vast influence not to be measured by a mere difference in the method of trade. Labor formerly was of equal value with land itself in the calculations of the agriculturist. Now the new factor, capital, has entered in and labor must share its place with capital. Too few farmers of great knowledge and venerable experience realize the potency of capital as a factor in successful farming. Money lying idle in the bank at low rates of interest is too frequent, when at the same time it could be made to return double the interest if made productive by use on the farm. No single factor stands out more clearly or with more startling significance in regard to the need for capital in successful farming than the fact that our farmers as a whole are men of small capital and small incomes. This is appreciated and becoming more so by virtue of the greater interest and development of co-operation and a steadily increased agitation for a better system of rural credits. The steady stream of young men and women leading from the farms to the city also bears eloquent testimony to the truth of this statement. Capital means larger farms, larger machinery, greater scope for managerial ability, and with almost invariable truth (equal knowledge being granted), a corresponding increase in labor income—the indicator of agricultural success as measured in business terms.

Many of our farms are mortgaged, and mortgages disappear so slowly. It is so much like advancing two steps and slipping back one. Warren has said, after the most extensive investigation among thousands of farmers in the United States, that if a man has less than five thousand dollars in cash when he starts farming he can make more money if he rents than if he buys. Why? The answer is simple. His capital is all productive. It is not tied up in buildings and useless machinery. It can all be used. Think it over. How many successful men in your neighborhood who have not inherited their farms (most of them have, no doubt, and that is both the curse and the blessing of farming) have rented and then bought as their capital grew.

But we must hurry on for a word or two about "love of calling." Does John D. Rockefeller love money for what it can buy or does he love the making of it; the struggle of the world of big business and the chance to pit his keen and fertile brain against those of his competitors? Money itself can no longer mean anything to him. Would it mean anything to you if you had to pay an enormous sum yearly to someone to help you spend it? Money is not the reward of his labor if we judge rightly; it is but the symbol. And so with many "big business" men, we believe. Some struggle for power, some for preferment, (hereditary titles possibly) and doubtless many also for money itself, with its fascination and glittering possibilities. Many there are, and among them the most successful, who work because they love their work and, because they do love it, is due in large measure, their success.

And so with farming. Farming is hard manual work, and farming is, for most men, poorly paid work. But it is nice work and has attracted with strong bonds some of the world's greatest men. The successful farmer must love his work or his success will be limited. Knowledge, Capital, and Love of Calling, these three. "And the greatest of these?"—It depends upon your viewpoint.

# Automobiles, Farm Machinery and Farm Motors.

## The Care of the Wheels.

A prominent business man who is engaged in the manufacturing of food, purchased a car the other day for use in his business. He stated very plainly that he not only did not know anything about an automobile, but that he never intended to gain even the slightest knowledge. He wished to have the machine work for him and it was certainly not his idea to work for the machine. We told you in a recent article that it should be the purpose of every motorist to look after his automobile as much as possible, in order to save mechanical labor at the garages. Any surplus thus made available could be utilized for the necessities of the fighting front. In the case of this manufacturer, however, his time is being given wholly to the production of food and so there is some reason why he should not know anything about a car and depend entirely upon garage labor. Even in an instance of this kind, nevertheless, an exception must be made. Anyone who goes out on the road should know how to look after the wheels, because lack of knowledge in this particular often means a great loss of time. Practically everyone uses wheels of artillery type and the vast majority employ what is known as demountable rims. The spokes of the wheels meet in the centre and are bolted between the flanges of the steel hub. Upon the rear wheels are mounted brake drums for the control of the momentum of the car. There is a steel band or felloe upon the outer wooden rim of the wheel and it is upon this felloe that the demountable rim containing the tire is carried. The only attention the spokes and hubs require comes under the head of cleanliness. Get as much freedom as you possibly can from mud and oil. If the bands of the brake upon the drums of the rear wheels are squeaky or have a tendency to become very hot, it is an extremely easy matter to mend, loosen or tighten them as the occasion requires. In the instruction book that goes with your car the nuts for adjustment are always clearly indicated.

The value of the demountable rim comes from the fact that in taking it off you can remove the tire without deflation. Of course it follows that you can put on a new tire and rim without inflation. This rim is in most cases a split steel band, held in position by five or six bolts and tapered wedges placed at equal intervals about the circumference. Taking it for granted that you carry an extra rim with tire and tube attached, let us suppose you meet with a puncture upon the road. Get out your demountable rim wrench from the tool kit and loosen all the bolts except one on either side of the valve stem. Do not stop loosening the bolts until the wedges can be swung out between the felloe band and the demountable rim. We advised you to first loosen these bolts, because while the wheel is firm on the ground it is easier to operate upon it than when it is jacked up and movable in the air. Having loosened all the bolts, except the two mentioned, put a jack under the axle and raise the punctured tire off the ground. You can now loosen the two remaining bolts, one on either side of the valve stem. Your next operation will be to unscrew the valve stem cap and the small nut on the base. This allows the valve stem to come through the hole of the wooden rim and the felloe band. Your next move is to insert the point of your tire tool between the rim and the felloe band opposite the valve stem. Having carried out this movement, you are now able to pry the rim off. You will next find it necessary to take the spare rim or tire from its position on the rear or side of your car and put in its place the one that has just been removed. Following this step turn the wheel round until the valve stem hole is on top. Now you can very easily put the valve stem of the spare tire through the hole and slip the spare demountable rim upon the wheel. Sometimes it may be necessary to kick the rim into place but this action cannot do any damage.

Having put all the wedges back into position, partially tightening the bolts, you can remove the jack and allow the wheel to rest on the ground. Then go over all the bolts again, tightening them until they are absolutely and firmly in place. It is a good idea to use the emergency brake to keep your machine steady while changing tires, and should your puncture take place upon sandy or muddy ground you will find it very advantageous to use a plank on which to place the jack with which you raise your axle.

Should you have an occasion to put a tire and tube upon a rim, you will not experience as much trouble as you may imagine, because there is a very handy steel tool which shortens the circumference of the rim. This allows the tire and tube to go on very easily. After they have been placed in position the rim is allowed to assume its normal circumference. Sometimes it may be necessary to exert a little force to have the points of the rim come together, but this should not occasion any serious inconvenience.

If you want to take a rim out of the tire put the rim and tire flat on the floor. Remove the anchor plate and insert the sharp end of the tire tool under the bead of the tire at the point where the rim is split. You can now gradually pry the rim away from the tire.

You should at least know how to handle the wheels of a motor car or otherwise the most simple operation may keep you from enjoying the greatest possibilities of automobiling.

## Storage and Wet Battery.

1. What metals are used for plates in a storage battery?
2. Could a satisfactory storage battery be made at home?
3. What plates would be suited, using sulphate of copper as an acid in a wet battery?
4. What acid would have to be used for plates made of zinc and carbon?
5. Could a wet battery be used to start a twelve h.-p. gasoline engine?

Que. J. R.

Ans.—1. Both plates in a storage battery are of lead or composition of lead.
2. No.
3. Copper and zinc.
4. Salammoniac, or to give it the common name, ammonium chloride.
5. Yes. W. D. HAY.

# THE DAIRY.

The world's record for eleven-year-old cows is held by Doede Binnema Flora, with 28,857 pounds milk, 1,257.07 pounds butter in one year.

The thirty-first black-and-white forty-pounder has risen from the ranks, according to the Secretary of the Holstein-Friesian Association of America.

It is usually more satisfactory to keep the young calves indoors during the summer months. Flies annoy them seriously and the hot weather in addition will prevent their most favorable development.

Ayrshire Advanced Registry testing during 1917, in the United States, was carried on in 105 different herds in 26 States in 1916. The increase in A. R. certificates issued during the year was 10 per cent.

While good alfalfa hay is beyond doubt the best dairy roughage for milk production, red clover, on account of its very general use, is the most important, and abundant supplies should be assured for next winter.

Canary Paladin Vale has just made a new world's record as a twelve-year-old both for milk and butter. She has to her credit 35.22 pounds butter, 810.3 pounds milk in seven days; 131.31 pounds butter, 3100.2 pounds milk in thirty days.

Jno. D. Rockefeller has made his first venture into dairying we hear. He is evidently going to make it pay from the start, since he only bought 3 pure-breds to start with, thereby emulating the example of successful milk producers who find it wise to build up gradually.

There are great possibilities for profitable milk production from the thousands of grade dairy herds throughout the country. Careful grading up, however, is necessary to secure best results. A grade cow in the United States is recently reported to have produced 660 pounds of milk containing 25.959 pounds of fat under official test in seven days. Hitch your wagon to a star.

The American Ayrshire Association have raised the Advanced Registery requirements for production and the new requirements went into effect on March 1, 1918. The following summary of 90 records completed just prior to the enforcement of the new regulations, in comparison with the new standards for each class, show the relation between what Ayrshire A. R. cows have been doing and what they must do to qualify.

| Completed Records | | | New Requirements | | |
|---|---|---|---|---|---|
| Class | Milk | Fat | Class | Milk | Fat |
| Mature | 11,488 | 452.25 | Mature | 9,000 | 360.0 |
| 6 Sen. 4-yr. | 10,788 | 439.58 | Sen. 4 | 8,500 | 341.8 |
| 6 Jun. 4-yr. | 10,188 | 447.75 | Jun. 4 | 8,000 | 323.5 |
| 10 Sen. 3-yr. | 9,020 | 357.01 | Sen. 3 | 7,500 | 305.3 |
| 9 Jun. 3-yr. | 9,352 | 383.88 | Jun. 3 | 7,000 | 287.0 |
| 13 Sen. 2-yr. | 8,198 | 340.17 | Sen. 2 | 6,500 | 268.8 |
| 11 Jun. 2-yr. | 7,951 | 322.30 | Jun. 2 | 6,000 | 250.5 |
| 90 Total | 9,959 | 401.61 | | | |

Average per cent. of fat, 4.03%.

An illuminating example of the wonderful capacity of dairy cows and their extraordinary ability to turn coarse roughages into valuable human food, is the performance of a pure-bred kept under test by the University of California, for experimental purposes. This cow, Bess Fayne Concordia, has been fed nothing but alfalfa hay for several years, and of this feed she is stated to have consumed an average of 60 pounds per day and produced 50 lbs. of milk daily for seven days.

## National Dairy Conference at Chicago.

The importance of dairy products as food generally, and the very critical situation which has developed in every industry as a result of the war, led up to a conference of all the allied associations and industries of dairying in the Unites States, which was held in Chicago, on April 12 and 13. Representatives of the National Dairy Council, the National Milk Producers' Association, the National Dairy Union, the American Association of Creamery Buttermakers, the National Creamery Buttermakers' Association, and the International Milk Dealers' Association, were all present at this conference and the dairy industry was gone over very thoroughly with a view to bringing about as nearly as possible a correct understanding of all matters pertaining to the industry and its relation to the all-important question of food economy.

The president of the Holstein-Friesian Association of America was chairman of the conference, and the producers, represented by Mr. Campbell, President of the National Milk Producers' Federation, discussed the situation from the standpoint of the milk producer, it being stated at this time that milk producers should pay much more attention to questions of publicity than they have been in the habit of doing in the past. The possibilities of the dairy industry can never be fully realized until the consuming public are made acquainted with the food value of pure dairy products. It was suggested that the milk producer can well afford to pay a revenue of one cent, or thereabout, for each 100 pounds of milk he produces, in order to raise a sufficiently large sum of money to put before the public in a con-