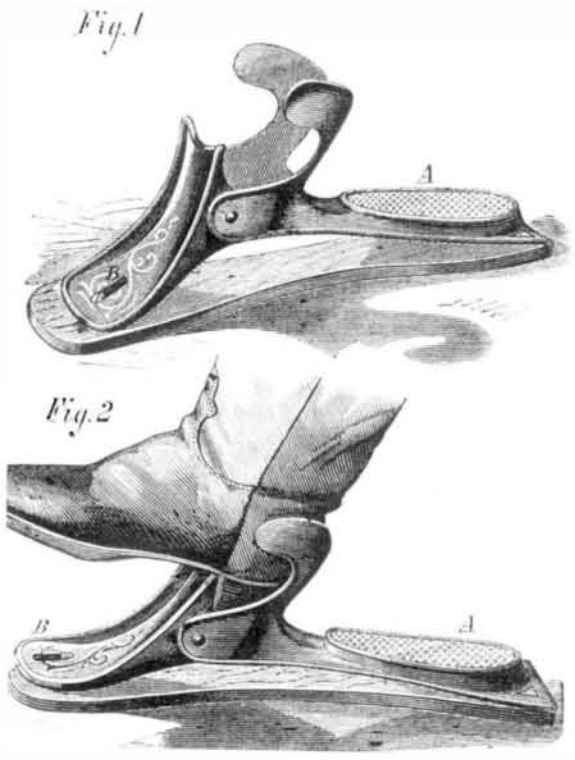
BAKER'S IMPROVED BOOTJACK.

The simple and powerful bootjack, represented in the annexed engraving, will doubtless find a ready welcome from all who expect to experience countless struggles with well soaked boots during the wet weather of the next few months, It will be noted that the device takes a firm grasp, not merely of the heel, which is liable suddenly to come off, causing the operator to sit down with more celerity than grace, but of the entire counter, tightly holding the same until the foot is extricated.

The rear portion, Fig. 1, consists of a casting, A, which is



hinged to the bedplate, and its forward portion is inclined back, and curved, to receive the boot. Pivoted to the front end is a catch plate, which is secured to the bed by a bolt, B, passing through a slot, so that the plate may slide freely in a longitudinal direction. In pulling off the boot, the latter is inserted, as shown in Fig. 2, between the catch plate and the curved part of the rear casting. The other foot is then placed upon the part last mentioned, pressing it down, thereby causing the catch plate to slide outward, so that the boot is clamped tightly between the two portions of the device. While the boot is held, the foot is withdrawn.

Patented through the Scientific American Patent Agency, December 8, 1874, to Mr. Peter H. Baker, of Virginia City, Nevada, who may be addressed for further information.

Private Pisciculture.

Mr. Seth Green, the well known pisciculturist, states that he has invented a new method for transporting and hatching nearly all kinds of fish eggs, by which spawn can be carried for one hundred and thirty days journey, and can be hatched in any room in the house. One million eggs, it is also said, can be hatched by using a pail of water daily.

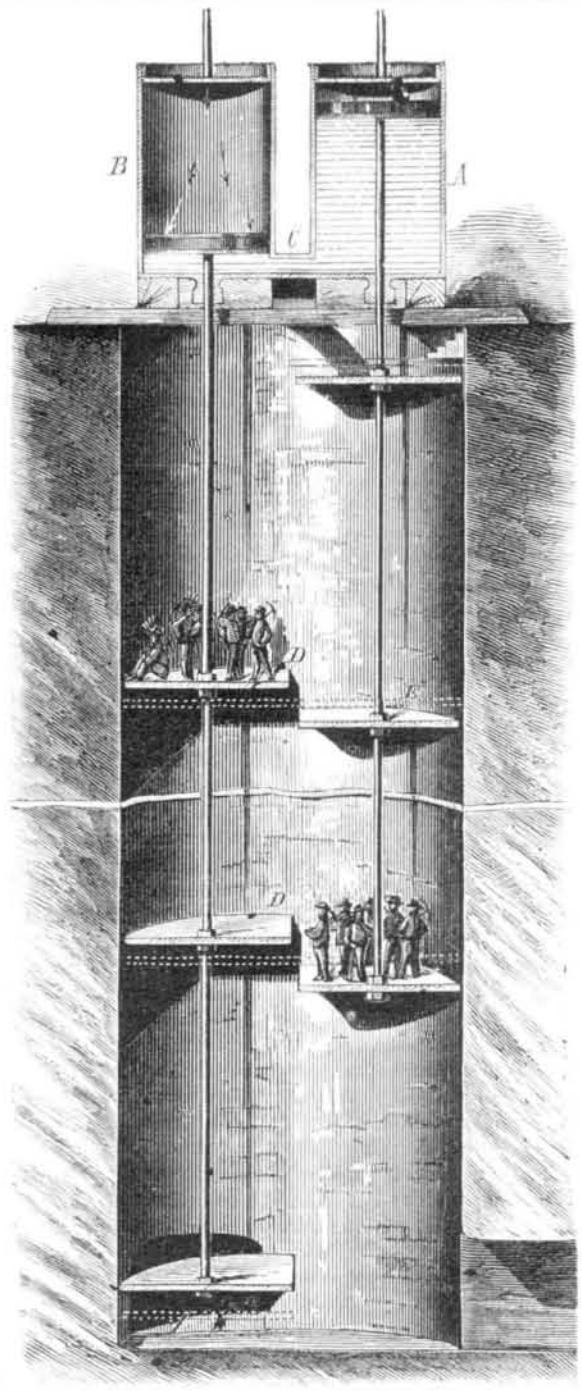
We believe that fish culture by private parties can be rendered a lucrative source of income, provided it is followed with the same care as is exercised in the raising of poultry or any other live stock. Hundreds of farmers have streams and ponds on their lands now of no value save perhaps as watering places for cattle in pasture, and yielding a few worthless perch and catfish, perhaps an occasional trout or pickerel. If Mr. Green has solved the most difficult part of the problem, namely, the successful transportation of the eggs, the mode of stocking of waters and the rearing of the fish are not difficult subjects of which to acquire an adequate knowledge. One species of fish in particular, which is little known, will, we think, prove especially remunerative, and for this reason we commend it to notice. We mean the land-locked salmon, which is a distinct species of the fish, though so closely resembling the ocean salmon as to suggest the idea that, at some remote period, a quantity of the latter fish, being by a convulsion of Nature barred from returning to the sea, had propagated in their land-locked quarters and eventually developed into a separate variety. The habits of the land-locked and ocean salmon are closely similar. The young fry of the former seem to remain in the fast water before going down to their ocean, the deep still water of the pond or lake, about the same time as those of the *salmo salar*. The average size of the fish is about one and a half pounds, though it has been captured weighing as high as eight pounds. It requires running aerated water with access to still pools. As a table fish, the land-locked salmon is said to be superior to its ocean relative; and as game it is reported to be unequaled, rising to the fly from running water even in the hottest summer days.

Steam and Water Power.

According to Mr. Batchelder's book, in 1863, where he quotes Montgomery on cotton, at Lowell or Lawrence, the interest, at six per cent, on the purchase of a mill power, and of land for the mill, will average about $15 per horse power per annum. The rent for water power, also, in cases where the mills are not owners of the water power, would appear to be from $300 to $500 per annum, per mill power of 62½ horses net, showing a rate, per horse power, of $5 to $8.33⅓ only. In Holyoke, the price is about the same. At Manayunk, Philadelphia, the rent of water power and land used to be (1863 about $60 per horse power per annum. I am not aware that the price has been diminished. To these rents should be added a comparatively small expense for labor, oiling, etc., and for repairs. It is obvious that Lowell and Lawrence, and a few places equally well situated, have, after deducting the value of land for the mill, advantages in water power which do not form, however, an average for the United States. I understand that no water companies, with such profitable terms for mills as that of Lowell, are now formed, although, in 1863, it was considered that, such is the superabundance of water power in New England and other parts of the country, it could be obtained in situations favorable for manufacturing for half the cost at Lowell. The reason, or at least one reason, is that the labor required in preparing the water power has increased, as the cost of using steam power has diminished. Another, probably, is that the cost of freight is so much higher, that this and other considerations of a like nature are of more moment, in selecting the site for a mill, than the advantage of water.—*H. Gastrell.*

THE BELGIAN MODE OF LOWERING MINERS IN SHAFTS.

Mr. J. W. Cole, of the Tanite Company, of Stroudsburg, Pa., sends us, from Brussels, Belgium, the following interesting account of his recent visit to the collieries of the *Sociétés des Charbonnages de Mariemont et Bascoup.* These large corporations own an area of some 500 square miles of coal fields, and employ 9,000 men, producing, from fourteen mines, 7,000 tuns per day. The apparatus for lowering and elevating the miners to and from their work is very ingenious, and of especial advantage where a large number of men are to be transported. Its operation will be understood from the annexed engraving, in which A and B are two steam cylinders, connected by the pipe, C, and containing water in the spaces below the pistons. The latter are attached to platforms, D and E. The parts being as shown by the full lines in the engraving, a miner steps upon platform, D. Steam is now admitted above the piston in cylinder, B, forcing said piston down, and hence driving the water into the other cylinder. This of course raises platform, E, and, as is evident, brings the two platforms on a level, when the piston in A is at its highest, and that in B at its lowest point. The miner now steps from platform, D, to platform, E. Steam is again



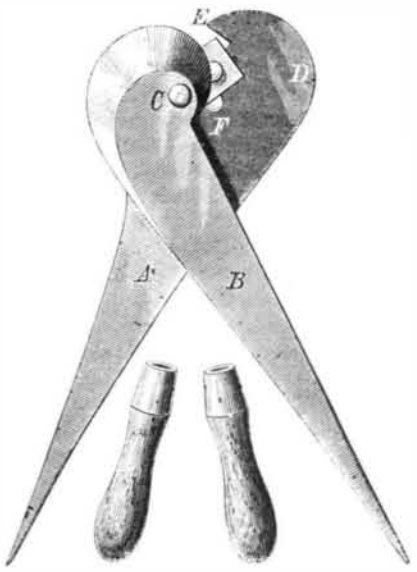
admitted, this time above the piston in A; platform, E, sinks, and eventually comes on a level with a third platform, D', secured below platform, D. This operation is continued, the workmen entering at the top and stepping from one platform to another until the bottom is reached.

The societies own 14 locomotives and 123 stationary engines; the boilers for the latter are so arranged that no fire door can be opened without closing the flue, thus avoiding the evil effects of a cold air draft.

COMBINED WRENCH AND BOLT CUTTER.

The expensive and cumbersome bolt cutters heretofore provided for blacksmiths and carriage trimmers led Mr. P. Broadbooks, of Batavia, N. Y., to invent a simpler and more effective tool for his own shop; for this he obtained letters patent, dated March 18, 1873. Recent improvements have added to the value of the invention, the moderate cost of which makes it a feature of interest to every mechanic having occasion for its use.

The engraving represents a side view, and shows the manner in which the tool is applied. A and B represent lever handles, pivoted at C. On the lever, B, is found a cam-shaped head, beveled so as to form a cutting edge on the inner side, which operates (with the head, D, of the opposite lever) like a pair of shears. The head, D, is formed with a deep notch or recess, so that it will fit on a nut, and may be used for turning the same like an ordinary wrench. This recess has an offset, E, for turning smaller nuts, and supporting them while the bolt is being cut off by the cam head. The wrench



head is also provided with a half round notch, F, for supporting wires and small rods while being cut off.

The nuts may be turned up and the bolt ends cut off with one operation of the tool. The cut is smoothly made, and an excellent finish is left. The bolt is riveted on top of the nut, as a slight flange is formed, extending a little over the edge of the nut, sufficient to hold the latter from working off. Specimens cut by this tool (one of them a seven sixteenths inch bolt), forwarded to us, fully corroborate the above.

The great power in this bolt cutter is secured by applying, close to its fulcrum, a cam-shaped cutter to a rod or bolt to be cut. The simplicity of the tool (composed of only two pieces, fastened with a rivet or bolt) insures its durability. By screwing the cam lever into a vise, or fastening it into the bench, the other lever can be operated so as to cut bolts, rods, or wires with great ease and rapidity. By removing the handles, as shown in the engraving, the shanks, A and B, form a serviceable pair of large compasses.

This wrench and bolt cutter, and one of the bolt cutters in the Broadbook system of compound tools (already illustrated in the SCIENTIFIC AMERICAN), will enable a person to reach, and cut easily, any bolt in any part of a vehicle, and the two tools together cost less than one of the bolt cutters now in common use.

Arrangements will be made with manufacturers to make this combined wrench and bolt cutter on royalty. For full particulars address Broadbooks & Co., Batavia, N. Y.

THE ANTHRACITE COAL HARVEST OF 1874.—The total quantity of anthracite coal mined in Pennsylvania, in 1874, was twenty-one millions six hundred thousand tuns, or over five hundred and sixty millions of cubic feet. Placed in one mass, this would form a solid wall one hundred feet high, one hundred feet wide, and nearly eleven miles in length.

If a shaft springs in running, the trouble lies probably in either a too small diameter of the shaft for its weight and velocity, a set of unbalanced pulleys, or an unequal strain on either side by the belts.

Correspondence.

Animal Suicides.

To the Editor of the Scientific American:

A few weeks ago I saw in your paper an account of a scorpion stinging himself to death while being burnt with a sun glass. He did not intend to commit suicide; it was a mere accident on his part. I lived in Brazil for several months, and I have seen more than a dozen sting themselves to death. I used to take a straw or small stick, and lay it across their backs and hold them down with considerable force; and they would turn their tails over and feel very carefully for the straw, and then draw back and strike at it; and often the sting would strike the straw and split it, and so enter the body.

I have taken an iron ring, about 4 or 5 inches across, and heated it black hot and put it over them; and when they began to feel uncomfortable, they would strike all around with their tails. But I never knew one to sting himself. At one time I enclosed two of them within a hot ring; and when they began to feel the heat, they went at each other with their stings, and in a short time they were both dead.

Lynn, Mass. S. A. T.