

## Farm Machinery.

In our modern industries, machinery has played an important part; but probably in no department of work has this factor been more productive of beneficial results than in agriculture. Machinery and implements have been invented for every conceivable work on the farm, and the elaborate and varied utensils employed by the farmers of to-day are in strong contrast to the crude inventions that were in vogue forty years ago. They are also in strong contrast to the agricultural implements that are employed by farmers in many other countries at this time. The Americans, in this respect, have far outstripped all other nationalities. Five new agricultural implements for reducing farm labor are manufactured in this country to every one made in any other land. At the World's Fair, one of the most interesting and instructive features is the large collection of farm machinery which has been invented and manufactured in this country within the last half century. Nearly nine-tenths of this machinery will bear the stamp of American genius.

The proverbial "hard toil" of the farmer in the fields is rapidly becoming only a figure of speech. There will, of course, always be plenty of work to do in cultivating the soil; but with the modern invention of machinery this is greatly lessened. Our early New England forefathers gathered their crops from the soil only through long, severe labor and discouragement. Every bushel of wheat garnered represented many days of toilsome work in the hot, sweltering sun. The implements for work were crude, and were very inefficient in every respect. The soil grudgingly yielded full crops, and the general feeling prevailed that broad acres were required to support one family. Nearly all were compelled by force of circumstances to be farmers, for one could scarcely raise more than enough for his needs and those of his family. In such a condition of affairs there was little room for those who would follow the more congenial occupation of the counting house, store and similar business. The growth of cities was slow, while rural population spread out over large tracts of land to prevent crowding.

But with the advent of farm machinery and implements the soil was made to produce larger crops at less expense, and with a smaller expenditure of physical force. Half of the land already under cultivation was made to produce nearly as much as the whole amount did before, and inventions and improvements have continued along this line until nearly all of the farm work can be performed by machinery.

The earliest inventions of farm implements were the crude plows, rakes, shovels and forks which are presented to us occasionally in old prints. The first farm implement store that was ever established in this country kept these articles in stock, and many of them were made of wood instead of iron or steel. When the iron plowshare was first introduced many farmers objected to its use because they thought it made the weeds grow faster; but they did not realize that anything which made the weeds grow also started the cultivated plants into better development.

Mowing machines were among the earliest farm implements invented in this country, and farmers did not take kindly to them for a great many years. In 1823 a mowing machine to be run by horse power was mentioned; but the machine never came into use until over ten years afterward. At about the same time Yankee ingenuity invented the first wooden tooth horse rake, and this was better received by the farmers than the mowing machine. The first mowing machine was a crude affair, and it passed through many periods of evolution before it came into general use. Its machinery is more complicated than most farm implements, especially when reapers and binders are attached, and nearly every year some improvement has been introduced upon it since its first plan was adopted over seventy years ago. The

cost of this machine was also a detriment to its general popularity, and for many years it simply figured in the history of agriculture as a fine thing for exhibit at fairs and institutes.

Finally, however, in 1830-'38, the farmers so far approved of them that they experimented with the new idea, and while a great deal of fault was found, their merits were so far recognized that many adopted them permanently for cutting hay crops. Up to 1832 they continued to be exhibited annually at every fair, and many new patterns were placed on trial. They were all crude looking affairs, and very much unlike our modern machines, which have entirely superseded them. There is as much difference in their appearance as there is between the old "John Bull" locomotive sent to the World's Fair and the ideal steam engine of to-day. Some time in the fifties the idea was suggested that a reaper could be attached to the mowing machine and thus greatly facilitate the work of gathering the crops. It was really in 1855 that mowing machines were first put upon the market for general sale, and then they were used only by wealthy and extravagant farmers, the majority preferring the old hand method of cutting hay and grain.

When the war broke out farm labor became very scarce, and wages were so high that farmers had to resort to everything to get through with as much work as possible without hiring help. Then it was that many bought machines, by means of which they could do as much work in one day as several men. Before the war closed mowing machines were in pretty general use, and their reputation was forever established. Other farm machinery that would facilitate work was eagerly sought for, and inventors, probably encouraged by this demand, quickly seized the opportunity to make money. During the war and shortly afterward farm implements were rapidly invented and manufactured, and when the farmer soldiers returned to their former homes they found that machines had taken the place of hired men to a large extent. Lawn mowers had been introduced, and one man could do the work of two or three on a gentleman's estate in keeping the grass cropped short. Horse rakes were in constant use for gathering up the hay that the machines had cut, and grain drills dropped the seed in the ground as fast as a man or horse could walk. The plows had been improved so that deep furrows could be turned over, and reapers had been attached to the mowing machines for bunching the straw.

The change had been hastened by the war and by the sudden demand for some quicker and easier method of performing farm work. When the farmer-soldiers returned to their fields they had to adapt themselves to the new conditions. They soon found that machinery was revolutionizing their old industry, and that while things were made cheaper the amount to be gathered from each acre of soil was much greater than before. The old theory, that the population would some day get so dense as to make it necessary to starve off many that the others might secure enough from Mother Nature on which to live, seemed to be "knocked in the head." The soil was found to be almost unlimited in its capacity for production. It needed simply the hands of science and machinery to make it grow with the population.

Since then invention has continued to develop rapidly, until now every farm is supplied with many new implements and machinery that reduce the amount of farm labor. The number of implements for this work are too numerous to mention. Nearly every season there is something new, and many of the best inventive minds have turned their attention towards this field. Potato planters and potato diggers are doing away with the old back breaking work of potato cultivation. The sulky plows are making this work an enjoyment rather than a hard labor for some farmers, while on the enormous farms of the west the steam plows are ripping up the earth like Titans as one man guides it easily across the

prairie lands. Cultivators and horse hoes are keeping down the weeds from the fields, and robbing the farmer of his worst toil. On the regular market farms, where quantities of manure are used, the manure spreaders are being introduced to lessen and facilitate the work. The large hay farms are provided with their hay loaders, which do away with the labor of pitching up the hay by forksful.

In the smaller tools the inventions have kept pace with those made on a larger scale. Improved shovels, forks, spades, hoes, scythes and rakes are crowding out the old patterns, and each successful one enjoys the distinction of being better adapted to the work of saving labor. Many new small implements never before heard of are being put upon the market. Tree pruners are now constructed upon trucks so that they can be moved rapidly from tree to tree and the labor of pruning one hundred acres of trees is reduced to a minimum. The gardener has a large collection and variety of tools to select from, and there is something devised for everything he wishes to do.

The dairy business has its new inventions as well as the general farm. The old-fashioned dash churns have been largely relegated to the past, while steam, horse or water power churns have been invented to separate the butter from the cream on a large scale. Moulding and printing machines are shaping the butter into fancy forms for display on the markets; and patented separators are producing fancy grades of butter never before known. In a thousand different ways machinery is revolutionizing the agriculture of our country; and the trade in these implements forms alone an industry of gigantic importance.—George Ethelbert Walsh in New York Independent.

## Dive Into It.

The German strong man Sandow has given some marvellous performances during the summer. He would take two chains, whose mates have sustained a weight of seven or eight thousand pounds, and fasten them snugly around his great nineteen-inch biceps. The arm is doubled, the big muscle swells, and the chains that two strong horses cannot break, snap as if they were cotton threads. In his exhibition before Dr. Sargent, of Harvard, Sandow placed his hand under the foot of a man who weighed two hundred and fifteen pounds, and, with his arm held straight, placed that burden on a table as easily as an ordinary man would lift an orange. He declares that the only secret of his strength is training; that such muscular power as he possesses is possible to a man who is willing to work intelligently and keep at it long enough. Whether this is absolutely true or not, it is certain that many go through life pitifully weak compared with what they might be, and Sandow's words are full of suggestion for more than the physical side of life.

No matter how irksome the task, bring all your powers to bear upon it; dive into the very heart of it; probe it to the quick; anatomize it; exhaust it. If confronted by a difficulty, no matter how serious, do not flinch from it, or turn aside, but face it boldly and resolutely; survey it coolly on all sides; then close and grapple with it, till by your prowess you have crushed it to powder. Do you want to grow strong? Then you must measure yourself, not with pygmies, but with giants, and wrestle with all your might. A throw upon your back will do you good. Your pulse should beat high, as if you were in battle, and the sound of the trumpet in your ear.—Exchange.

A London cable says the Quebec loan was a complete success. The invitations for subscribers were issued on March 8, for the taking up on \$200,000 four per cent bonds of the province of Quebec at 97½, the proceeds of which are to be used in paying the matured and maturing liabilities of the province. The loan has been considerably over-subscribed.