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Improved Portable Stump Extractor.

The engraving presents a longitudinal vertical section of a stump extractor, which being mounted on wheels, may be readily moved from place to place, and yet which remains firmly fixed in place, without blocking, while in use. The lower portion of the frame is V-shaped; the open ends of the V at the rear. This portion is supported on braced uprights, forming bolsters that rest on the two axles. Rising above this bed is a very strong, thoroughly braced superstructure, which receives the immediate strain of the lifting chain. This chain is attached at one end to a hook, A, and descending receives in its bight the hook sheave, B, from whence it passes over the fixed sheave, C, to an iron drum, D, the surface of which is formed with depressions to receive the links of the chain. This form of construction of the drum, with the fact that the chain passes around about two thirds of its circumference, proves sufficient to hold the chain without slipping under the heaviest strain, and permits it to pass freely to the ground over the pulley, E.

In operation, if the stump is not too large, or too firmly held, the drum may be rotated by means of one or two cranks, F, which give motion to a pinion the teeth of which mesh with those of the large gear on the drum, D. To hold the strain thus obtained the pinion shaft carries a ratchet with the teeth of which a pawl engages.

When, however, some power greater than manual is required, a rope is led from the circumference of the small drum, G, under a pulley, H, to the yoke or whiffletree of a pair of oxen or horses. A handle, I, with clutch attached, serves to throw the pinion and drum, G, in or out of gear. The power exerted by either of these methods is immense; the most obdurate stump, however firmly held in the soil, must yield to it. The machine is applicable also to lifting and conveying heavy stones and other weighty bodies.

Patented through the Scientific American Patent Agency, by C. C. Manuel, North Troy, Vt.

For particulars concerning the patent address O. N. Elkins, North Troy, Vt.

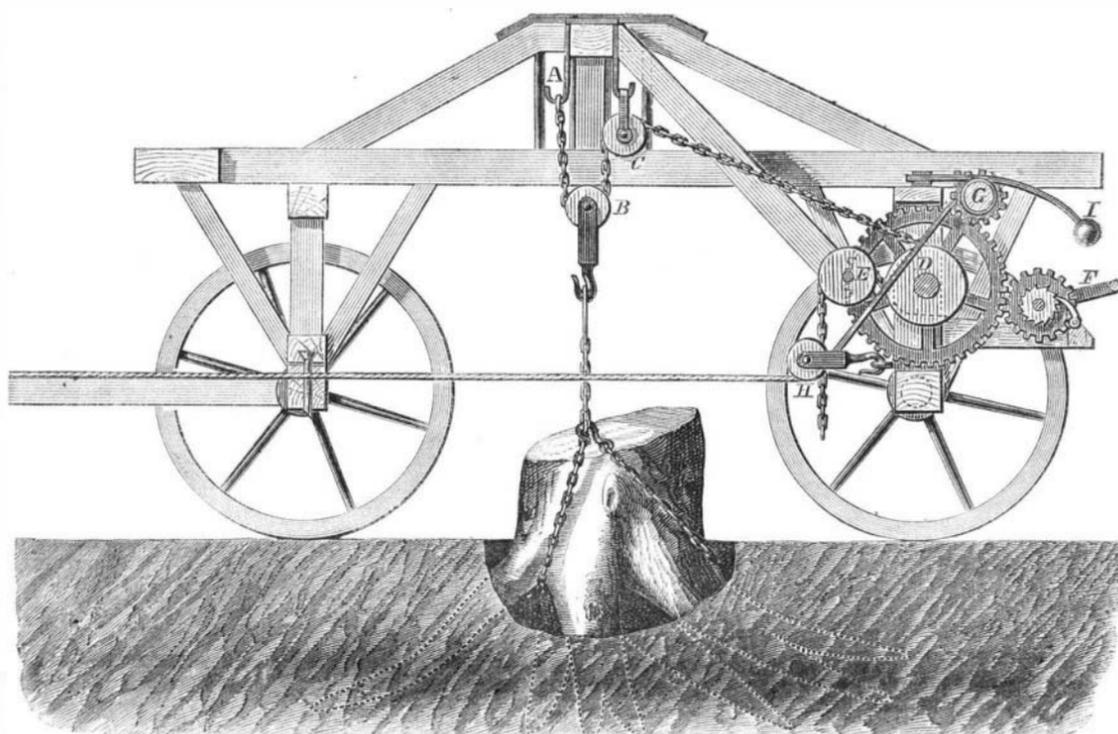
The Chicago River Tunnel.

Work on this tunnel is rapidly progressing, and there is little doubt that this great thoroughfare may be opened in the early spring. The obstructions are to be removed from the river by December 1. From 300 to 400 men are employed on the work, and the whole is pushed forward to completion as rapidly as possible. Six hundred and sixty-five feet of the arching are already finished, leaving 265 feet still to be built. The east excavation is now 80 feet inside the river bed. On the west side the excavations are within 25 feet of the river. The general plan of the tunnel is already known. Single passages, for horse and foot separately, are built to the water's edge, where the passage is doubled for the carriage way, extending 220 feet, one side for going east, and the other side for going west, thus preventing any danger of collision. The footpath is six feet above the carriage road, in the middle of the tunnel. When all the arches are completed the top is to be covered with masonry, making all level; over this will be a coating of government asphaltum, poured on hot, and thus running into and filling all the seams, and forming a water-tight sheeting; over this, again, large, heavy flag stones, of the usual white stone are to be laid, and the joints filled with asphaltum. Then the water is allowed to flow over all. Between each course of brick in the arches is a half inch of cement. Beneath the center of the passage-way, under foot, is a sewer 120 feet long—over 100 feet of which is now built—leading to a well in the center of the tunnel bottom, into which all water accumulating in the tunnel flows, and is pumped up by a powerful engine to the surface and back to the river. The cost of the tunnel for material and labor is about \$8,000 per week. The original contract was \$328,500, but the actual cost will be not less than \$500,000.

Carbonization of Wood.

M. Gillot, in his memoir to the French Academy of Sciences on this subject, says, the only of condition essential for the

production of good charcoal is, that the operation shall proceed slowly. The decomposition of wood commences at about the boiling point of water. During the decomposition the production of carbonic acid causes a development of heat in the retort greater than that out of it, when the heat applied approaches 300°C. Too rapid an increase of internal heat gives rise to the formation of tar and gaseous products diminishing in a corresponding degree the useful accessory products, as well as the yield of charcoal. The condensed products contain the largest proportion of acetic acid (about 28 per cent.)

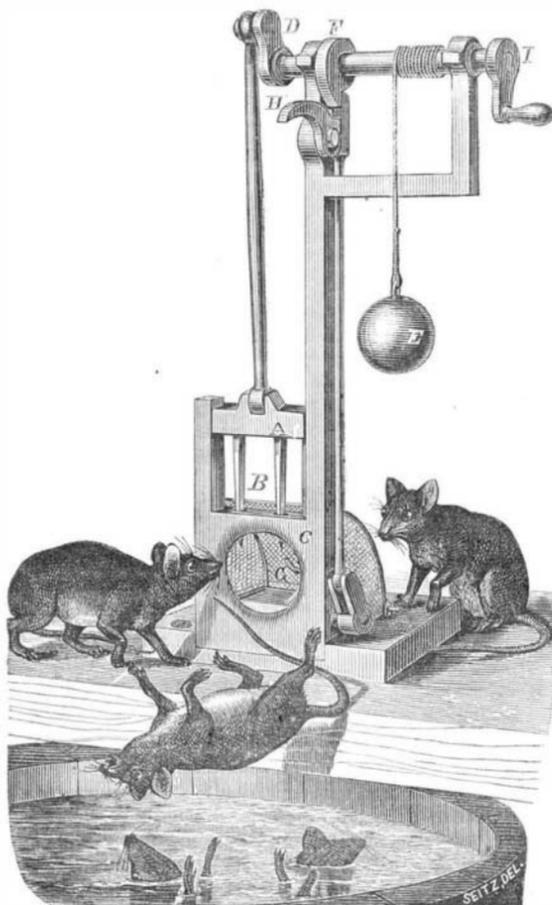


MANUEL'S PATENT STUMP PULLING MACHINE.

when the temperature of the oven is 218°C. In this way a given amount of wood will yield about two-thirds in weight of charcoal, and 7 or 8 per cent of acetic acid.

WOODSIDE'S PATENT SELF-SETTING ANIMAL TRAP.

The destruction of vermin seems to be a necessary condition of human comfort, and although the process appears, at times,



to be cruel, yet it is difficult to see how it can be avoided. The engraving presents a view of a self-setting trap, intended as a trap for catching wild animals as well as our domestic vermin. The description of the engraving, as applicable to rats,

will suffice to explain its employment for other purposes. It is, in fact, an adaptation of the guillotine, the broad, decapitating knife being replaced by two blades intended for piercing the necks of the animals. It is fixed for rats, on a bench or table, in front of which stands a tub or bucket of water to receive the victims.

The lower part of the frame has an opening sufficiently large to admit the head of a rat, and over it is a slide or cross-head, A, having fixed to it two knives, B, guided through suitable slots, in the head piece, C. The crosshead is attached by means of a pitman to a crank, D, on a horizontal shaft at the top of the frame, on which is coiled a line suspending a weight, E, the falling of which allows the crosshead to fall when the rat releases the catch holding the shaft, and also raises it again instantly, thus resetting the trap.

On the horizontal shaft is a cam or single-toothed ratchet, F, the point of which engages with a snug on an upright sliding bar, pivoted at its lower end to a crank, to the shaft of which is secured a bait hook, G, inside the trap. A guard of wire net, or other material, prevents the rat from reaching the bait, except through the opening, on the side, C, under the knives. When the bait is tampered with, the snug on the upright sliding rod is disengaged from the catch of the cam, F, allowing the shaft to revolve and the crosshead, with attached knives, to fall. The snug on the upright sliding rod also engages with a projection on the rear of a pivoted hook, H, and, when disengaged, partially revolves the hook, throwing its long arm under the cam, F, which, as it swiftly revolves, throws the hook, H, back into place and resets the trap by raising again the upright sliding rod.

The operation can be readily understood from the above description. The weight, E, brings the knife block down with great rapidity, and it is so rapidly raised again, that, as the inventor states, the blood of the rat does not have time to stain the knives and deter others from taking the place of the victim, who rolls over into the bucket of water. The handle, I, is for winding up the weight.

This device was patented through the Scientific American Patent Agency, April 28, 1868, by Wm. J. Woodside, who may be addressed at Zanesville, Ohio.

Machine for Recording Votes.

The *Post* thus describes the new vote-recording machine which, we are informed, is to be used in the Assembly Chamber at Albany:

"By means of the machine which is to be put up in the Assembly Chamber the members will vote simultaneously. There is a dial like a large face of a clock to indicate the yeas, and another to indicate the nays. These dials contain the numbers of all the members, and each pulls a knob, communicating by a wire, as the bells do in a hotel, with the dial; his number flies out as he pulls, and he sees that his vote is recorded. If he desires to change his vote he does so by a request to the clerk.

"By turning a little crank the hand on the dial is made to point out the number of votes that have been cast both for and against the bill; and by another simple process the names of those voting both in the affirmative and negative are printed for the use of the clerk on a slip of paper. The whole process of taking the vote, recording it, and printing the name does not require more than half a minute. In that way over a hundred bills can be passed in an hour."

It is computed that this machine will be a great saving to the State in shortening the sessions of the Legislature. Certainly it will save the clerk's lungs.

RUSKIN, the eminent art author of England, who has lately turned his attention to political economy, in a recent letter urges the purchase of all the railroads in England by the Government. He argues that private persons should not be permitted to own the railroads of a nation; that all means of public transit should be provided at public expense; that neither railroads nor canals should ever pay dividends to anybody, but should pay their working expenses and no more, and that the whole work of carrying persons or goods should be done as the carriage of letters is now done.