

W. H. BOUSER.
Earth-Boring Machines.

No. 139,761.

Patented June 10, 1873.

Fig. 1.

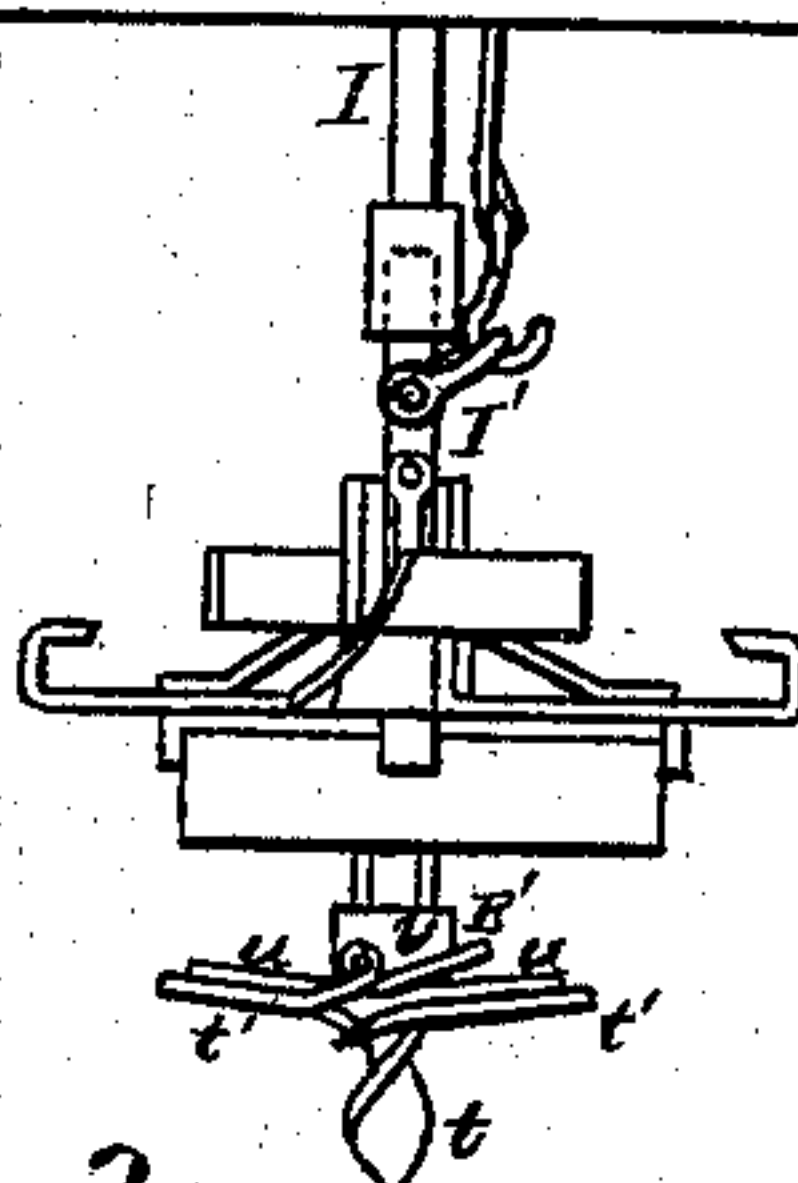
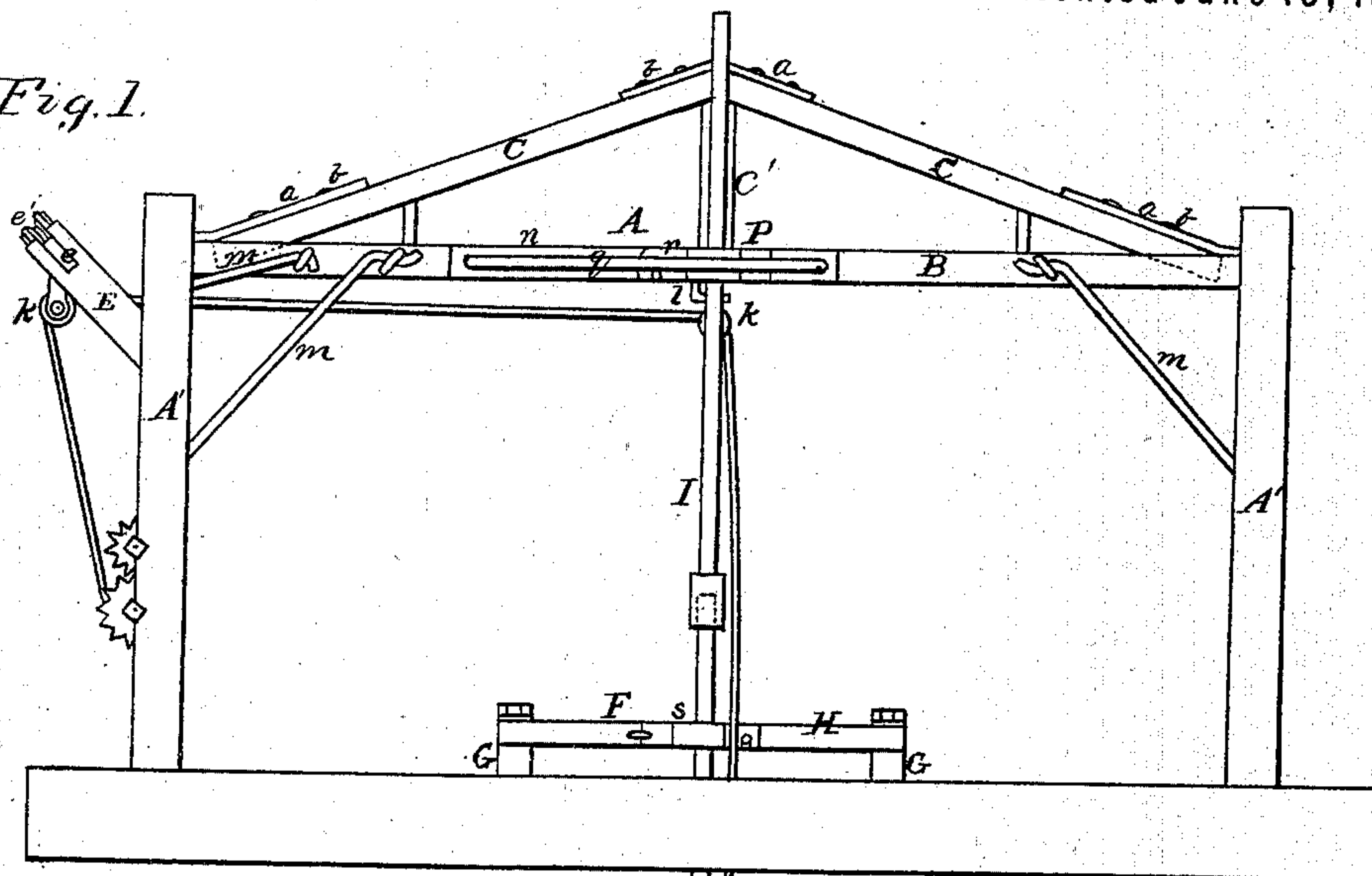


Fig. 2.

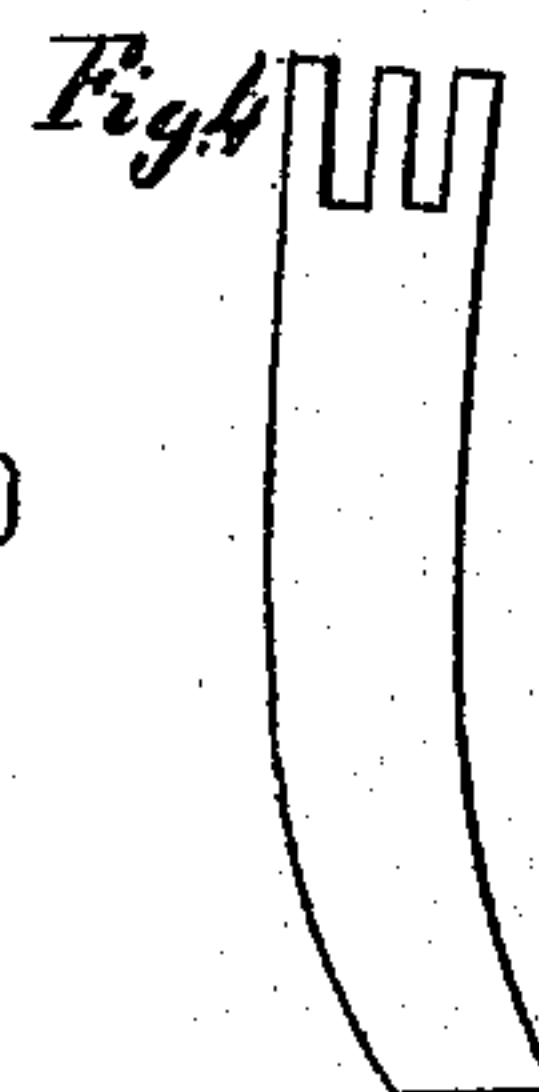
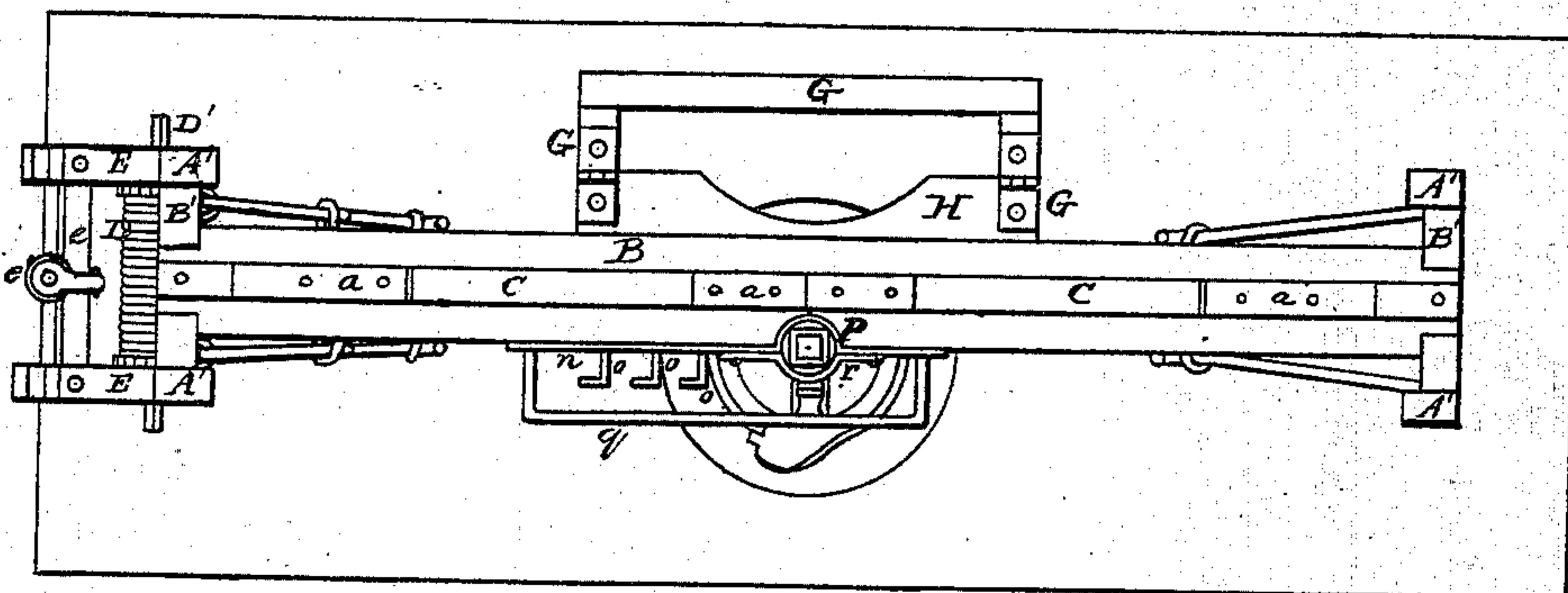
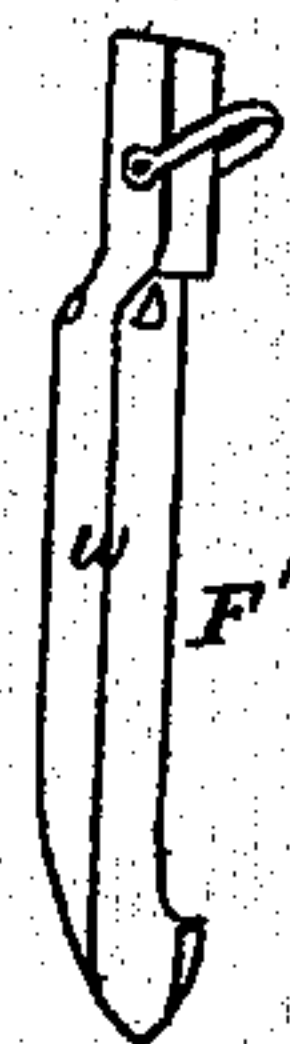


Fig. 3.



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Fig: 5.

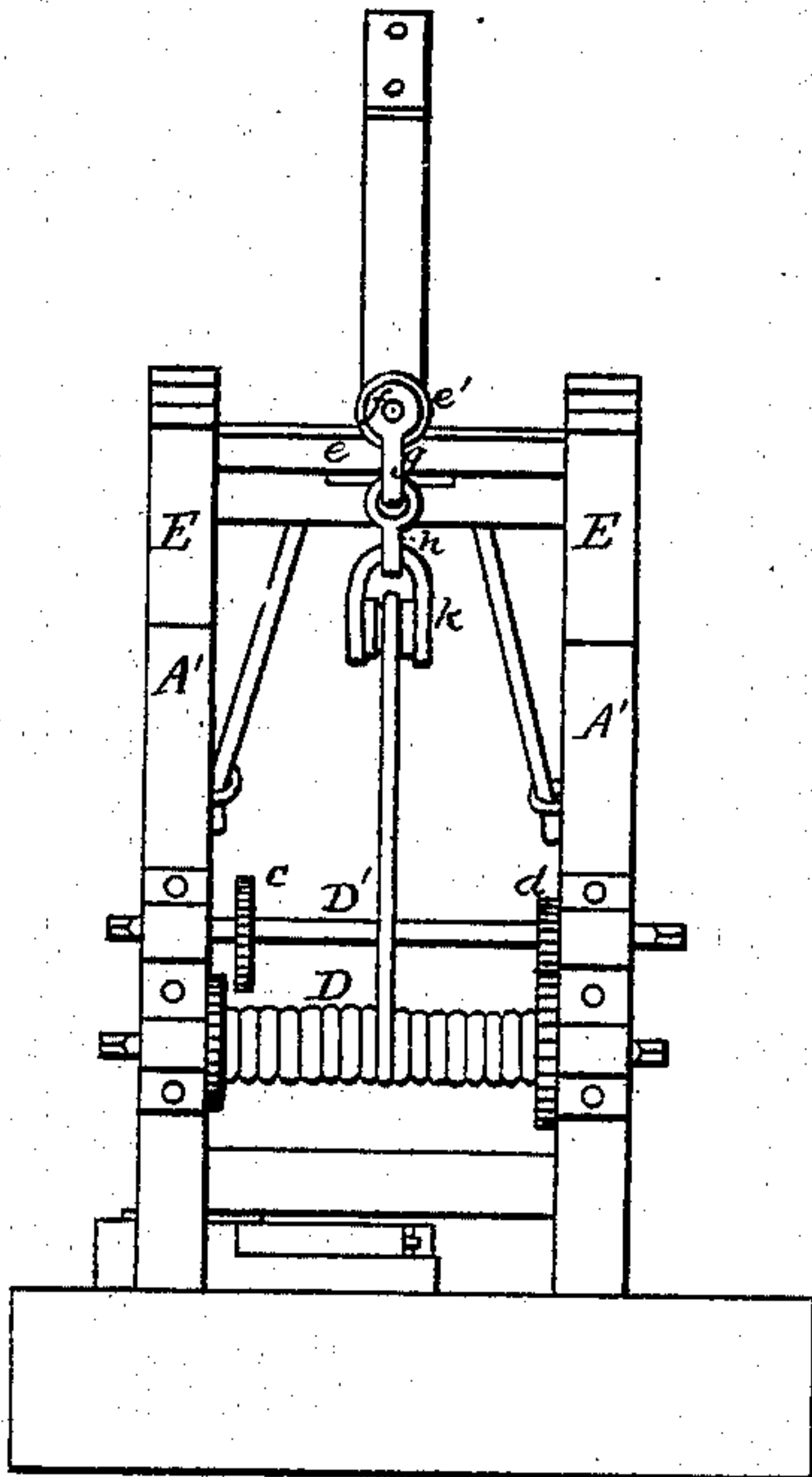


Fig: 6.

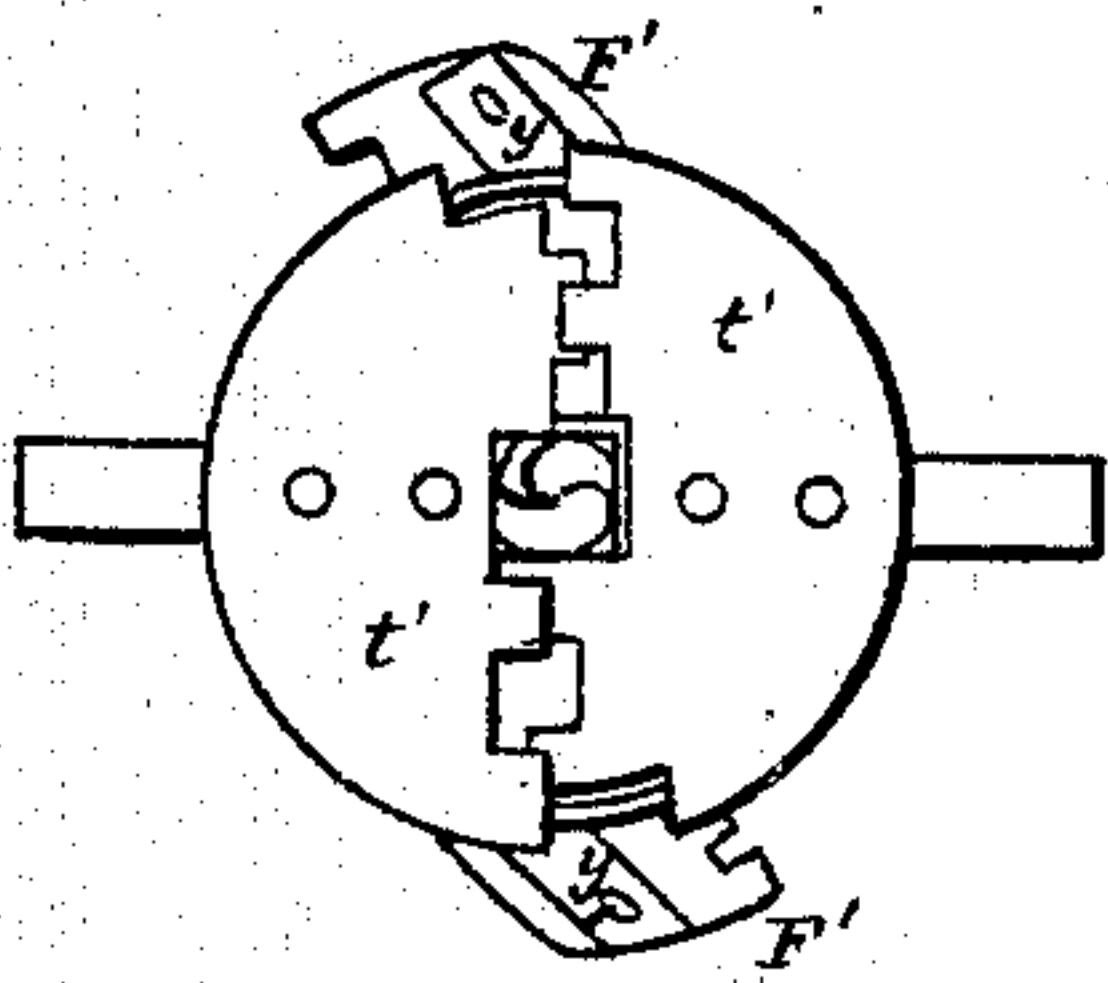


Fig: 7.

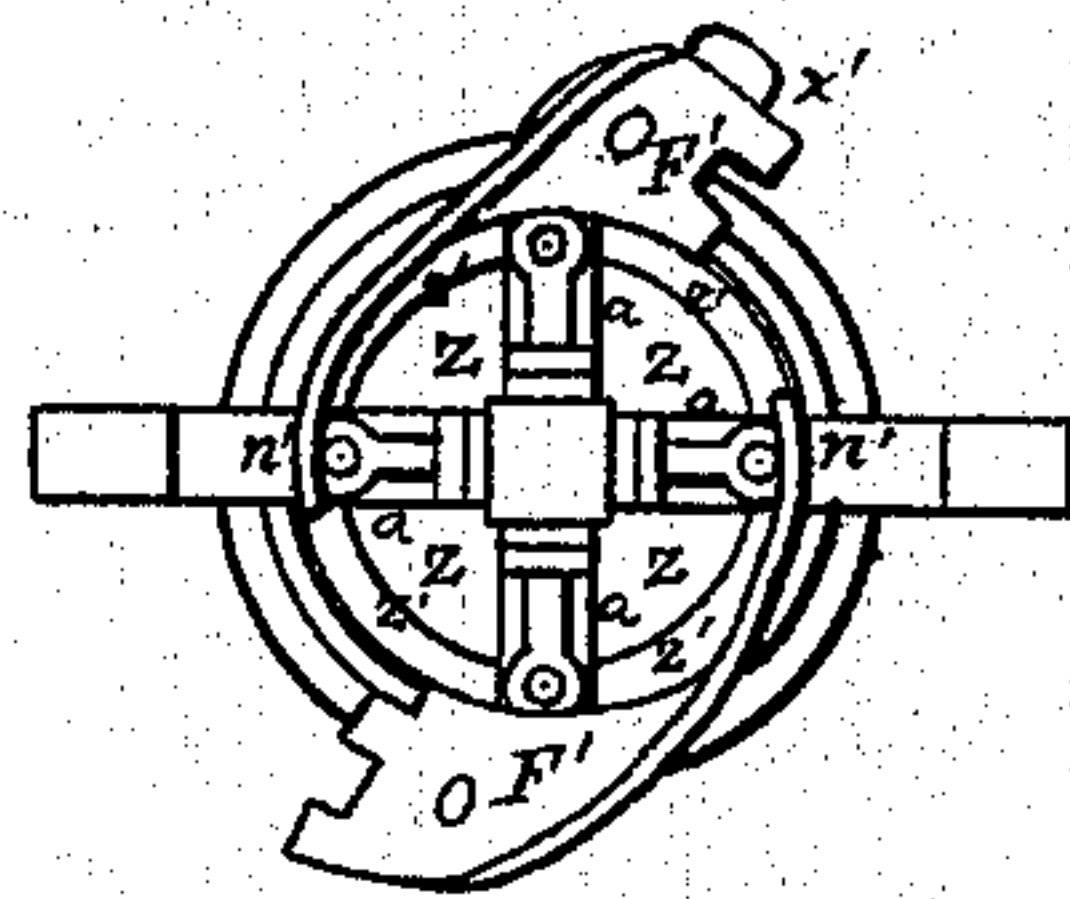
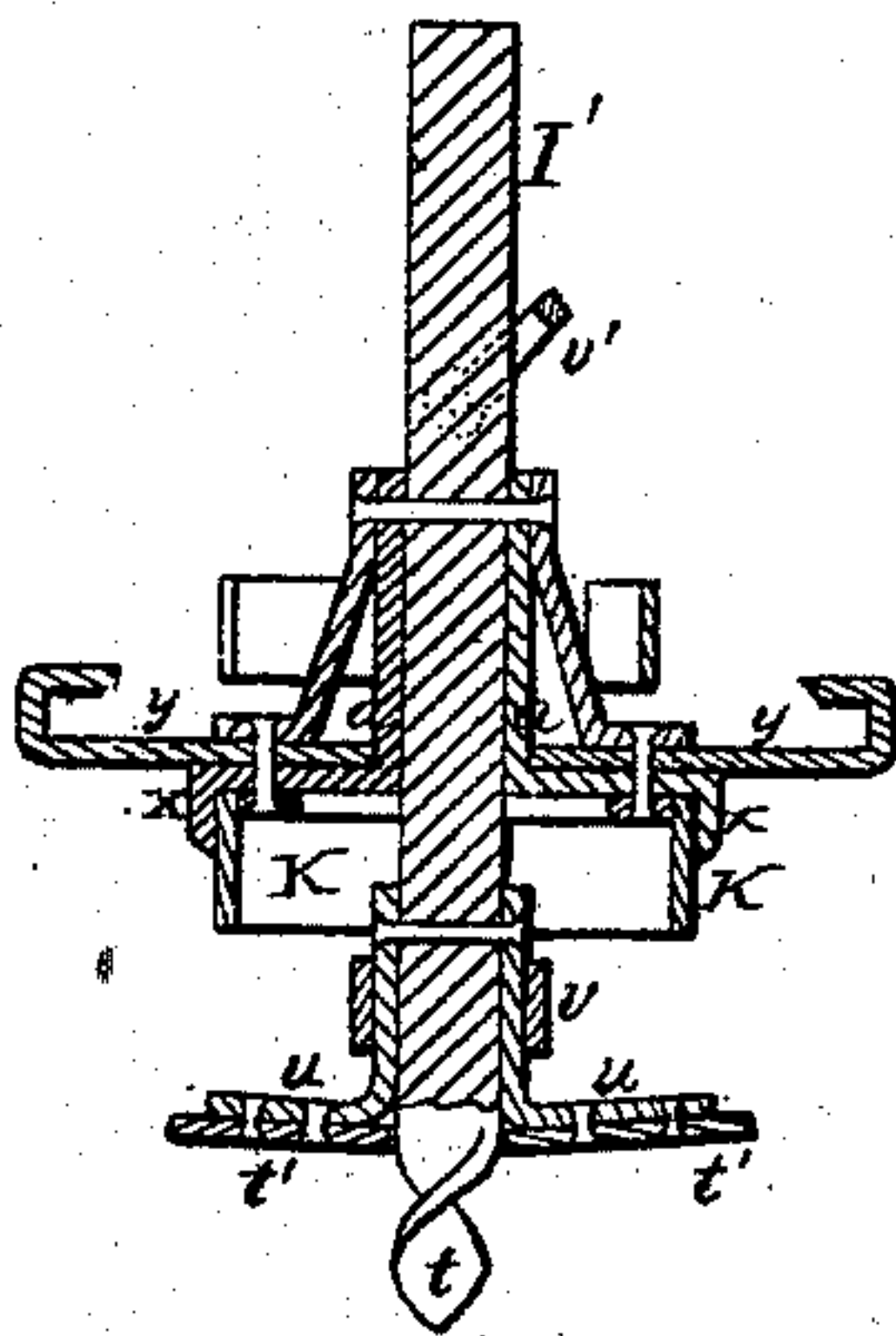


Fig: 8

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UNITED STATES PATENT OFFICE.

WILLIAM H. BOUSER, OF PARIS, ILLINOIS.

IMPROVEMENT IN EARTH-BORING MACHINES.

Specification forming part of Letters Patent No. **139,761**, dated June 10, 1873; application filed April 5, 1873.

To all whom it may concern:

Be it known that I, WM. H. BOUSER, of Paris, in the county of Edgar and State of Illinois, have invented a new and valuable Improvement in Well-Augers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a side view of my well-boring machine. Fig. 2 is a top view of same. Figs. 3 and 4 are details of same. Fig. 5 is an end view of same. Fig. 6 is a bottom view of my well-auger. Fig. 7 is a section of my well-auger. Fig. 8 is a top view of same.

This invention relates to certain improvements in well-boring mechanism; and consists in the construction and novel arrangement of the windlass and its two sets of proportioned cog-wheels, one set designed to communicate power, and the other set serving to increase the speed in the raising and lowering operation of the bar and traveling-pulley in connection with the windlass, whereby the winding-friction is lessened; of the devices for holding and supporting the shaft; of the parts composing the lower frame, whereby the shaft is held in an upright position after it has passed below the upper frame and of the parts composing the auger and its shaft.

In the accompanying drawings, the letter A designates the frame. This consists of the end standards A' having the cross-bars B'; the horizontal beam B let into the upper cross-bar at each end, and shouldered to abut against the same from the inside; the upright strut C', and the removable braces C meeting above the strut, let into the horizontal beam within the shouldered portion, and fastened by metallic straps *a* and suitable bolts *b*, as indicated in the drawings. D designates the windlass, provided with gear-wheels at its ends of similar or different dimensions, and journaled in suitable seats attached to one of the ends of the frame. Above the windlass is also journaled, in similar seats, the sliding crank-shaft D', having secured to its ends the gear-wheels *c* *d*, of different diameters,

designed to be brought into connection with the gear-wheels of the windlass at different times, according to the requirement of the work with respect to speed or power. Above the windlass, the short bracket-beams E are secured to the end of the frame, and connected by the traveling-bar *e* let into the forked ends of said bracket-beams, and secured therein by suitable fastening devices. On the bar *e* is arranged the traveling-pulley *e'*, having the long cheek-bars *f* embracing the bar *e* and terminating in a loop, *g*, which is provided with a hook, *h*, for suspending the pulley-block *k*. A similar pulley-block, *k*, is suspended on the hook *l*, secured to the middle of the beam B. Removable corner-braces *m* serve to strengthen the ends of the frame at the junction of the standards and the horizontal beam. A plate, *n*, having horizontally-bent hooks *o*, and a concave bearing, P, is secured to the side of the beam B at its middle portion, a bent bar, *q*, extending horizontally outward therefrom. *r* indicates a pivoted cap secured to the bearing P. F indicates the lower frame, consisting of the bed-blocks G and the hinged platform H, extending partly over the well-opening and provided with the bearing-plates *s*. The rear-edge of the hinged platform is concave, and when the platform is thrown backward this concave edge serves to widen the space between it and the well-hole. I designates the sections of the shaft, I', the lowest section, forming the stem of the auger. The lower end of this section is of steel, drawn out in diamond-shape and twisted to form the point *t*. To this stem are secured, by means of the band *v* and suitable bolts, the lower L-shaped arms *u*, to which the auger-blades *u'* are attached. The cutting-edges of the auger-blades consist of a series of rectangular teeth and intermediate rectangular indentations, being suitably beveled, bent downward, and sharpened. The other ends of the auger-blades, which are of the usual semicircular form, are bent upward and curled to form barrels for the hinge-pins connecting therewith the gates or valves E'. The upper arms *a*, also L-shaped, are bolted to the stem I', and are bent downward at their outer ends *x* to hold the loose cylinder or bucket K in place and to center the auger in loose earth. Four of

these upper arms are employed, one attached to each side of the rectangular stem. To the opposite arms are secured the bed-plates *y*, to which the reamers *F'* are secured in such a manner that these reamers are directed downward and somewhat outward. The cutting-edges of these reamers are oblique, and are serrated or toothed in a similar manner to that described above with reference to the auger-blades, and the blades are extended rearward and bent inward toward the center, and at the same time twisted into the vertical position, as shown at *u'*, so that the earth gathered by the front ends or cutting-edges is conveyed toward the center and deposited, through the opening *z*, between the arms *a* and the circular braces *z'*, which are bolted to said arms near their ends. To the other two opposite arms are secured guides *y'*, which extend as far as the reamers, and serve to balance the same in soft earth. The circular cutter-flange *x* is sometimes formed on the end of the reamers. The staple or loop *v'* is pivoted to the stem *i'*, and serves for the attachment of the hook of the windlass-rope. *F''* indicates the small auger used for boring small holes in the bottoms of wells, when it is not desirable or practicable to go deeper with the large auger. This auger is constructed by bending a steel-plate, of the form indicated in Fig. 4, so that its oblique end shall form a half funnel-shaped point, as indicated in Fig. 3, the entire stem of the plate being bent to form the vertical curved stem *w*. The operating-lever has a metallic hook bolted to its end, which is still further secured by means of a metallic band. The bend of this hook has its inner edge parallel with the end face of the band, and the shank of the auger is designed to be grasped between said edge and end face.

In the construction and arrangement of the serrated edges of the auger-blades the indentations of one blade are made to follow in the path of the teeth of the other, whereby very refractory or tough soil may be effectively operated upon. The reamers cut the side wall of the well. The wall of the lower opening, made by the auger-blades, is circular in shape, of smaller diameter, and forms a bucket-wall for the auger until full, when the load is easily drawn as it passes up at once into a larger space. The loose bucket keeps a position near the top of the auger and prevents the load from toppling out; at the same time it facilitates the unloading operation. In boring, the first section of the shaft is operated in the journal-seat of the upper frame, and as

it descends into the ground is secured in the lower journal-plates, the upper seat being opened for the introduction of the next section. When the bucket is to be drawn up the lower platform is thrown backward, and the bucket, being raised, is secured to the rests *o* of the horizontal beam. The sections succeeding the first, in boring, need not be secured to the upper journal-seat. In raising the auger out of its bed the small cog-wheel on the crank-shaft is employed in connection with the wheel at one end of windlass first, in order to obtain the requisite power. After the auger has been lifted free into the larger opening the other gear-wheel is brought into connection with the wheel at the other end of windlass, to obtain speed in raising and lowering the same. Favorable results are obtained by making the diameters of the first set of wheels in the proportion of about one to five, and of the second set of about one to two. By the use of the transverse bar and traveling-pulley the wear of the rope on the windlass is much lessened.

What I claim as new, and desire to secure by Letters Patent, is—

1. The ground-frame, consisting of the bed-blocks, and the hinged platform having the journal-seat secured to its front edge, substantially as specified.
2. The combination, with well-boring mechanism, of the windlass, crank-shaft, and the adjustable gearing arranged at each end of said crank-shaft to increase the power or speed at will, substantially as specified.
3. The combination, with the well-boring mechanism, of the windlass, the forked supporting-arms, the removable transverse bar, and the traveling-pulley, substantially as specified.
4. The reamers, having their cutting-edges serrated and inclined outward and downward, and having the extensions bent rearward and inward to guide the soil to the center, substantially as specified.
5. The auger, consisting of the stem, the L-shaped arms, the upper reamers, the lower blades, and the loose bucket, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM HENRY BOUSER.

Witnesses:

E. C. WOOLLEY,
JAMES A. DICKENSON.