coopersville, Mich.

For Sale Two registered Jersey bull calves. Splendid individuals. Good pedigrees. Priced to sell. Long Vein Farm, R. 3, Box 10A, Rochester, Mich.

FOR SALE 3 cows, 3 yrs. old with records, 1 heifer, 2 yrs. old, 2 heifers 1 yr. old, 2 heifer calves, 1 bull 6 mo. old out of an imported daughter Noble of Oakland. For price and pedigrees write **FRED A. BRENNAN, Sec., Capac, Mich.**

Choice Bulls ready for service. Also heifers of Royal Majesty. Come and see them or write for particulars. **THE WILDWOOD HERD, Alvin Belden, Capac, Mich., Phone LB-5**

FOR SALE Registered Jersey bulls, ready for service.

SMITH and PARKER, R. 4, Howell, Mich.

MAPLE Lane R. of M. Jersey Herd has for sale R. of M. cows, daughters of R. of M. cows, bull calves, heifer calves and bulls. All from 500 & 600 lb. dams. **IRVIN FOX, Allegan, Mich.**

Shorthorn Cattle of both Sex for Sale

W. W. KNAPE, Howell, Michigan.

Shorthorns—Dairy beef bred. Breeding stock all ages for sale at farmers' prices. C. W. Crum, Secy. Cent. Mich. Shorthorn Breeders' Ass'n., McBride, Mich.

SHORTHORNS Maple Ridge Herd, Established 1867. No stock for sale. **J. E. Tanswell, Mason, Michigan.**

BIDWELL SHORTHORNS

For Beef and Milk.

5 Bulls ready for service, 15 months to 2 years for sale; also good Scotch-topped cows and heifers. Modern, sanitary equipment. One hour from Toledo. Ohio. N. Y. O. Ry. Visitors Welcome. Write us.

BIDWELL STOCK FARM

Box B, Tecumseh, Michigan.

Shorthorns for sale, 5 bulls Scotch top 10 to 14 mos., 3 roan, 1 white, 1 red, price \$150. to \$250. Isen of Maxwellton Sultan, 19 mos. \$350. C. Carlson, Leroy, Mich.

Bates Short horns the original milk strain young bulls 8 mos. old for sale. Price \$150 to \$200. **J. B. HUMMEL, Mason, Mich.**

Shorthorns. Bulls 9 mos. to 12 mos. old from good milking cows. Prices reasonable. **COLLAR BROS., R. 2, Conkling Mich.**

Milking Shorthorns—Bull calf 5 mos., by a Grand-son of General Clay, dam by a son of General Clay, \$150. A few females. **S. E. BOOTH, Morrice, Mich.**

Registered Shorthorn calves sired by Diamond King 2nd, 40475, both sexes \$150. Twenty cows \$250 each. **WM. J. BELL, Rose City, Mich.**

For Sale Shorthorn Bulls 6 mos. to 2 years old from good milking cows. **R. R. Clyde Station, H. J. DeGarmo, R. 6, Milford, Mich.**

Shorthorns both sexes, herd catalogue mailed free. **CHARLES R. HORRLE, Hart, Mich.**

SHORTHORNS. Butterfly Sultan, half brother to International St. Champion, in service. For good bulls, cows, and heifers. **W. B. McQuillan, Howell, Mich.**

For sale: Reg. Shorthorns. Two Roan bulls, one 15 mos. one 9 mos. and one Red heifer 18 mos. old. **J. A. BATCHELER, Howell, Mich.**

Milking Shorthorns and Polled Durhams, 20 head cows heifers and young bulls, Sultans, Duches and Sittyon Duches included. **M. J. Hatfield, R. 1, Orion, Mich.**

Shorthorns Maxwellton Monarch 2nd, 38722 half brother to 5 Grand Champions in service. **JOHN SCHMIDT, R. 5, Reed City, Mich.**

HOMESTEAD FARMS

We have for immediate delivery the following thoroughbred registered stock:

Shorthorn Durhams. Milking strain Scotch topped, one roan cow, Mary Bell, B1419, seven yrs. old, with calf by Maplewood Martin, 57004. Also one heifer calf, App. B. B17, Bates milking strain. Advance orders for spring calves, both sexes.

Holsteins and Jerseys—Advance orders for spring bull calves. Bloodlines on application.

Hampshire and Duroc Jersey Hogs—A limited number of boar and sow pigs. Write for full description of any stock.

HOMESTEAD FARMS, Bloomington, Mich.

Cattle For Sale

2 Loads feeders and two loads yearling steers. Also can show you any number 1, 2 and 3 year old from 600 to 1200 lbs. **Isaac Shanstrom, Fairfield, Iowa. R-8**

HOGS.

DUROC SOWS AND GILTS

bred to Orions Fancy King 83857 the biggest pig of his age ever shown at the International weighed 650 lbs. at 14 months, 25 lbs. 26 months. Catalogue giving breeding and description of 30 sows and gilts, ready for mailing.

Newton Barnhart, St. Johns, Mich.

Reg. Duroc Jersey Sept. Boar Pigs

out of a litter of twelve, with the rich blood of Proud Cherry King and his ancestors back to Cherry King, and through the dam to Principle 4th, Orion Chief's Bell 5th, Jack's Friend and Cherry's Big Jane. I can spare two to of them at \$25 each. The first checks get them. Also have a fine Delaine ram, registered in American and Delaine-Merino Association. Weighs approximately one hundred and fifty lbs. The first check for twenty-five dollars gets him. Your money back if not pleased with pigs or ram. Address: **Lakefield Farm, care of John E. Lambert, So. Virginia Park, Detroit, Mich.**

DUROCS Orion Chief Perfection No. 69945, and Jennings Plot Wonder No. 73374. Two outstanding boars of big type and excellent quality. All selected large type smooth sows, thirty, smooth, large boned spring gilts from these head boars and choice sows at very reasonable prices. The Jennings Farms, Bailey, Mich.

DUROCS service boars, bred sows, fall pigs. Express paid. **J. H. BANGHART, E. Lansing, Mich.**

Pinehurst offers: Registered Spring Boars, tried brood sows, One Great Herd Boar. Write your wants. **Orlo L. Dobson, Quincy, Mich.**

Duroc Jersey Spring gilts and fall pigs either sex. **E. D. HEYDENBERG, Wayland, Mich.**

DUROCS for sale, 1 fall boar, 7 Spring boars, good breeding. Write for description and prices. **J. D. CRANE & SON, Plainwell, Mich.**

Duroc Jersey: Extra good spring pigs for sale. **CAREY U. EDMONDS, Hastings, Mich.**

Duroc Jerseys—boars of the large heavy boned type, prize winning stock, prices reasonable, type and breeding considered, also gilts bred to Junior Champion boar for spring farrow. **F. J. Drott, R. 1, Monroe, Mich.**

DUROC JERSEY SOWS

Bred to one of the best young boars in Mich. for Max farrow. **RUSH BROS., Romeo, Mich.**

A FEW Duroc Jersey bred gilts for sale. Some extra good fall boars. **W. C. TAYLOR, Milan, Mich.**

Duroc gilts bred for April farrow \$35 to \$40; fall yearlings bred for April farrow \$45 to \$50 weight 175 lb. to 250 lb. Priced for 10 days. **H. G. Kessler, Cassopolis, Mich.**

DUROC Jerseys. Orders booked now for early spring pigs. **R. C. R. 1 Red cocks \$3.00, eggs in season. E. E. CALKINS, R. 6, Ann Arbor, Mich.**

FOR SALE Duroc Jerseys. 3 good spring boars.

JOHN MCNICOLL, Station A, R. 4, Bay City, Mich.

BOARS

O. I. C. Big growthy fellows. The kind that pleases. I ship C. O. D. and pay express. **J. CARL JEWETT, Mason, Mich.**

Big Type O. I. C's.

Stock of all ages for sale. We showed at four state fairs and won more champions and Grand Champions than all the other breeders together double, we were Premier Breeder and Exhibitor at every fair we showed. We breed the best. We sell the best. We guarantee them to be the best. Write your wants. Get our Catalogue. We ship on approval. **CRANDELL and SON, Cass City, Mich.**

O. I. C. Choice Spring boars and gilts out of prize long bodied and Big Bone type. Write for photo and low prices. **A. V. HATT, Grass Lake, Mich.**

Raise Chester Whites

Like This

the original big producers

I HAVE started thousands of breeders on the road to success. I can help you. I want to place one hog from my great herd in every community where I am not already represented by these fine early developers—ready for market at six months old. Write for my plan—More Money from Hogs. **G. S. BENJAMIN, R. F. D. 10, Portland, Michigan**

Chester Gilts bred for March farrow early fall pigs both sexes from best blood lines. **F. W. ALEXANDER, Vassar, Mich.**

Additional Cattle Ads. on Page 39

Markets.

GRAINS AND SEEDS

December 31, 1917.

WHEAT.—The recent active demand for wheat continues. Mills are taking cars as rapidly as they appear. This is due to the very healthy condition of the flour trade in which a large amount of business has been transacted at moderate margins. One year ago No. 2 red wheat sold on the local market at \$1.83½ per bushel. Present Detroit prices are: Cash No. 2 red \$2.17; No. 2 mixed \$2.15; No. 2 white \$2.15.

CORN.—Corn prices on the local market show a general decline of 7@10c for the past week. Although the total corn supply of the country is sufficient to even force values below the present quotations, the scarcity of cars is such as to make it impossible to take care of the demand at points outside of the heavy producing sections. There has been no improvement during the past week, cold weather having added to the difficulties of the transportation men. While this cold weather is unfavorable for moving the grain, it is assisting materially in improving the keeping qualities of a large per cent of this year's harvest. Farmers would probably sell the grain in considerable quantities if interior elevators could secure cars for shipment. A year ago No. 3 corn was quoted locally at \$1.01½ per bushel. Last week's Detroit quotations were:

	No. 3 Mixed.	No. 3 Yellow.
Wednesday	1.95	2.00
Thursday	1.95	2.00
Friday	1.95	2.00
Saturday	1.95	2.00
Monday	1.95	2.00

Chicago.—January corn \$1.26½ per bu; May \$1.24½.

OATS.—Oats showed a small gain in values last week. Buyers have been active with considerable quantities going abroad. Home consumption of this grain is also on a large scale. Receipts have been very moderate. One year ago standard oats were quoted here at 57c. Last week's Detroit quotations were:

	No. 3 Standard.	No. 3 White.
Wednesday	81½	81
Thursday	81½	81
Friday	82	81½
Saturday	83½	83
Monday	82½	82

Chicago.—December oats 78c; January 78½c; May 75½c.

RYE.—Offerings have been small with some improvement in the demand which brought about an advance of one cent on the local market Saturday. Cash No. 2 is now quoted at \$1.84.

BEANS.—This trade is inactive with the price showing a small decline for the week. Cash beans are now quoted on the Detroit market at \$12.10 per cwt. In Chicago general conditions of the trade are unchanged. Supplies are increasing. Michigan hand-picked pea beans are quoted there at \$13.25 per cwt; red kidneys \$17 for fancy.

PEAS.—This trade is steady and slow, with field varieties quoted at \$6.50@7 per cwt. in Chicago.

SEEDS.—Supplies are scarce and the market is firm. Prime red clover at \$16.50; alsike \$14.25; timothy \$3.70.

FLOUR AND FEEDS

FLOUR.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Standard patent \$11.15; spring patent \$11.30; rye flour \$10.50@10.70 per bbl.

FEED.—In 100-lb. sacks jobbing lots are: Cracked corn \$81; coarse corn meal \$77; corn and oat chop \$60 per ton. (We have failed to secure satisfactory quotations on bran and middlings).

HAY.—In carlots at Detroit: No. 1 timothy \$24.50@25; standard timothy \$23.50@24; No. 2 timothy \$22.50@23; light mixed \$23.50@24; No. 1 clover \$19@20 per ton.

Pittsburgh.—No. 1 tim. \$29.50@30; No. 2 timothy \$27@27.50; No. 1 light mixed \$28@28.50; No. 1 clover mixed \$29@30; No. 1 clover \$29@30 a ton.

STRAW.—In carlots on track at Detroit: Wheat and oat straw \$10.50@11; rye straw \$11.50@12.

DAIRY PRODUCTS

BUTTER.—The demand for butter is rather quiet and market steady. Fresh creamery firsts 47½c; fresh creamery extras 49c.

Chicago.—A firmer feeling exists and prices are ½c higher. Creamery extras

49c; extra firsts 48@48½c; packing stock 33½@34c.

CHEESE.—Michigan flats 23½c per lb; New York flats 25c; brick 27¼c; long horns 27¼c; Michigan daisies 24½c; Wisconsin daisies 25½c; Wisconsin double daisies 25¼c; domestic Swiss 35@40c for prime to fancy; limburger 28@29c.

POULTRY PRODUCTS

POULTRY.—(Live).—The poultry market is active and prices higher. Offerings are not sufficient to meet the demand and everything of good quality is taken. Best spring chickens 26@27c; hens 20@26c; ducks 27@28c per lb. geese 26@27c; turkeys 30@31c.

Chicago.—(Live).—Offerings are liberal and everything in good demand except fowls. Fowls 18c; spring chickens 23½c; ducks 23c; geese 22@23c; turkeys, good 25@26c. (Dressed).—Fowls 23@24c; ducks, fancy 26c; geese 24c; turkeys 32@32½c.

EGGS.—Eggs are in good demand and market steady. Fresh firsts 50c.

Chicago.—Eggs are in small supply and prices are higher. Fresh Michigan firsts sell for 56@57c; ordinary firsts 52@54c; miscellaneous lots, cases included 50@55c.

FRUITS—VEGETABLES

POTATOES.—On Saturday the Detroit market ruled steady with Michigan round whites of good quality and in good condition selling at \$2@2.10 per cwt. The Cleveland market paid \$2.15 for the same grade of Michigan stock; Cincinnati market \$2.10@2.20; Pittsburgh \$2.25@2.30; New York \$2.25@2.37. The general tone of the potato market is steady. The federal government is undertaking a campaign to encourage the general consumption of potatoes which it is believed will give support to prices throughout the remainder of the season, despite any general improvement in traffic conditions.

CABBAGE.—Local trading in cabbage is very slow, in fact no sales have been reported here the past few days. At Cleveland Danish stock is bringing \$55 from jobbers; the Cincinnati trade is paying \$55@60; Pittsburgh \$47.50, while Chicago is giving \$40@42 for Holland stock.

APPLES.—The local market has been very dull during the holiday week. Prices are about steady with the best Yorks at \$5@5.25 and Greenings at \$3.75@4 for ungraded. The Pittsburgh market is steady, as are also Chicago, Cincinnati and Cleveland.

CHICAGO.

December 31, 1917.

Cattle were in such meager supply during the first half of Christmas week that in spite of the holiday and the general substitution of poultry for beef, pork and mutton, prices were largely 25@50c higher. Subsequently much larger receipts caused a reaction, and prices became largely lower, the better class excepted. The zone system has made further demonstration of its inefficiency as a supply distributor and price stabilizer. The receipts have run largely to short-fed steers, with not many steers selling below \$10 or above \$13, the better class of heavy steers going at \$13.75@14.25 and pretty good lots of steers taken at \$12.25 and upward, while a medium grade sold at \$11.25@12.20. Plain to fair light weight steers sold at \$10@11.20, common to plain steers at \$8.75@9.95 and inferior little steers to a limited extent at \$7.50@8.70. The best yearling steers found buyers at \$13.50@14, with good lots taken at \$12.30 and over and sales down to \$9@10 for the commoner lots. About all the steers marketed have had some corn, but the poor quality of the grain has made a poor grade of beef. The best demand is for cheap cattle, and killers compete with country buyers for steers on the feeder order. Butcher stock has sold especially well, cows going at \$6.90@10.25 and heifers at \$6.50@12.50, while cutters sold at \$6.40@6.85, canners at \$5.70@6.35 and bulls at \$6.50@12. Calves were active sellers at \$15@16 for the better class of light weight yearlings down to \$6@11 for inferior to good heavy calves. There was a moderate traffic in stockers and feeders, these cattle selling mostly at \$7.50@10.25, with a few inferior little stock steers taken as low as \$6.25@7.25. The outlook is better apparently for cheap and middling priced cattle than for the well-finished cattle. This is explained by the unwillingness of most people to pay the high prices asked in the retail butcher shops for choice cuts of beef.

Hogs underwent such good advances in prices recently because of small receipts that owners shipped in greatly increased numbers, and this enabled the packers and others to make purchases at much reduced figures for all

kinds. On some days stock trains loaded with hogs were slow in arriving, and on one day about 19,000 hogs had to be carried over to the next day, most of them getting in too late for the day's market. No large numbers of pigs were marketed during the week, and stock pigs were especially wanted, the best of these selling at a good premium. The government has been a big buyer of provisions, and recent purchases from fourteen large packers were the heaviest of any contracts made in the history of the trade. On the high day prime hogs brought \$17.30 but on Saturday hogs sold at \$15.75@16.80, comparing with \$15.50@16.85 a week earlier. Pigs brought \$11.50@15.50, while stock pigs brought \$14.75@15.50. Prime light hogs sold 10@15c below top figures.

Sheep, yearlings and lambs were marketed in quite moderate numbers last week, and after the Christmas holiday fat lambs sold higher under the influence of a good demand. The receipts ran mainly to western fed lambs with a few good-sized shipments of western yearlings and ewes. No important quotable changes took place in sheep or yearlings, but lambs advanced 40@50c and even more in some instances. Lambs closed at \$12.75@16.75, yearlings at \$11.50@14, wethers at \$11.40@13, ewes at \$5@11.75, bucks at \$7.50@9.50, breeding ewes at \$11@13 and goats at \$4.50@8.

Horses were in such unusual supply during Christmas week that buyers were unable to force a decline in prices, despite the limited general demand except for army horses. Farm chunks were quotable at \$60@150 for poor to good ones, drafters at \$185@265 and drivers at \$100@200.

LIVE STOCK NEWS.

Pretty nearly all of the remaining prime fat corn-fed heavy cattle, as well as about all of the prime little yearling steers and heifers, were marketed during the week of the International Live Stock Exposition, and since then there has been a beggarly showing of prime beefs. It is the prevailing practice upon the part of stockmen owning cattle to market them after a short feed or after a short warming up, and prices for prime cattle are little more than nominal. For instance, on the Monday preceding Christmas week there was one sale of prime cattle at \$14.50 per 100 pounds, and the next best sale took place at \$13.50. There are plenty of cattle in most feeding districts, but in average grading they are not any too good. Quotable changes of late have been mainly in a downward direction, with breaks of as much as 15 to 25 cents in a single day, and rallies now and then on smaller offerings. Quite recently many complaints have been made regarding the poor quality of the soft corn, and in numerous instances it is frozen and so bad that cattle will not eat it. Many farmers are salting their marketable grain when cribbing, and it has been found to keep well.

R. S. Elliott, of Simms, Montana, marketed in Chicago, a short time ago, a consignment of cattle and hogs, which included 65 head of cattle and 23 hogs, one of which tipped the scales at 773 pounds when loaded on his ranch. Mr. Elliott bought a section of Montana land a year ago last autumn and has almost paid for it from his crops and live stock. A good deal of irrigation is carried on in that part of the country, as well as considerable dry farming. He raises a great deal of wheat, and uses a tractor for plowing, having one field a mile long and plowing four rows at a time. Farmers are feeding wheat thereabouts to the live stock, there being no oats or barley. Hay is selling for \$25 a ton in Great Falls. Last winter Mr. Elliott paid as high as \$45 a ton for hay to carry his cattle through.

Vincent Pelzer, of Johnson county, Iowa, reports plenty of hogs feeding thereabouts, but fewer cattle than usual. There is an abundance of grain for feeding, but a shortage of roughage. The draft has taken so many farm workers that there is a serious lack of farm help.

The Janesville, Wisconsin, Commercial Club is distributing 110 head of breeding ewes among the farmer boys of Rock county in that state, the object being to encourage the sheep breeding industry. Great enthusiasm is shown by the lucky boys who will obtain the ewes, and more requests for ewes have been received than could be complied with. The ewes are being placed all over the county, going to 37 farms. Those securing them sign a note for one year, with six per cent interest for payment. The plan meets with general approval, and is highly commended by a prominent sheepman of Burlington, Wisconsin, who feeds over 20,000 sheep and lambs a year. There is a big crop of cattle and

hogs feeding in Jasper county, Iowa, according to B. C. Buck, of that locality, who marketed in Chicago recently two carloads of hogs of his own feeding after they had run in a corn field for two months. Corn is largely soft, but some cribbing has been done after the corn was carefully sorted, and it is thought the sorted grain will keep. There is a good outlook for a normal crop next spring.

Feeding districts generally are carrying plenty of cattle, and the disposition to market cattle fed on soft corn is quite general. In fact, hardly any stock feeders are willing to hold their cattle long enough to make them really choice, and so few prime corn-fed heavy steers and yearlings are marketed that prices for such grades are scarcely more than nominal. Most of the cattle marketed are short fed, and there is quite a showing of warmed-up stock.

The Soo Line has instructed its agricultural representative, R. J. Little, to encourage the farmers of northern Minnesota and Wisconsin to utilize their cut-over lands by starting in breeding a few sheep. The big ranchers are not addressed, as they are able to take care of themselves, but the small farmers are encouraged to breed at least a few ewes with the view of gradually increasing their breeding operations as they become expert in the industry. These lands are not valuable, and the sheep are well adapted for brush cleaning. A cooperative system of credits has been arranged whereby the business men of the community investigate the financial and business standing of the farmer, and, if found to be satisfactory he is recommended to the local bank for credit, his notes being vouchered for by business men. The plan is for the sheep to be set to work clearing up the brush lands at the start and then to sow tame grass seed. In the course of a year or two the land can be broken up for crops, and in the meanwhile the farmers can have a good cash return from their sheep, lambs and wool clips. Many farmers start in on too large a scale before learning how to manage their flocks, and this plan is discouraged by the best authorities.

Progressive farmer-stockmen are wasting no time in delaying engaging extensively in breeding hogs, taking heed of the request of the food administration bureau to increase the production of hogs at least 15 per cent. Many of them have bought good numbers of stock pigs for feeding, and this branch of industry has grown to large proportions. During the month of November about 246,000 head of stock pigs and hogs were shipped from the sixteen leading markets of the country to farming districts, comparing with only about 16,000 head shipped during the same time in 1916. These markets shipped out to feeding districts during the first eleven months of 1917 a total of 537,391 feeding pigs and hogs, comparing with only 144,596 for the corresponding time in 1916. There were thirteen other markets which made no returns a year earlier which shipped out 70,437 stock pigs and hogs to feeding districts during November. The corn states are full of soft corn, which can be utilized in no better way than by feeding growing pigs. At the present time farmers are marketing mainly hogs of only medium weight, the recent Chicago receipts having averaged 207 pounds, comparing with an average weight one year ago of 192 pounds, 189 pounds two years ago, 229 pounds three years ago and 215 pounds four years ago. Hogs are sure of being in active demand for a long time to come, and owners should watch the market closely and select a favorable time for marketing. In some recent weeks the market has been greatly overstocked, causing severe breaks in prices. Whenever the price has declined below the \$16 plane owners have stopped marketing freely. The domestic and export demands for provisions show no signs of falling off in volume, and there is no danger of producing too many hogs. Provisions have shared in the advance in hog prices, and within a short time pork has sold for \$46.50 a barrel, comparing with \$27.25 a year ago, with lard and other hog products showing similar advances.

The Canadian provincial governments are taking steps calculated to encourage farmers to engage more largely in breeding hogs. The province of Saskatchewan is anxious to do its part by assisting the farmers to buy breeding sows in the same manner it has been aiding in cattle breeding. The plan is for the provincial government to sell to farmers unbred sows at from \$10@20 per head below the prices of sows which have been bred. It is also planned to make sales of pure-bred yearling boars, including the Yorkshire, Tamworth and Berkshire breeds, to the farmers at as low prices as possible, as well as for the distribution of pigs after weaning at seven to eight weeks.

THIS IS THE LAST EDITION.

The first edition is sent to those who have not expressed a desire for the latest markets. The late market edition will be sent on request at any time.

DETROIT LIVE STOCK MARKET.

Thursday's Market.
January 3, 1918.

Cattle.

Receipts 1215. Market strong and 15@25c higher than last week on everything but canners, which are steady.

Best heavy steers \$10.75@11.50; best handy weight butcher steers \$9.75@10.50; mixed steers and heifers \$8.50@9.50; handy light butchers \$7.50@8; light butchers \$6.75@7.25; best cows \$8.50@9; butcher cows \$7@8; common cows \$6@6.25; canners \$5.25@5.75; best heavy bulls \$8.50@9; bologna bulls \$7@7.50; stock bulls \$6@6.50; feeders \$7.50@8.25; stockers \$6@6.75; milkers and springers \$6@9.

Bishop, B. & H. sold Newton P. Co. 5 cows av 1070 at \$8.75, 1 do wgh 850 at \$5.75, 8 cutters av \$78 at \$6; to Nagle P. Co. 17 steers av 1120 at \$10.50, 21 do av 1230 at \$11.50; to Garber 4 do av 982 at \$9, 1 bull wgh 1520 at \$11; to Hammond, S. & Co. 1 do wgh 1670 at \$9, 16 butchers av 572 at \$7.35; to Mich. B. Co. 2 steers av 875 at \$8.50, 3 cows av 1037 at \$8.50, 1 do wgh 930 at \$6.25, 2 do av 1085 at \$7, 2 steers av 875 at \$10.25, 2 cows av 925 at \$6, 8 butchers av 662 at \$6, 5 do av 900 at \$8, 4 do av 942 at \$9, 3 do av 753 at \$7; to Thompson 4 steers av 960 at \$10, 9 do av 894 at \$9, 10 do av 983 at \$10.50, 12 do av 990 at \$10.25; to Bresnahan 13 cutters av 950 at \$6.25, 19 do av 903 at \$6.35, 15 do av 890 at \$6; to Sullivan P. Co. 10 cows av 910 at \$7.25, 4 do av 745 at \$6.50, 3 do av 1013 at \$8, 6 do av 956 at \$7.75, 6 do av 1033 at \$7.85, 13 steers av 1115 at \$10.85; to Rattkowsky 13 butchers av 823 at \$7.50; to Ratner 3 bulls av 1200 at \$8.50; to Nagle P. Co. 3 bulls av 1370 at \$8.50; to Newton P. Co. 25 steers av 904 at \$10.60; to Kamman B. Co. 6 butchers av 918 at \$9, 7 do av 914 at \$9.

McMullen, K. & J. sold Thompson 4 butchers av 875 at \$9.40, 1 cow wgh 820 at \$7.50, 1 bull wgh 1180 at \$7.50, 4 cows av 1172 at \$8.25, 2 steers av 875 at \$8.75; to Hyman 7 butchers av 614 at \$7.40, 5 do av 658 at \$7.40; to Fine-man 4 do av 1050 at \$7.50, 4 do av 745 at \$7.25; to Bresnahan & K. 6 cutters av 900 at \$6, 4 do av 1042 at \$6, 3 do av 990 at \$6; to Sullivan P. Co. 4 cows av 1200 at \$8, 2 do av 1245 at \$6.50; to Parker, W. & Co. 18 butchers av 605 at \$7; to Mason B. Co. 4 steers av 947 at \$10.50, 1 cow wgh 1180 at \$10, 1 bull wgh 1490 at \$9; to Newton P. Co. 1 do wgh 930 at \$6, 4 cows av 947 at \$7, 2 do av 1125 at \$8.50; to Mich. B. Co. 4 steers av 760 at \$9, 5 do av 760 at \$7.25, 4 do av 1107 at \$10.50, 1 bull wgh 545 at \$6.75, 1 do wgh 1100 at \$7.50, 1 cow wgh 1300 at \$7.25, 3 do av 1010 at \$8.25.

Erwin, S. & J. sold Mich. B. Co. 27 steers av 1040 at \$10.60, 2 cows av 1085 at \$6.50, 10 butchers av 750 at \$7.80, 5 steers av 896 at \$9, 2 bulls av 1085 at \$8, 4 steers av 950 at \$9.75; to Newton P. Co. 2 cows av 705 at \$7.50, 3 do av 1017 at \$7, 6 canners av 916 at \$5.75, 1 bull wgh 1080 at \$8.50, 5 do av 834 at \$8.50, 8 butchers av 747 at \$8, 6 cows av 1000 at \$7.50, 1 do wgh 950 at \$6.50, 11 steers av 1057 at \$11, 2 do av 1000 at \$9; to Bresnahan & K. 2 oxen av 1440 at \$6.50, 6 canners av 380 at \$5.85, 8 do av 325 at \$6; to Rattkowsky 5 butchers av 460 at \$6.50, 7 do av 700 at \$8, 4 do av 575 at \$6; to Kamman B. Co. 6 do av 900 at \$8, 1 bull wgh 1140 at \$8.25.

Veal Calves.

Receipts 576. Market easier. Best \$16.50; others \$8@15.

Erwin, S. & J. sold Hammond, S. & Co. 3 av 155 at \$17, 2 av 95 at \$12.50, 3 ac 100 at \$17; to Thompson 5 av 145 at \$17, 4 av 140 at \$16.50, 5 av 140 at \$12, 5 av 140 at \$17; to Newton P. Co. 14 av 125 at \$16.25.

McMullen, K. & J. sold Hammond, S. & Co. 2 av 205 at \$9, 10 av 126 at \$16.50, 16 av 150 at \$17.

Sheep and Lambs.

Receipts 438. Market strong 25@50c higher than last week. Best lambs \$17; fair lambs \$16@16.50; light to common lambs \$14.25@15; fair to good sheep \$9@11.50; culls and common \$6@8.50.

Bishop, B. & H. sold Mich. B. Co. 10 lambs av 78 at \$16.75, 16 do av 80 at \$17, 56 do av 80 at \$17, 6 sheep av 95 at \$8.50, 56 do av 95 at \$11, 41 lambs av 65 at \$16.50.

Sandel, S. B. & G. sold Mich. B. Co. 23 lambs av 78 at \$16.50, 3 do av 95 at \$16.50, 2 do av 70 at \$16.50, 3 do av 95 at \$16.50, 1 sheep wgh 150 at \$11, 2 do av 140 at \$10.50, 29 lambs av 80 at \$17.

Hogs.

Receipts 4042. Market dull with hogs 15@25c lower than Wednesday, and pigs 25c lower. Pigs \$15.75; mixed grades \$16.50.

Make Your Soft Corn Yield Maximum Profits

THERE SEEMS TO BE only one solution of the soft corn problem—and that is to feed your corn this year to hogs or cattle as fast as possible.

MANY WHO CRIBBED IT find it spoiling on their hands—a serious loss.

THOSE WHO DECIDED to feed it out quickly and added as many animals to their feeding flocks as their corn crop would warrant, will reap the biggest profits.

THEY ARE ACTUALLY turning loss into profit, PROVIDED, they do not overlook one very important factor which is doubly essential under present conditions.

AND THAT IS THE HEALTH OF THEIR STOCK. Under these forced feeding conditions, and the great dangers always attendant when feeding new corn, especially soggy, soft corn, the liability to disease and sickness is enormously increased.

THE EXPERIENCED FEEDER knows this and this year especially he will feed a good dependable live stock conditioner and worm destroyer.

HE WILL DO THIS as a preventive measure—an insurance against losses, which he knows, if they get a start will be even greater than if he had suffered the loss of his corn crop through spoilage.

AGAIN, A GOOD CONDITIONER will increase the food value of even poor corn. It will enable the animal to get more good from it—keep the digestive system in better condition,

regulate the bowels and above all, destroy the poisonous, disease-breeding, destructive worms which are always more prevalent when soft or immature corn is fed.

SAL-VET is your safeguard. It is a tried and proven conditioner and worm destroyer. It is not a new, experimental remedy. It has saved more live stock—prevented more live stock losses—proven its worth to more live stock owners, than any similar remedy ever offered to the American farmers.

FARMERS EVERYWHERE are buying it now in double the quantities due to the soft corn situation. They realize it is doubly important to feed SAL-VET now and that it is the best and cheapest insurance they can buy.

ITS BASE BEING SALT, to which are added the necessary medicines to destroy stomach and intestinal worms—regulate the bowels—purify the blood—tone up the animals generally, makes SAL-VET the ideal preparation to feed regularly with soft and soggy corn.

SAL-VET COSTS SO LITTLE you cannot afford to risk even the slightest losses. It will repay its cost many times over in faster gains, thriftier growth, healthier stock. It will save its cost by saving feed.

ASK YOUR DEALER about it. If he cannot supply you, write to us. Don't put it off—your risk is too great. Write for a copy of our New Live Stock Book; it is free and contains much valuable information.

"After all other remedies had failed SAL-VET destroyed the worms in our horses. I consider that it keeps the digestive organs in good condition and does better work generally than many other remedies."

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O. I. C. & CHESTER WHITE SWINE. Strictly big type with quality. Have a choice lot of hogs fit for early fall service. These hogs will be sold worth the money. Also have some fine gilts. I will ship C. O. D. NEWMA'S STOCK FARM, R. 1, Marlette, Mich.

O. I. C.'s: Registered serviceable hogs. Bred gilts. Aug. Sept. Oct. pigs. Registered Shropshire and Lancs. G. P. Andrews, Dansville, Mich.

O. I. C.'s: A few prize winning gilts at Michigan State Fair; also Aug. Sept. pigs of the best blood lines. Clever Leaf Stock Farm, Monroe, Mich.

O. I. C. Am offering some good hogs of May farrow and fall pigs either sex. C. J. THOMPSON, Rockford, Mich.

O. I. C. For sale a few extra good gilts bred for March and April farrow. H. W. MANN, Dansville, Mich.

BOARS-SOWS

Big type big bone. For the next 30 days we will sell Big type Poland Chinas at bargain prices. April boar weighing 300 lb. Open gilts. Summer and fall pigs everything goes. Get busy. J. C. BUTLER, Portland, Michigan, Bell Phone.

LARGE Type P. C. Largest in Mich. Spring Boars ready to ship. The kind that make good. Come and see the real big type kind. Expenses paid if not as represented. Free delivery from Parma. W. E. LIVINGSTON, Parma, Mich.

Big Type Poland Chinas: April and May pigs, healthy and growing. Prices right. L. W. BARNES & SON, Byron, Mich.

LARGE Type P. C. Some growthy spring Boars and L. gilts ready to ship, come and see them. Free delivery from Augusta. W. J. Hagelshaw, Augusta, Mich.

LARGE Type P. C. Some good spring boars up to 270 lbs. Will also price gilts, open or bred. Fall pigs ready to ship. Wm. J. Clarke, R. 1, Mason, Mich.

Big Boned Poland China boars shipped C. O. D. call or write for photo, weights, pedigrees and prices. E. R. Leonard, R. 3, St. Louis, Mich.

Walnut Alley big type P. C. boars that represent the best breeding of Iowa at 1/2 their value for the next 30 days. (Two that are extra.) Ionia, Mich. A. D. GREGORY.

LARGE STRAIN P. C. nothing for sale until after Dec. 1st. H. O. SWARTZ, Schoolcraft, Mich.

Big Type P. C. Big boned fellows from Iowa's greatest herds. Special prices on spring boars. E. J. MATHEWSON, Burr Oak, Mich.

POLAND CHINA GILTS Bred for March and April farrow. G. W. HOLTON, R. 11, Kalamazoo, Mich.

P. C. Bred sows, big type, big bone, big litters big fall pigs. In pairs, or trios. Saline, Mich. R. W. MILLS.

Big Type P. C. bred for March & April farrow sired by Peter's Jumbo & Grand Superba and 2 or 3 yearlings at bargain prices. C. E. Garnant, Eaton Rapids, Mich.

Registered Hampshires, spring boars and gilts. JOHN W. SNYDER, R. 4, St. Johns, Mich.

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CHOICE BRED EWES

250 left, 1 to 4 years old, bred to good Shropshire rams. \$13 to \$16 each for 10 or more, if taken soon. ALMOND E. CHAPMAN, Se. Rockwood, Mich.

FOR SALE

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Hillcrest Farm, Kalamazoo, Mich.

EWES: Hamboulllets and Hampshires for sale. A. A. WOOD & SON, Saline, Mich.

Western Ewes bred to Registered Mutton Rams. BARNARD SHEEP RANCH, R. 5, Clare, Mich.

Shropshire Ram, Lambs and one three year old flock header for sale. ARMSTRONG BROS., R. 3, Fowlerville, Mich.

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Musky ones with quality, price \$35. Shipped C. O. D. Kope Kon Farms, Sheep at Lupton address Coldwater, Mich.

Registered Oxford Ram and Ham Lamb. Also Berkshire hogs. CHASE STOCK FARM, R. 1, Marlette, Mich.

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REGISTERED PERCHERON Mares and Stallions priced to sell. Inspection invited. L. C. HUNT, EATON RAPIDS, MICH.

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For Sale Percheron Stallions black No. 12705 foaled June 23, 1915, No. 13193 foaled June 29, 1915. J. F. GLADY, R. 7, Vassar, Mich.

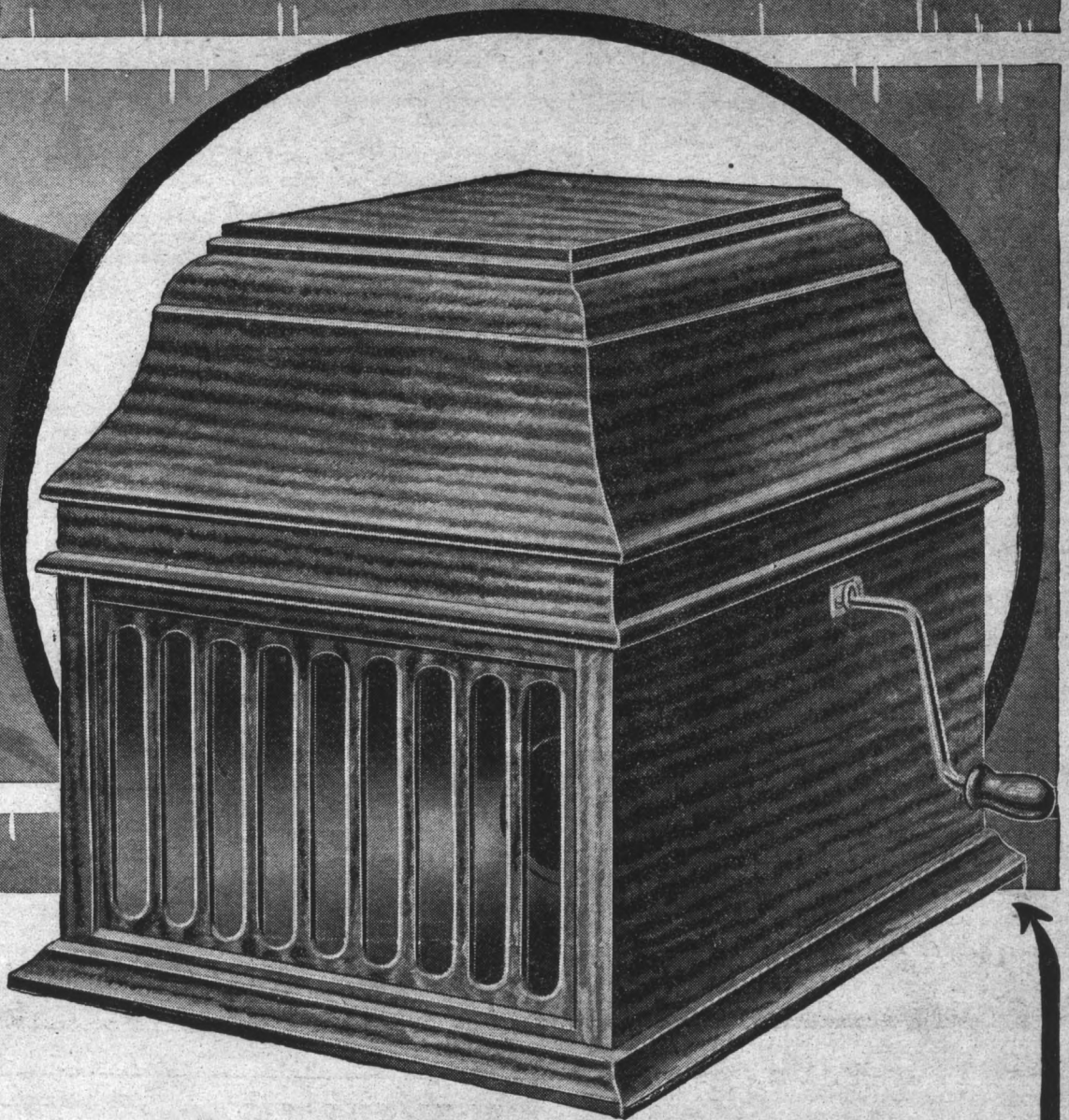
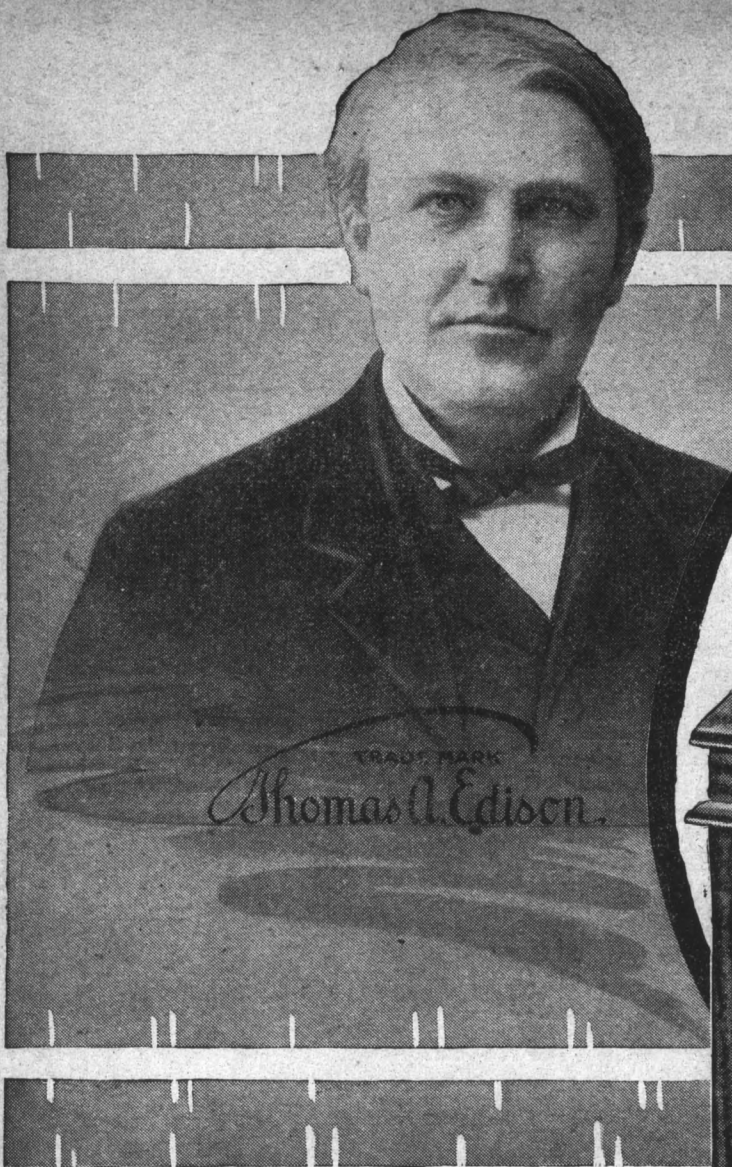
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