

**IMPROVED CULTIVATOR.**

Our engraving illustrates a new form of cultivator, which is constructed so as to cultivate or loosen the earth between two rows of growing crops of corn, tobacco, sugar cane, cotton, or other products. The special improvement in the machine consists in the arrangement, in connection with a single shovel plow, of a series of hoes arranged in rear of the former and adjustably secured to the plow.

The standard, Fig. 1, projects above as well as below the beam, and carries on its lower end the shovel, A, upon the back of which, and at either side, are pivoted wings, B. These are secured by bolts and nuts, as shown, and may be adjusted so as to operate to the best advantage under varying conditions of soil. In rear of the shovel are four hoes, arranged in pairs, C C and D D, and connected by the tie rods, E, to the beam. The rods to which these hoes are attached extend upwards, and are hung upon a horizontal bar, F, which passes through the handles of the standard. This rod is preferably screw threaded, and provided with the requisite number of nuts to hold the different parts in their proper relative positions. The pair of hoes, C C, are held apart by a bar, G, and the other hoes, D D, are similarly separated by a like device. These bars are clamped to the hoes by bolts and nuts, and are at those points provided either with a series of notches or with longitudinal slots so that the blades may be spread apart as circumstances may require. The hoes are turned up on one side so that by changing them from one side of the plow to the other, they may be made to throw the earth up to or away from the row of growing plants.

When it is desirable to use the single shovel plow without the hoes, the latter are disconnected from the tie rods, D, which, together with the hoes, D D, are tied up or hung upon the handles, as in Fig. 2, while the hoes, C C, are swung over and carried on top of the beam. Either pair of hoes may be thus disconnected while the other pair remain in operating position.

Patented December 10, 1872. For further particulars address the inventors, Messrs. C. and P. G. Krogh, Kroghville, Jefferson county, Wis.

**AN IMPROVED HORSE COLLAR BRACE.**

The weakest part of the ordinary horse collar is at the under side or throat, as it is at this point that the strain is principally applied. As a result, and especially in light collars, the article becomes worn out or breaks in this locality much sooner than in other portions. To obviate this difficul-



ty, Dr. Edward Batwell, of Ypsilanti, Michigan, has recently patented, April 15, 1873, a metal plate which extends up some distance, and thus prevents the collar from closing on the horse's shoulder. The form of the device, which may be made of any suitable metal, together with its mode of application are readily understood from the annexed illustrations.

Dr. Batwell states that the invention has been fully tested, in preventing pressure and in retaining the collar in good shape, for the past two years, and that by its use he has been enabled to employ collars otherwise entirely worthless, from being broken or worn out at the throat. For further particulars regarding sale, rights, etc., address the inventor as above.

**John Stray.**

John Stray is employed as an engineer in a factory at Jersey City, N. J. He is a short, thick set man of fifty years or so, with a frosted beard, and does not look as if anything very serious had ever happened to him. But he is the hero of a patriotic exploit that will live in the memories of his fellow citizens. John Stray was a private in the First New York Volunteer Engineers, at Morris Island, Charleston, S. C., during the siege of 1863. An important gun—a 200 Parrott—had been spiked by the enemy, who were then enabled to occupy rifle pits very near the gun, and prevent its use by shooting down whoever ventured to attempt the removal of the spike. Stray was known to be a good mechanic, and at last yielded to the request of the commanding general to undertake the desperate job. He straddled the

position, so that the heel will wear square and the foot be thrown flat upon the ground. The use of india rubber or other elastic material prevents slipping on the ice, and adds to the gracefulness of the step, while carpets are not injured by projecting nails or sharp angles. Patented September 17, 1872.

**Progress of Astronomy in the United States.**

Mr. Richard A. Proctor, the distinguished British astronomer, bears the following testimony to the progress and results of astronomical science in this country:

"The American arrangements for extending government aid to astronomy seem to me to afford a model which might be copied with advantage on this side of the Atlantic. We see their physical observatories attached to other govern-

ment establishments, to universities, and so on. Their professors of astronomy are not only real working astronomers, but skillful mathematicians (for the most part university men) and men of admirable zeal in the cause of science. I have been struck with the abundance, I had almost said the superabundance, of labor which has been bestowed on work the record of which has recently reached me from America. Thus, in the mathematical investigations of the coming transits of Venus, a problem of difficulty has but to be suggested, to be at once attacked and solved to the utmost limits of exactness. The pictures of solar phenomena, spots, faculae, and prominences, are the most striking and beautiful I have yet seen. Their lunar pic-

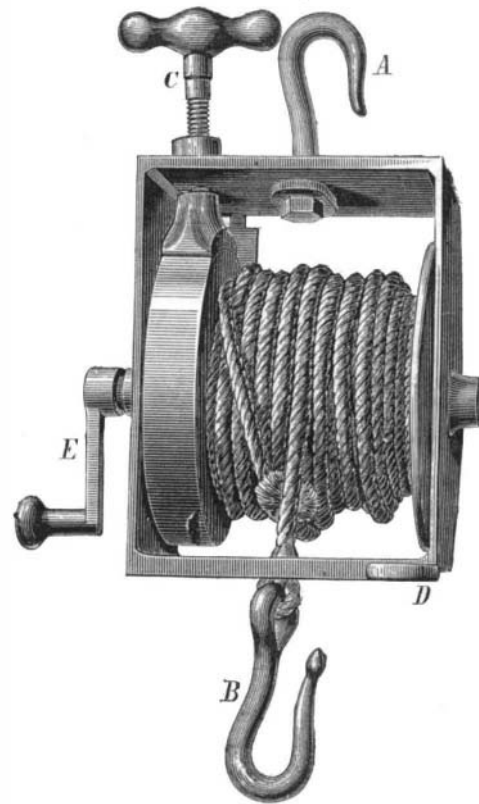
tures are remarkable for artistic beauty, as well as scientific value, and, altogether, their work, as I have said, is a model for our astronomers."

**A NEW FIRE ESCAPE.**

Our engraving represents a new portable fire escape, by means of which, it is claimed, a person can lower himself with ease and safety from the windows of a burning building, or, if necessary, may be let down by some one within the edifice.

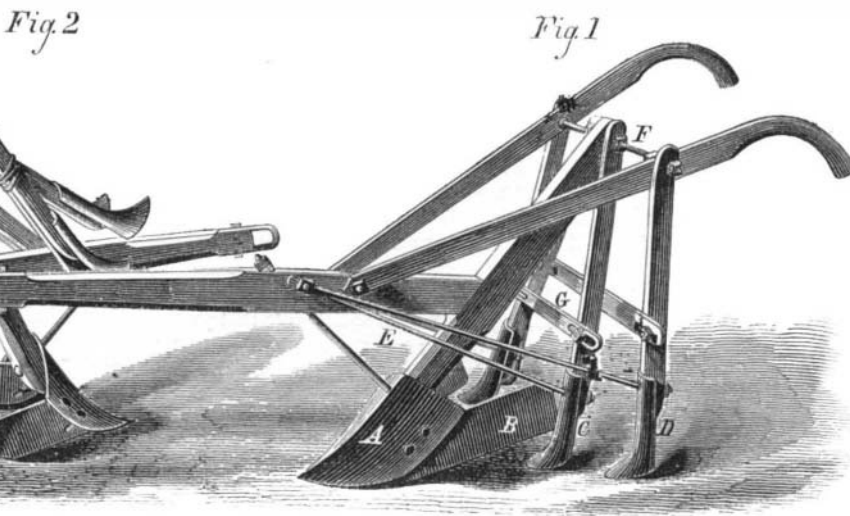
The apparatus is attached by the hook, A, to a suitable clamp, not shown, which is readily fastened to the window sill or casing. To the lower hook, B, is hung a sling seat in which the descending person is supported. Thus arranged, the device is operated by the individual within the building, who, by means of the screw, C, which presses a chock against the revolving disk attached to the barrel on which the rope is wound, governs the descent, causing the same to be fast or slow at will.

In case of a person lowering himself, the machine is inverted and suspended by the hook, B, to the clamp, the



sling being hung to the other hook. The operator then grasps the handle, D, with the left hand, and the screw, C, with the righthand, and thus regulates his downward movement. By tightening the screw, a slow descent may be effected by means of the crank, E. The invention is stated to be cheap, efficient, and not liable to get out of order. For further particulars regarding agencies, sale, etc., address the patentees, Messrs. Merritt & Sweetser, P. O. Box 2,643, North Bridgewater, Mass.

**PHENANTRENE.**—This name has been given to a new hydrocarbon obtained from crude anthracene. It contains carbon and hydrogen in the same proportions as the material from which it is derived.

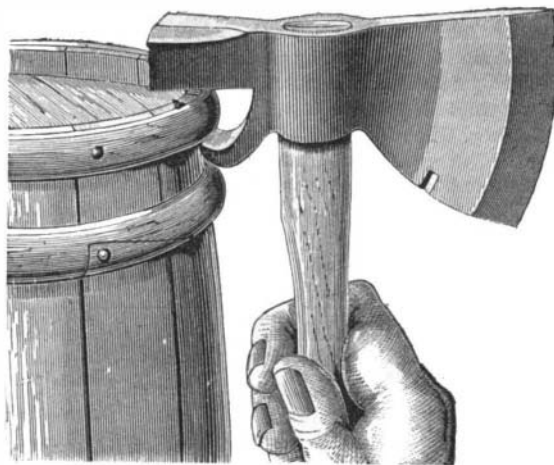


**KROGH'S FARM CULTIVATOR.**

gun, and for fifteen minutes drilled away amid a shower of bullets, then hitched on the primer and lanyards and dropped to the ground. The enemy thought they had hit him and sent up an exulting howl, but the flash and roar of the great gun and the showering of grape through their ranks soon showed them their mistake. Those who could do so ran for their lives, but many were killed. It was found that twenty-two bullets had struck the gun while John Stray was working his drill.

**NOVEL CLAW HATCHET.**

The object of this handy little device is so clearly indicated in our illustration that little description is required. It con-



sists, simply, in a claw, made upon the hammer end of an ordinary hatchet, which serves to grasp the top hoop of a barrel. By the aid of the handle as a lever and the hatchet head as a fulcrum, the hoop can be quickly removed uninjured, thus allowing the head of the barrel to be easily taken out. Patented Nov. 12, 1872, by Mr. D. E. Weaver, of Cheviot, Ohio.

**NEW HEEL PLATE FOR BOOTS AND SHOES.**

Mr. Gideon B. Massey, of New York city, is the inventor of this device, the object of which is to prevent the unequal wearing out of boot heels and their consequent unsightly twisting over to one side. A disk of rubber is arranged of



a diameter to fit within a flange on a metal plate and to project below the same, forming a wearing surface of the heel. This is attached by a fastening screw and a conical metal washer formed to fit the under side of the screw head. The latter is forced into the disk, which it pushes into the dovetail flange by which it is securely held. As the wearer turns upon his heel, the plate will partially revolve and change its