

THE FARM AND GARDEN.

Plows and Plowing--A Revolving Plow-Fender.

The Use of Cast Steel in Place of Iron--Sward-Plowing.

Sulky Gang Plow and Riding Cultivators--The Chemistry of Farming.

From Our Agricultural Correspondent
CHICAGO, Ill., Feb. 10.

There is much inquiry in regard to
PLOWING AND PLOWING.

Many of these have had replies by mail, but of late they have become too numerous to admit of this, and we will take up the subject from the present standpoint. This is done the more willingly on account of the thousands of new readers of THE FARMER who have not been posted on this subject, and yet I must confess that there are some new things that I desire to take into consideration.

In purchasing a new stubble-plow, the first thing that the farmer looks at is the height of the beam from the ground, that the rubbish may be cleared from it, and not choke up. The other day, Major Webber, a farmer of Marshall County, showed me a little simple contrivance, that he calls a revolving fender, that will clear all the rubbish, weeds, stubble, wild morning-glory, vines, and all that sort of trash, from the plow, even when the beam is low, or just high enough to clear the furrow-edges. But this is only one of its advantages, for it will allow of a shorter standard, and this will reduce the power to move it; as every farmer knows that a low-beam plow has a lighter draft, is held easier, and is the best in all respects, in land clear of rubbish, that is liable to choke it up. Here, then, is a point for improvement in the weight of the plow, for two reasons: In the first place, a low-built plow will bear a greater resistance than the high-built; consequently, it can be made lighter, and, of course, cheaper, for it will require less pounds of iron and less size of wooden beam. And this leads us to the inquiry, Why by not use all cast steel in the construction of our plows? Cast steel is a great deal stronger and stiffer than iron, and could be used of much less size for the same purpose. The large bolts that pass through the beam weaken it in a ratio corresponding to their size; hence, the smaller the bolts, the smaller may be the beam. If you can reduce the bolt one-fourth of an inch, you may reduce the thickness of the wood that amount. If cast steel costs more per pound than iron, it will require less pounds for the same work, and then the cost of the wood is also reduced. Cast steel is now being used for harrow-teeth, as it is found that the size of the harrow-teeth may be much less, and the harrow may have a wider spread without adding to the weight, and is thus enhanced in its capacity for work. Our plows are all too heavy; but, with the use of iron, it has been found difficult to make them lighter and yet have them capable of all the resistance that they meet in striking stubble, boulders and roots. The use of cast-steel would make a most decided change, and more especially when we are enabled to lower the beam from four to ten inches,--a point of no small consideration.

Last November I was in the shop of Furet & Bradley, of Chicago, when they were forging hundreds of iron beams for plows; as it is less since seemed to me that, if these beams had been made of cast steel, the weight might be reduced several pounds each, and yet the beam be less liable to break or bend than now. The fact is, the new progress for the cheapening of steel are gradually drawing us on to the use of steel in place of iron, and we will soon enter the age of steel, and substitute it in all cases for wrought iron. While these remarks apply to the common old land and sward plows, yet they have a double force in the sulky or gang plow.

The following letter is a fair exponent of what farmers now demand.

FRANCIS FLEMING.

St. Louis, Mo., Jan. 10, 1876.

Sir: Have you brought plow-iron, and, if so, in what quantity, with any of the sulky or gang-plows advertised to do such work? Very few farmers think about trench-plowing, but, I believe, some have described the plow you used. I have trenched liberally and cleverly and with a plow fitted in front of a common stubble plow, but was not entirely satisfied with its operation. I want to get a sulky plow fitted for trenching, and, with the same plow for old ground. Can it be done? I have trenched considerably by getting two in the same furrow with the same beam; viz., the one in front, the other behind. The latter is a gang-plow, and I believe, a better one than any I have used. I want something which three horses can carry right along. Have you any experience in these plows that will benefit me in starting a new garden? In the same manner, also, have you any of the best of the kind of sward plows for cultivating land? If so, how do they perform, compared with walking cultivators? J. H. A.

All of the gang plows are made too heavy; there is too much weight to carry; and then four horses make one horse too many for one man to handle in plowing. We must have the plow adapted to the beam, for we cannot so well adapt the beam to the plow. When two plows are attached to the same beam and drawn by four horses, each plow must have double the resistance of a single plow drawn by two horses; hence, the gang plow must be twice as heavy as the single plow, and this double strength implies double the material; and thus we have double the weight of two common plows, in order to get a gang plow. That is, we must have four plows, or their equivalent, in order to do the work of two. And this extra weight has been the great stumbling-block in the introduction of this kind of plow. And, unless the defect can be overcome, they will not come into general use. Last fall, a manufacturer proposed to send me, for trial, a sulky plow cutting twenty inches, to be drawn by three horses or four. Do not send it, I said, for I can point out to you its defects without a trial. In the first place, no furrow-edges should be more than one foot wide, as all over that width must be elevated at a greater loss of power, and a twenty-inch furrow will require as much power to turn it as would two twelve-inch furrows. That is not possible, for, with the plow, you have to open two furrows, which will fully compensate for the extra power to raise the wide furrow; so, you see, there is no loss. But the opening of the furrow-edges with a rolling cutter is at a very small expense of power,--a mere trifle as compared to the elevating of a wide furrow in order to invert it. It was for this reason that the old wide prairie breakers went out of use. It is a very pretty, though fallacious idea, that three horses, with a twenty-inch plow, have any advantage over the common mode of plowing, or of a sulky plow with two plows of twelve inches each. In light soils, the latter will be found of great value, for then three ordinary horses or oxen will be able to work it, without more than the usual fatigue; but, in a heavy clay soil, such as we often find on the prairie, it will need three heavy horses to do the work. Nearly all of the gang plows are made with two fourteen or sixteen inch plows. These wide furrows, added to the great weight of the frame and attachments, drag out the team, and the farmer finds that his anticipations are sadly cooled off. The truth remains that, to turn over a given furrow it requires a given amount of power, and that two furrow plows of a foot each will require less power than one of two feet.

Since the plow trial at Mattoon I have not had an opportunity to test the relative merits of the different gang plows, but I know that the Skinner's plow has been much improved since then. These gang plows can be, and I believe, all are, arranged for either trench-plowing or swarding, by placing one plow behind the other on the same beam. What we need is a sulky plow, with a single plow, made as light as is consistent with the requisite strength for the turning of a single furrow. I think the gang-plow should be made for the use of three horses, and the two plows of a corresponding width, not to exceed twelve inches each. As before stated, they may now be made with low beams, and, by using steel, the weight could be materially lessened. Three horses work very well together, and such a team would do a third more work than the team of two horses, that saving one-half of the labor of one man. This, in a short time, would pay the difference in cost between a sulky gang-plow and the common walking plow.

SWARD-PLOWING.

I now trench-plow all my sward-land, and, what is more, I try to do it as soon as the frost is out of the ground, and the surface is firm enough to bear the team. If the water follows the furrow, no matter for sward-land plowed in this wet condition will never hard, though the same soil, after the turf has become spongy, would do so. I have before explained the reasons of these apparent contradictions. The top furrow need be no more than two, or at most three, inches deep, and the bottom one three or four,--the two making not more than six or seven inches, though some think five quite sufficient. The top furrow is a good drainage, while the bottom furrow that has been thrown out on this turf is made permanent and in some condition for the roots of the young plants. The gang plow fitted up as a trench-plow will do better work than to use two sward plows in the usual manner, for the reason that the weight of the implement and the driver will lead the forward plow to its place, and a more even and lighter furrow can be cut, for it is desirable to have the turf cut as thin as possible, but below the crown of the grass roots. For this purpose, an inch and a half is better than two inches. This shallow cutting of the turf is exactly the secret of success in the trench-plowing of sward-land, for it separates the plowing from the roots, and the turf is at once destroyed. This thin plow of turf is placed at the bottom of the furrow and is capable of setting up new blades. It is better furrow that contains the dead parts separated, is soon consumed, and the sward matter supplies plant food, and,

by its porosity and color, admits air and attracts heat, while the rain-fall readily passes through it. Land thus prepared is especially adapted to corn, oats, and clover. For getting wheat and barley, the land must be plowed the previous autumn, while potatoes do either better on such land the second season, though I have had good crops the first year. I now make it a rule to stop breaking sward-land as soon as it becomes dry; for, in that condition, it requires nearly double the power to do the work. I allow the weather and the condition of the soil to be the arbiter of my corn crop. Last year I plowed sward-land, all old land, but no sward was broken, for the reason that it was too dry. Had there been heavy rain-falls, so as to stop work on the old land, the teams would have been put at trench-plowing of either prairie or stubble sward for corn. I hold this sward-land in reserve for this purpose; for it is often the case that we cannot plow our old land for weeks, when, without this sward-land, the teams must be idle; and, besides this, in a wet season sward-land thus treated will produce more than old land, which, in a dry season, it is the reverse. This system of preparing land for corn must come into general use in all the prairie country, when we shall have a rotation of grass, corn, and the small grains. That a three-horse sulky gang-plow must play an important part in this programme is also certain; but these plows must be made lighter than at present, and the plows used must be reduced in width.

The double Michigan plow went out of use on account of the power required to draw it; but it did the work in the best manner, and to it we are indebted for the idea of trench-plowing. I have no doubt that a modification of that plow, combined with such a sulky plow as that of Skinner's, would be found useful for this purpose. We may look for improvements in this new style of plow, in order to better fit them for sward-plowing, for which they are especially adapted. So soon as they come into more general use, the price will be materially lessened. A boy of fifteen years can drive a good sulky plow all day, and do as much work as a man with a common walking plow; while, with the walking plow, he could neither do good work nor a day's work. One of my neighbors has used one of these sulky plows four years, in all kinds of work, and would not think of doing without it. The wheels of this plow are too small, and the whole is unaccountably heavy; yet he contends that the draught is little, if any, greater than with a common plow. With first-class timber and cast steel, these plows may be made so light and so cheap that they will come into general use.

For the past two years the demand has been for walking cultivators, mainly from the fact that sulky cultivators cost too much, and I predicted that, as soon as this objection was removed, they would again come into general use. I have letters from several manufacturers, who say they have accomplished the desired result, and that riding cultivators will be put on the market at an advance of from \$5 to \$10 over the walking cultivators, and that the demand from dealers is larger than usual. So much for a reasonably cheap article. The fact is, with care at the present rates, farmers cannot afford to pay \$10 or \$15 for a sulky cultivator, when \$20 or \$25 will buy a walking one, and the same holds good, to some extent, with the sulky plow. A good single sulky plow, with rolling casters, costs \$20, while a first-class walking plow, with rolling casters, costs about \$25.

THE CHEMISTRY OF FARMING.

We have placed too much reliance on what chemists have taught us in regard to manures, and their possibilities for plant-food, and have lost sight of the effect of the mechanical condition of the soil. I have the analysis of the soil of this farm, and also of soil from the Rocky Mountain district, taken from a garden in Greeley. One appears like a friable clay loam, while the other is a coarse, sandy soil. On analysis, they both present the same amount of silica, and only differ in the quantity of alkalis. In one the silica is in the condition of a firm powder, as shown under the microscope; while the other is a coarse sand. In some of the minor details, the analysis is not complete, but will be in the course of a few days. These experiments, as thousands of others do, show that it is not so much the elements of a soil, or its mechanical condition, that makes it of more or less value. For this reason, we want a plow that will do more than simply turn over the furrow-edges; one that will consolidate it at the same time. We must apply our chemical science with the aid of natural philosophy and vegetable physiology. Last week, a farmer assured me that all there was required to make a pasture rich in white clover was to sow on plaster, for then the clover would come in, anyhow, or so seedling would be required. This is of a piece with manuring with iron filings, in order to supply the plants with iron, as dozers supply iron to the blood of invalids. The best things are good when mixed with shippings of wool and hair,--the more of the latter, the more valuable for plants. So of iron tannin, which are good for the blood in connection with beefsteak and other food. The science of farming must be an applied science from the farmer's standpoint.

RURAL.