H. E. Torrle,

Nail Extractor.

No. 33,218. Patented Sep. 3, 1861.

Fig. 2.

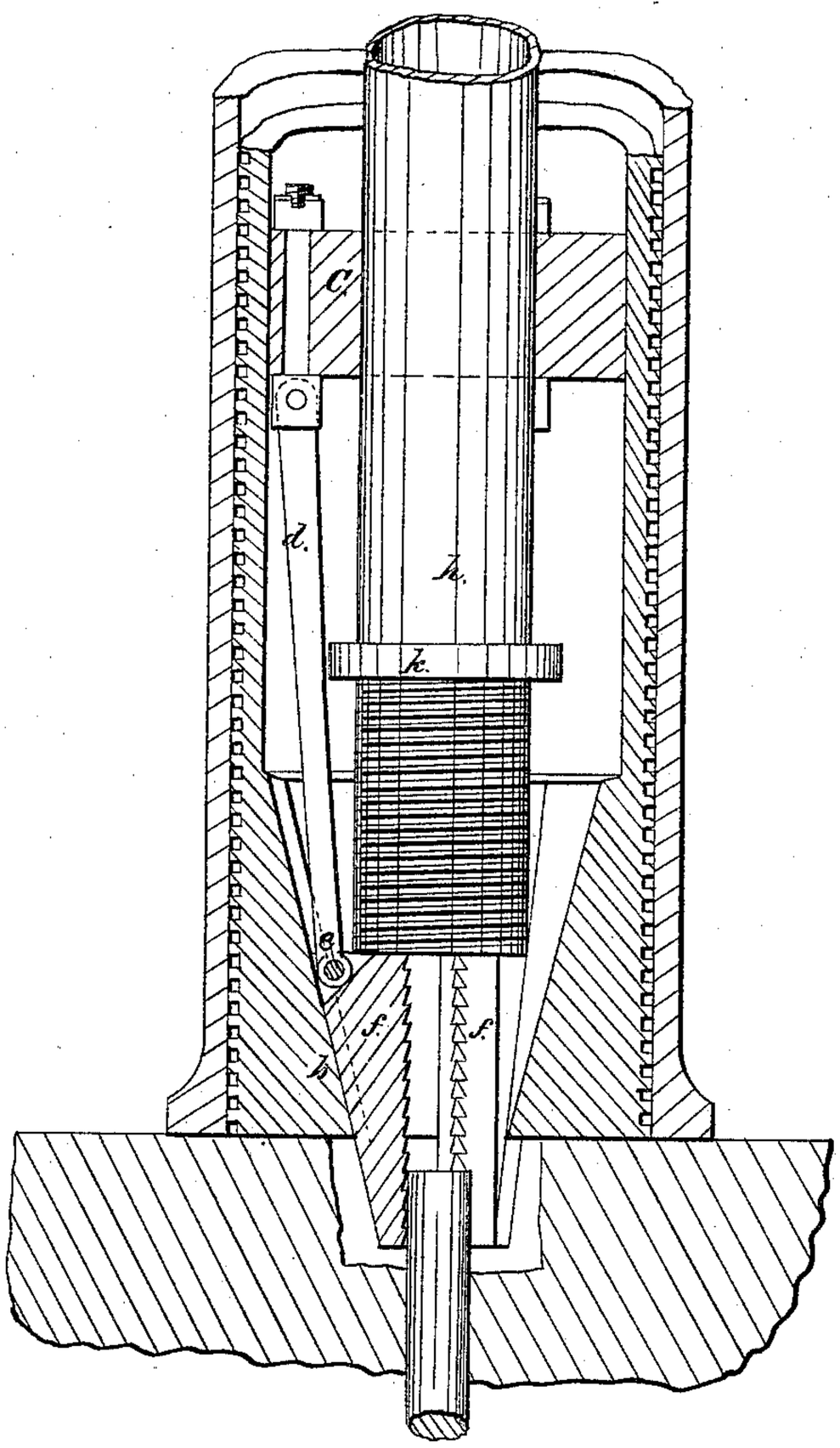


Fig. 3.

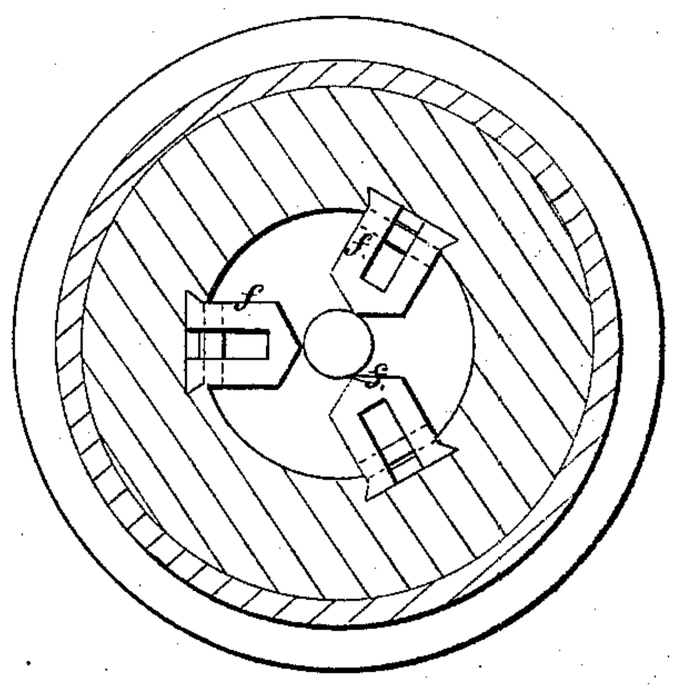
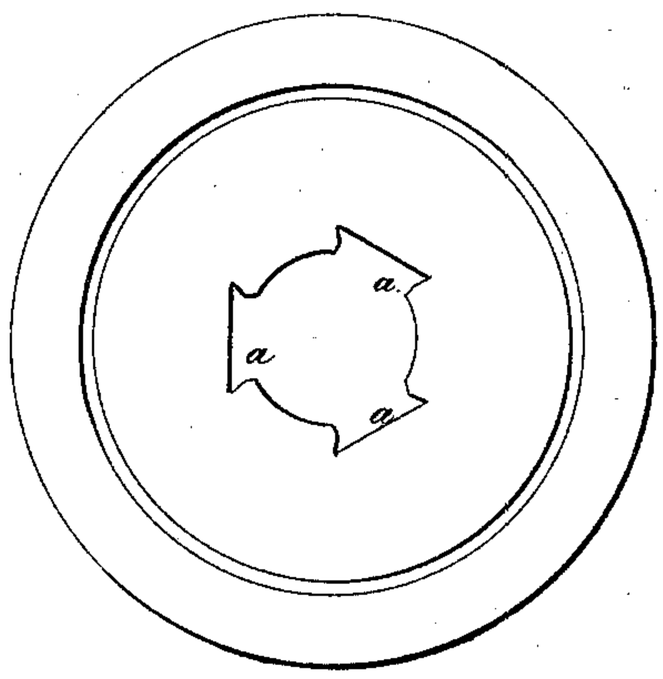


Fig. 1.



Witnesses:

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UNITED STATES PATENT OFFICE.

HAMILTON E. TOWLE, OF EXETER, NEW HAMPSHIRE.

MACHINE FOR DRAWING BOLTS AND SPIKES.

Specification forming part of Letters Patent No. **33,218**, dated September 3, 1861.

To all whom it may concern:

Be it known that I, HAMILTON E. TOWLE, of Exeter, in the county of Rockingham and State of New Hampshire, have invented a new and useful Improvement in Bolt-Drawing Machines or Bolt-Drawing Forceps, as such machines have heretofore been termed.

It is well known that in the employment of bolt-drawing forceps as heretofore made the jaws or dies have been made to open to receive the end of the bolt to be drawn by means of a spring so arranged as to force the jaws apart, and it is also known that in cases where the end of the bolt is formed into a head or upset by riveting, so as to be larger than the body of the bolt, and also in the case where the projecting part of the bolt to be grasped is more or less crooked, that the capacity of the spring to produce sufficient lateral motion of the jaws to admit the bolt in such cases often cannot be obtained, thereby preventing the application of the instrument to the bolt. Also, in bolt-pulling machines as heretofore constructed it is absolutely necessary that the end of the bolt to be drawn shall project from and beyond the exterior surface of the material into which it has been driven, in order that such projecting part may reach up into the interior of the bolt-pulling instrument to afford sufficient hold to the jaws or dies.

The nature of my improvement consists in connecting together and arranging the jaws or dies which grasp the bolt in such a manner that they shall move laterally without the use of a spring by means of a peculiarly-formed groove, and also by being guided by such groove be enabled to firmly grasp a bolt, the end of which is exterior to the body of the instrument.

To enable others skilled in the art to make and use my improvement, I will proceed to describe its construction and operation; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon, all of which form a part of this specification.

Figure 1 is a plan of lower end of a bolt-drawing machine. Fig. 2 is a vertical section of lower part of same on A B. Fig. 3 is a horizontal section taken at upper end of jaws on the line C D.

Same letters refer to like parts.

I dispense with the use of a spring to open the jaws when being drawn back by compelling each of them to follow a dovetailed groove *a a a*, Fig. 1, which is inclined, as shown at *b* in Fig. 2.

The jaws *f f*, Figs. 2 and 3, are made to advance and recede simultaneously an equal amount by being connected together in the following manner: A movable piston or plunger *c*, Fig. 2, is made to receive the upper ends of articulated links *d d*, (only one of which is shown in the drawings,) which reach down to and are connected with the jaws by means of joints at their lower ends, as shown at *e*.

The object of my improvement is to overcome the before-mentioned objections and obtain more lateral and a freer motion of the jaws or dies than is obtained with the use of a spring to cause the jaws to open when being drawn back and approach while being pressed forward, and also to confine the motion of the jaws to a dovetailed groove, so that if even a portion only of the jaws remain in the groove the remaining portion, projecting below and outside of the end of the part in which the grooves are cut, may, by slightly excavating around the head of the bolt to be drawn, be applied to it (the exposed portion of the bolt) and made to grasp it with sufficient force to extract the bolt by putting the machine into operation, not requiring the removal or excavation of any more material than is actually required to introduce the ends of the jaws only, thus not requiring the end of the bolt to be sufficiently long to reach up into the body of the instrument, as is the case in bolt-drawing machines as now made.

The operation of a bolt-pulling machine with my improvement is as follows: First, for a bolt the end of which projects sufficiently to enter the interior part of the machine, the jaws are drawn back by means of the pipe or ram *h*, Fig. 2, which has a collar *k* upon it, which lifts the piston or plunger *c* till the bolt can be introduced, whose greatest diameter, if desired, is as great as the diameter of the hole at the bottom of the instrument; or to admit, as in the usual case, an ordinary-sized bolt which is more or less crooked without any derangement of the parts, the jaws, being forced down their dovetailed grooves,

now grasp the bolt with sufficient force to withdraw it when the machine is set in motion. For the case where the bolt has the end to be grasped below the surface of the material into which it is driven, a suitable tool must first be used to excavate a small space immediately surrounding the part to be grasped, when the projecting ends of the dies or jaws may be made to close upon it as in first case, and by operating the machine the bolt may be extracted, the jaws being sustained during the operation by their dovetailed grooves, thus being able to draw a bolt whose head is below or even with the surface of the wood, which is an important advantage.

I do not claim the construction of the lower end of a screw internally in the form of the frustum of a cone; nor do I claim making the exterior surface of the jaws to correspond to a conical cavity. Neither do I claim the use of a screw as a means of extracting bolts. Further, I do not claim the pipe or ram *h* with projections upon its opposite sides to act directly upon bails or handles upon the jaws as they have been constructed, combined, and arranged previous to my invention; but

What I do claim is—

1. The combination, with the jaws of bolt-pulling machines constructed and arranged to operate substantially as described, of grooves which are larger at or near the back part of them than farther forward, making substantially dovetailed grooves, in which the jaws are positively guided by having their exterior surfaces fitted to them so as to slide freely in the grooves and operate substantially as described.

2. In combination with the jaws of bolt-pulling machines, the links *d*, having joints at either or both ends, by which the jaws are moved in the dovetailed grooves, substantially as described.

HAMILTON E. TOWLE.

Witnesses:

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