April, '12

leads one to consider what should be its form." Later he specified the shape of the plow by stating:



Fig. 11.-Top view showing frame con struction of P. & O. plow.

"The offices of the moldboard were to receive the sod after the share has cut it, to raise it gradually, and to reverse it. The fore end of it should be as wide as the furrow, and a length suited to the construction of the plow."

Daniel Webster is another prominent American who, history relates, was interested in the development of the plow. He designed a very large and cumbersome plow for use upon his farm at Marshfield, Massachusetts. It was over 12 ft. long, turned a furrow of 18 inches wide and 12 inches or more deep, and required several men and yoke of oxen to operate it.

Charles Newbold, of Burlington, New Jersey, secured the first letters patent on a plow in 1797. Newbold's plow differed from others in that it was made almost entirely of iron. It is stated that



Fig. 12.—Frame of six furrow Mogul Gang Plow.

the farmers of the time rejected the plow upon the theory that so much iron drawn through the soil poisoned it, and not only retarded the growth of plants, but stimulated the growth of weeds.

Jethro Wood gave the American plow its proper shape. The moldboard was given such a curvature as to turn the furrow evenly and distribute the wear well. Although Wood's plow was a model for others which followed, he was unrewarded for his work, and finally died in want.

The Canadian Thresherman and Farmer

As farming moved farther west the early settlers found a new problem in the tough sods of the prairie. A special plow with a very long, sloping moldboard was found to be necessary in order to reduce friction and to turn the sod over smoothly. Owing to the firmness of the sod, it was found that curved rods might be substituted for the moldboard. Later, when the sod became reduced, it was found that the wooden and cast-iron plows used in the easmitted the steel to be hardened without warping. It is very strong on account of the iron center, which will not become brittle.

In 1837 John Deere, at Grand Detour, Illinois, built a steel plow from an old saw which was much similar to Lane's first plow. In 1847 Deere moved to Moline, Illinois, and established a factory which still bears his name. William Parlin established a factory about the same time at Canton,

415

Fig. 13-Side view of P. & O ten bottomengine gang.

tern portion of the country would not scour well. This difficulty led to the use of steel in the making of plows. Steel, having the property of taking an excellent polish, permitted the sticky soils to pass over a moldboard made of it where the other materials failed.

In about 1833, John Lane made a plow from steel cut from an old saw. Three strips of steel were used for the moldboard and one



Fig. 14.—Detail of individual plow with raising lever, etc.

for the share, all of which were fastened to a "shin" or frame of iron. John Lane secured in 1863 patent on soft-center steel, which is used almost universally at the present time in the making of tillage tools. It was found that plates made of steel were brittle and warped badly during tempering. Welding a plate of soft iron to a plate of steel was tried, and, although the iron supported the steel well when hardened, it warped very badly. The soft-center steel, which was formed by welding a heavy bar of iron between two bars of steel and rolling all down into plates, per-



Fig. 15.-Method of fastening plow standard to beam.



Fig. 16.—Casting to connect frame and beam, with anchor bolt to admit bottoms for parallelism.

which is also one of the largest in the country.

The development of the sulky or wheel plow has taken place only recently. F. S. Davenport invented the first successful sulky



Fig. 17.—Beam coupling showing set screws to regulate "wing" of share.

plow, i.e., one permitting the operator to ride, February 9, 1864. A rolling coulter and a three-horse evener were added to this by Robert Newton, of Jerseyville, Illinois. But E. Goldswait had patented a fore carriage in 1851 and M. Furley a sulky plow with one base December 9, 1856. Much credit for the early

Page 11

development of the sulky plow is due to Gilpin Moore, receiving a patent January 19, 1875, and W. L. Cassady, to whom a patent was granted May 2, 1876. Cassady first used a wheel for a landside.

Canadian development in plows has been more recent, although plows have been made in this coutry for a number of years. The Scotch and English plows served largely as models until recently when the American patterns is so far as moldboard and beam construction are concerned have been closely followed and in some cases improved upon.

So much for the plow itself. It concerns us vitally, as a grain raising country, because without the modern plow in all its forms, we would be nothing but a primitive race struggling for bread. The raising of grain on a commercial basis would be an impossibility.

The Engine Gang

About eight years ago the West was awakened to the fact that a new factor had been introduced into soil cultivation. Here and there throughout the West were to be found steam engines pulling plows and in a small way tearing up the broad prairies. It was largely the farmer's own idea. He had no special equipment. His engine was not designed for traction work, and his plows were such as his horses had pulled. They were two and three bottom sulkeys, fastened together with chains, rods or cables, and as their weight was not adapted to the heavy soils of the Western prairies, it was largely a matter of cut and cover, and the work itself was inferior both in quantity and quality. To quote from a letter written by a Western Canadian farmer in 1905.

I have been running a steam plowing outfit for a little less than a year, and have so far plowed only sod or breaking, as we call it. At present our crew consists of eight men, engineer and man



Fig. 18.-Section of frame of Oliver engine gang plow.