

## New Inventions.

## Improvement in Manufacturing Cast Steel.

The following is the description of a method of making cast steel, for which a patent has been recently granted to G. Brown, of Swinton, England, and described in the last (October) number of *Newton's London Magazine* :—

"The patentee puts into a common melting pot charcoal bar-iron, clipped in pieces, of about one and a half inches long, and adds thereto good charcoal pig-iron, in the proportion of one part, more or less, by weight of pig-iron, to three parts, more or less, of the clipped bar-iron. This combination of metals is melted in the usual manner, and then run into ingot molds. By this process cast-steel is obtained, suitable for any purpose to which cast steel, made on the old plan, can be applied,—the various qualities of steel required being obtained by slightly varying the proportions of the bar and pig iron. Taking 40 pounds weight as the standard of an ingot, from seven to twelve pounds of pig metal are used, and the remainder is made of bar-iron; these proportions would produce a cast-steel suitable for most purposes. Thus, for cast steel to be manufactured into edge tools, ten pounds of pig metal are added to thirty pounds of bar iron. For table knives, eight pounds of pig metal are combined with thirty-two pounds of bar-iron; and for hard steel, twelve pounds of pig metal are added to twenty-eight pounds of bar iron. But as almost all irons differ in hardness and quality, these proportions must, to a slight degree, be modified according to the judgment of the melter."

The nature of this improvement consists in smelting charcoal bar and charcoal pig iron together. If the mixture of these two kinds of iron can produce good cast-steel, the invention is a good one on account of its great simplicity.

## Supports in Coal Mines.

A correspondent from Wheeling, writing to the Cincinnati, Ohio, *Inquirer*, states that the coal mines near Wheeling are now very valuable. In describing the process of mining, he says:—"The rock over-head is supported by beams resting upon posts—a very necessary precaution, for it sometimes gives way. As the workmen spread their excavations, on every side through the strata, they put up supports for the roof."

This is the old-fashioned method of mining coal, but it is not a good one. Wooden posts put in to support the roof are liable to decay, and thus cause accidents by the falling down of the roof, the best plan of supporting which is to leave posts or pillars of the coal standing; this is the improved method of coal mining.

## Effects of Nicotine.

The *New Hampshire Journal of Medicine* thus describes the effect of tobacco juice on snakes :—

"A black snake about six feet in length, which had been captured, was grasped by one hand around the neck and some tobacco juice thrown into its mouth. After writhing spasmodically a few moments the snake became rigid, and after its death actually retained the position in which it was held, its head elevated from the ground and his body curled around beneath. The experiment has been tried successfully on several smaller snakes, and other reptiles, in preparing them for cabinet preservation."

## Self-Acting Carriage Gate.

Our engraving illustrates the invention of J. A. Ayers, for which letters patent were granted January 22d, 1856.

The gate is made in the common manner. It is opened by the weight of the vehicle, whose wheels, in approaching the gate in the direction of the arrow, strike the hinged plates, A, and depress them. Plates, A, are connected, by means of rods and cranks, B C, with a crank at D, which is attached to the lower extremity of the inner end of both gates. By the depressing plates, A, the gates are caused to swing open, and fasten on the catches, E. The gates are so hung that they

will close by their own gravity when the catches, E, are unfastened. This unfastening is done by depressing the rails, F. The catches, E, are connected by means of rods, G H, and cranks, I, with rails, F. When the carriage has passed through the gates its wheels strike one of the rails, F, and unfasten the catches, E, whereupon the gates, being liberated, close. G' are springs, which raise the front end of catches, E, after they have been

## SELF-ACTING CARRIAGE GATE.

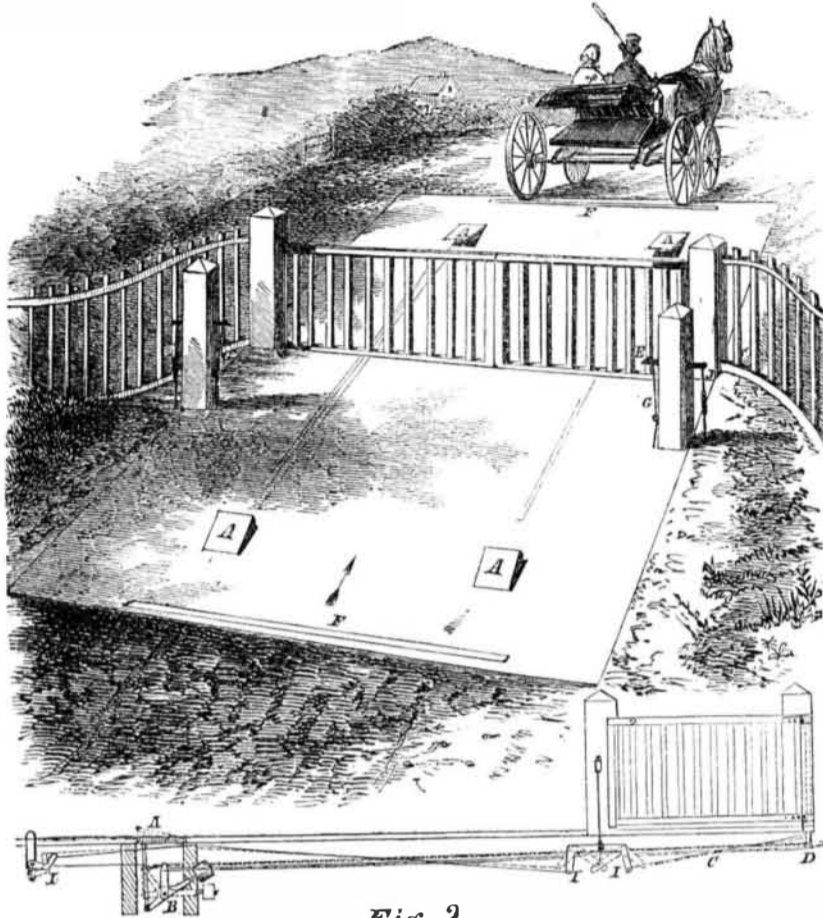
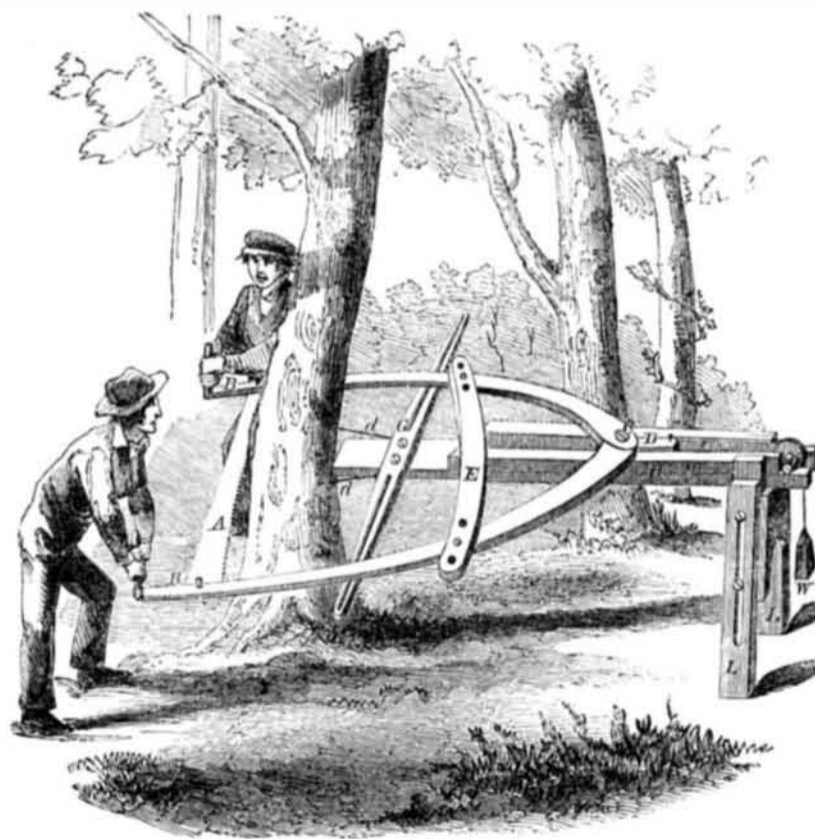


Fig. 2

depressed. Cranks, B, are weighted so as to throw up plates, A, after they have been depressed.

The above is a very cheap, simple, and effective improvement. It has been introduced, we understand, in several localities, with much success. There is nothing about it liable to get out of order. Its convenience and advantages are obvious. Address the inventor at Hartford, Conn., for further information.

## MATHER'S TREE SAW.



## New Tree Cutter.

This figure represents the machine, and its application to the sawing of trees, for which a patent was granted to E. Mathers, of Morgantown, Monongalia Co., Va., on the 18th of March last.

This machine consists of the saw with its frame, and a trestle with its appendages. A is the saw, which is of a concave form. B B are its curved arms, secured at the apex by C, a pivot bolt. E is an adjustable cross bar. The saw can thus be easily adjusted to any desired tension. These parts constitute

the saw frame. The fulcrum pin, C, passes through the guide block, D, which slides in a channel in the trestle, and has a weight, W, secured to it by a cord passing over a pulley. This weight, by its tension on the fulcrum block, D, feeds the saw forward to its work as it cuts into the tree. L L are the legs of the trestle. They have vertical slots in them for securing the saddle, F, by bolts, at different heights. H is the trestle reach or bearer; it rests on the saddle, F, therefore it is raised and depressed with the adjustable saddle. The each extends to the tree to be cut down, and

on its front end is one or more dogs, which are driven into the tree to hold it firm; there are also two long side dogs, d d, for the same purpose. The cross bearer, G, is a support and guide to the arms of the saw as they are reciprocated back and forth.

The concave saw is the best for cutting down trees, but a convex one may be employed by inserting a wedge after the saw has entered the cut some distance. This sawing machine can also be applied to saw logs after the trees are felled. This is accomplished by removing the legs of the trestle, raising the bearer, H, vertically, making the long dogs, d d, the hypotenuse of a triangle, by forcing them into the log and holding it firm. The saw frame can then be worked vertically to cut the felled log, as well as horizontally to cut down the tree.

This sawing machine is very simple, is designed for hand work, and can be constructed by any carpenter, and by most of our farmers. It can be taken to pieces in a few minutes, carried conveniently from place to place, and also put up in a few minutes. A machine to be useful for sawing in the forest must be cheap, simple, light, and easily adjusted—objects which this machine accomplishes; also the employment of manual labor to good advantage in sawing. For more information address the inventor at Morgantown, Va., as above.

## New Size for Cotton Warps.

The Liverpool (Eng.) *Mercury* states that John Leigh, surgeon, of Manchester, has proposed as a substitute for flour paste to dress cotton warps, the silicate of soda. It also states that several manufacturers have been engaged in the experiments necessary to test its efficiency, and 400 to 500 pieces of cloth have been made with this description of size. The cloth in which it has been used is quite equal in color and softness to the other, while experiments have shown that it does not interfere with the strength of the fabric, or produce any deteriorating chemical effects. It is calculated that a saving of 25 to 50 per cent. will be effected by the adoption of this instead of flour size, whilst the quantity of flour which will be set at liberty for the purposes of food would supply the people engaged in the cotton manufacture with bread.

## Machinists' Rules and Squares.

We would direct the attention of machinists, carpenters, and all mechanics interested in having accurate measures and squares, to the advertisement of Messrs. Darling & Schwartz, of Bangor, Me., in another column. We have examined their steel try squares, rules, &c., and can give them a good recommendation for accuracy and excellent finish.

## Trees on Railroads.

The *Railroad Record* states that the Illinois Central R.R. Co. have adopted the expedient of planting locust trees on each side of the road. The object of this policy is to provide timber for a future supply of ties. The managers of this railroad have exhibited a wise and sagacious course of action. All our railroads should do so likewise.

## Explosion of a Steam Fire Engine.

The *Miles Greenwood* was taken out by the company for drill on Wednesday, when she again proved a failure. Before the water went through the hose, the top of the pump blew off with much violence, and rendered the engine utterly incapable of further action. Several persons narrowly escaped injury by the explosion, and some were rudely jostled and trampled upon by the haste of the crowd in attendance to make their exit from all chance of danger.—*Boston Transcript*.

## Ship Ventilation.

To ventilate a ship properly, is to make a passage at the base of the hold for the free distribution of pure air, and to allow the noxious vapor to escape out of the hatches. The philosophy of this may be seen by holding a lighted candle at the top of the door of a close room without fire, when the flame will be blown outward toward the hall; if the candle be held at the bottom of the door, the flame will be drawn inward.—*U. S. Nautical Magazine*.