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IN ADVANCE.

Improved Gang Plow.

When the great Western prairies were opened by agriculturists, the necessity for the employment of some speedy and certain method for tilling the soil was apparent, and accordingly gang plows and cultivators were introduced and used with great advantage.

The accompanying engraving represents a new improvement in this class of machines, which consists

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REPORT OF THE COMMITTEE ON HEAVY ORDNANCE.

Under the head of "heavy ordnance" your committee would call attention to three classes of guns: First, those made entirely of cast iron; second, those made of cast iron and banded with wrought iron;

reversed, rendering the gun less liable to burst from the explosion of the powder in it; and a much greater degree of hardness is given to the interior surface, rendering the gun less liable to abrasion in the bore by the passage of the projectile along it, and the action of the gasses of the powder upon the metal. It is generally held by the witnesses that no effective gun of large calibre can be made of cast-iron except upon the Rodman principle.



BLACK'S GANG PLOW.

n a method for raising and lowering the plow so as to increase or diminish the depth of the furrow at will. This is done as follows:—The plows are set in the beam, A, to which they are securely fastened and braced. The rod, B, serves to regulate the position of the plow share or its relation with the beam, and the nuts on this rod are to raise or lower the point as desired, so as to cause it to work to advantage. The depth of the furrow is regulated by the lever, C. One side of the frame is fastened to an upright arm, D; this arm carries the near wheel, E, and the axle of the wheels is at one end formed into a jaw, F, which embraces this upright arm, and slides up and down on it, when the lever, C, is worked. This throws the plows in or out, so as to diminish or increase the depth of the furrow. The plows can be raised entirely clear if desired, when proceeding to or from the field, and the width of the furrow can also be regulated by a screw, G, which changes the line of draught from the pole, thereby causing the plows to take a wider or narrower slice.

A patent has been applied for this improvement through the Scientific American Patent Agency by

and third, those made entirely of wrought iron. Of the first class are the guns generally known as the Dahlgren gun and the Rodman gun. Of the second class is the Parrott gun. Of the third class is the Ames gun. There is still another gun, known as the Ward steel gun, but as it does not come, so far as your committee have been able to learn, under the head of "heavy ordnance," they have not deemed it necessary to devote much attention to it.

THE RODMAN GUN.

The Rodman gun, while having to some extent its peculiarity of form, is principally distinguished by the mode adopted in its manufacture, which is an invention of Major T. J. Rodman. The casting is made around a hollow core, or core-barrel, as it is termed, into which is introduced a stream of cold water, the outside of the casting being kept heated until the cooling from the interior reaches the outer portion of the mass of metal forming the casting. This mode of manufacture, it is claimed, ensures two important advantages over the old method of casting the gun solid and then boring it out. The strain upon the metal produced by cooling in large masses is

THE DAHLGREN GUN.

The Dahlgren gun is the invention of Rear-Admiral John A. Dahlgren, and is distinguished by its exterior form. The plan adopted to avoid the strain consequent upon cooling a solid casting of large size from the outside is to make the castings considerably larger than would otherwise be needed to produce a gun of the required size, anneal it after cooling, and then turn it down to the proper size and form. But the Dahlgren guns of the largest calibre are now being manufactured upon the Rodman principle.

These two guns are the only guns of large calibre, made entirely of cast-iron, which are now used in the service. It will be seen from the testimony that officers of the navy generally prefer the Dahlgren gun for naval service, while officers of the army express a preference for the Rodman gun. Both of these guns would appear, from the testimony, to be the best cast-iron guns now known to any service. They are generally smooth-bore guns, but few, if any, of the larger calibre being rifled.

THE PARROTT GUN.

The rifled gun of large calibre, employed almost