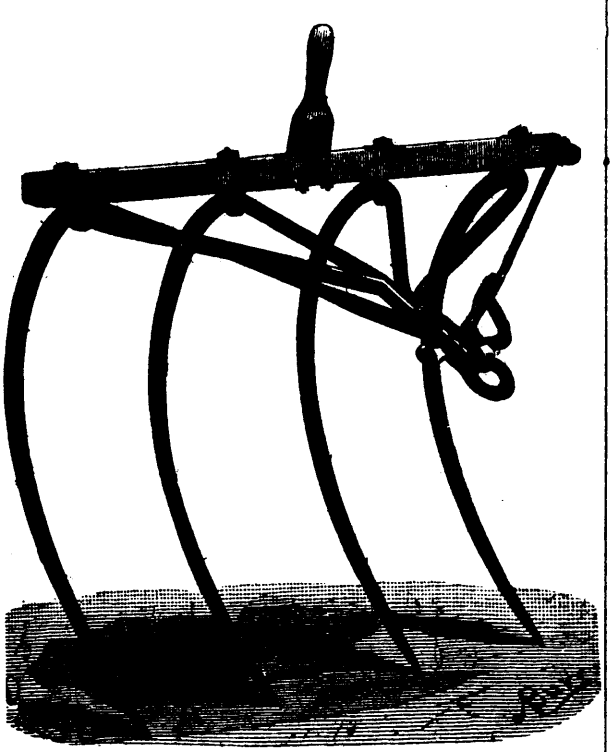
Agricultural Implements.

HARRISON'S HAY FORK.

We illustrate herewith a horse hay fork, patented in the United States. The fork is intended to lift large masses of hay or straw for the use of the threshing machine, or stacking or loading.

The tines are bent so as to grasp the load to the best advantage. These tines pass through the eyes upon the cross-bar, which keep them well apart and steady them. Above the cross-bar the tines are continued and brought together and strongly secured at one point as shown. Strong eyes are secured to the outer ends of the bar and a triangular frame is formed of two other bars or arms, which are secured to these eyes at the ends of the bar so as to allow the fork to swing, and these arms meet in the middle above the head of the tines, forming a strong eye from which the whole is suspended.

It will be manifest that when suspended, the weight of the fork tines will cause the head to swing forward and allow any load to be discharged, unless it is confined in some manner. In order to do this, a hook is formed at the end of the fork, so that this hook just swings clear between the sides of the arms where they are bent to form the eye. A latch is pivoted to one of the arms and extended across the back of the other arm, so that when it is pressed upward into the hook, it will prevent the fork from swinging forward, and as the latch rests across the small space between the arms, it will be seen that it will have great strength to resist the strain upon the fork.



HARRISON'S IMPROVED HAY FORK.

Another great advantage claimed for this latch, is that it lies flat across the back of the fork, and does not project so as to catch or interfere with anything, if it is desired to hoist alongside of a mast or vertical post. In order to keep this latch up and make it catch on the hook, a spring is employed—secured to one of the arms—and this keeps the latch in position. A guiding staple on the opposite arm holds the latch in place and limits the motion.

When it is desired to discharge the load, all that will be necessary is to pull the cord attached to an eye in the outer end of the latch. By this construction, the fork is made very strong, the tines being formed on a single piece each, with a liability to split, and it is very simple and cheap. The latching device is very strong, and by its position across the space in which the head swings, it is capable of resisting a heavy load, and at the same time is entirely out of the way.

Mechanics.

HOW TO MAKE AN EMERY WHEEL.

Joshua Rose writing for the supplement of the *Scientific American* gives the manner of putting the emery and fastening it upon the wheel as follows: The face of the wheel is well supplied with hot glue of the best quality, and some roll the wheel in the emery. The emery does not adhere so well to the leather as it does when the operation is performed as follows: Let the wheel either remain in its place upon the shaft, or else rest it upon a round mandril, so that the wheel can revolve upon the same. Then apply the hot glue to about a foot of the circumference of the wheel, and cover it as quickly as possible with the emery. Then take a piece of board about three-fourths of an inch thick and 28 inches long, the width being somewhat greater than that of the polishing wheel, and placing the flat face of the board upon the circumferential surface of the wheel, work it by hand, and under as much pressure as possible, back and forth, so that each end will alternately approach the circumference of the wheel. By adopting this method the whole pressure placed upon the board is brought to bear upon a small area of the emery and leather, and the two hold much more firmly together. The speed at which such wheels are used is about 7,000 feet per minute. The finest of emery applied upon such wheels is used for cast-iron, wrought iron and steel, to give to the work a good ordinary machine finish; but if a high polish or glaze is required, the wheels are coated with flour emery, and the wheel is made into a glaze wheel by wearing the emery down until it gets glazed, applying occasionally a little grease to the surface of the wheel. Another kind of glaze wheel is made by covering the wooden wheel with a band of lead instead of a band of leather, and then apply to the lead surface a mixture of rouge, crocus and wax, worn smooth by applying to it a piece of flint-stone before applying the work. Others add to this composition a little Vienna lime. For flat surfaces, or those requiring to have the corners or edges kept sharp, it is imperative that such wheels as above described—that is to say, those having an unyielding surface—be used; but where such a consideration does not exist, brush and rag wheels may be used. In Europe comparatively large flat surfaces requiring a high polish are finished upon wooden wheels made of soft wood and unemeried, the polishing material employed being Vienna lime. The lime for ordinary use is mixed with water, and is applied by an assistant on the opposite side of the wheel to the operator. For superfine surfaces the Vienna lime is mixed with alcohol, which increases its efficiency; and here it may be as well to note that Vienna lime rapidly deteriorates from exposure to the air, so that it should be kept as little exposed as possible.

We learn from the *Deutsche Allg. Fol. Zeit.* that experiments recently made at the Ilseder Iron Works, near Peine, with Herr Albert's patented apparatus for introduction of solid substances with the blast into blast furnaces, have given very favourable results, and the proprietors have ordered the apparatus for two of their blast furnaces. For a test fine coke was used, and about 150 kg. of this, it was found, could be blown per hour in a regular stream into the furnace. This must evidently have a great influence in raising the temperature on the hearth, and with several apparatuses the effect might be considerably intensified.

Malleable Brass.— A German periodical is responsible for the following method of making malleable brass: Thirty-three parts of copper and twenty-five of zinc are alloyed, the copper being first put into the crucible, which is loosely covered. As soon as the copper is melted, zinc, purified by sulphur, is added. The alloy is then cast into moulding sand in the shape of bars, which, when still hot, will be found to be malleable and capable of being brought into any shape without showing cracks.

Cement for Leather.—Of many substances lately brought very conspicuously to notice for fastening pieces of leather together, and in mending harness, joining machinery belting, and making shoes, one of the best is made by mixing ten parts of sulphide of carbon with one of oil of turpentine, and then adding enough gutta-percha to make a tough, thickly flowing liquid. One essential perquisite to a thorough union of the parts consists in freedom of the surfaces to be joined from grease. This may be accomplished by laying a cloth upon them and applying a hot iron for a time. The cement is then applied to both pieces, the surfaces brought in contact, and pressure applied until the joint is dry.