

No. 693,801.

Patented Feb. 18, 1902.

R. L. LEAVERTON.
POST HOLE DIGGER.

(Application filed Apr. 27, 1901.)

(No Model.)

2 Sheets—Sheet 1.

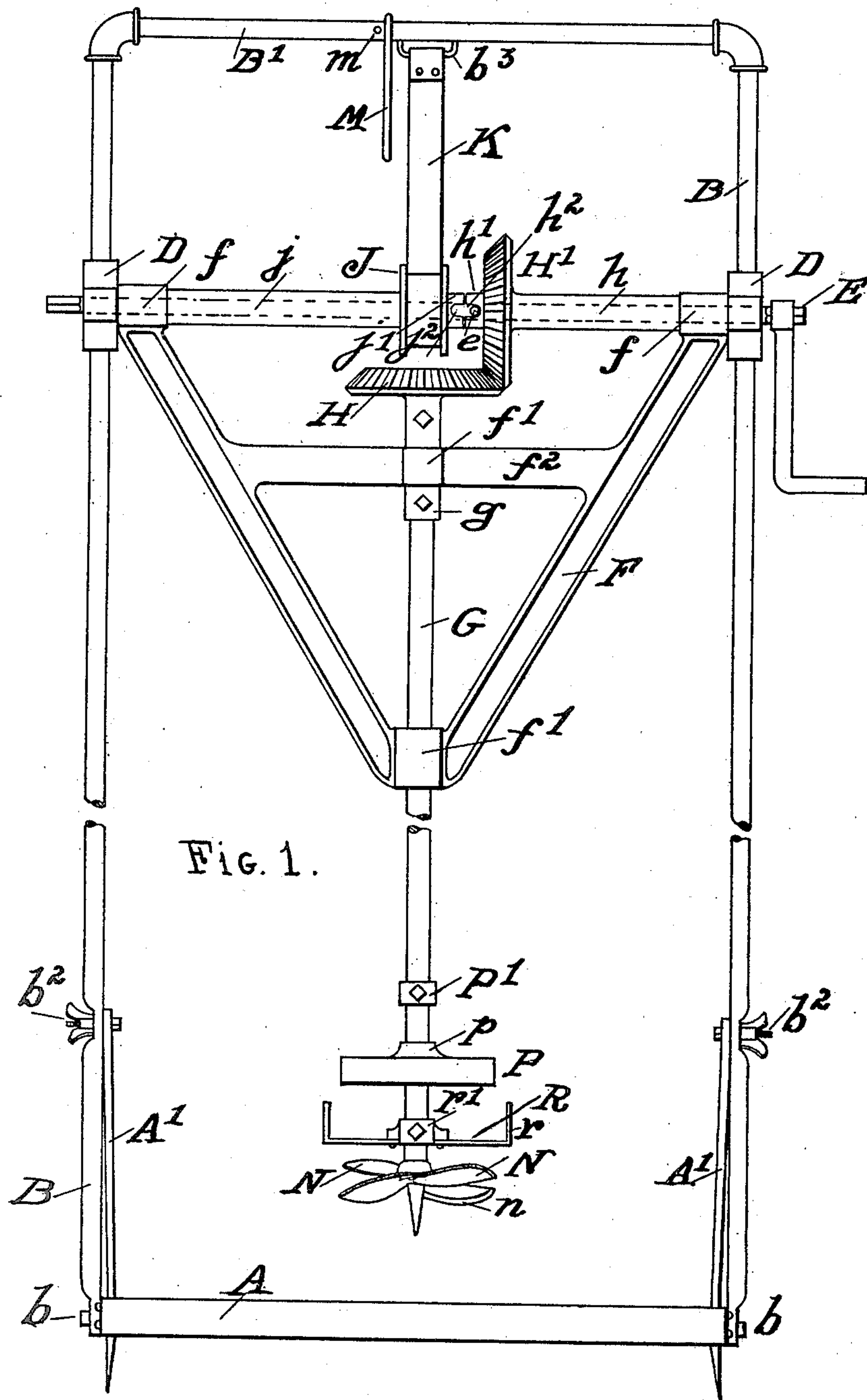


Fig. 1.

WITNESSES

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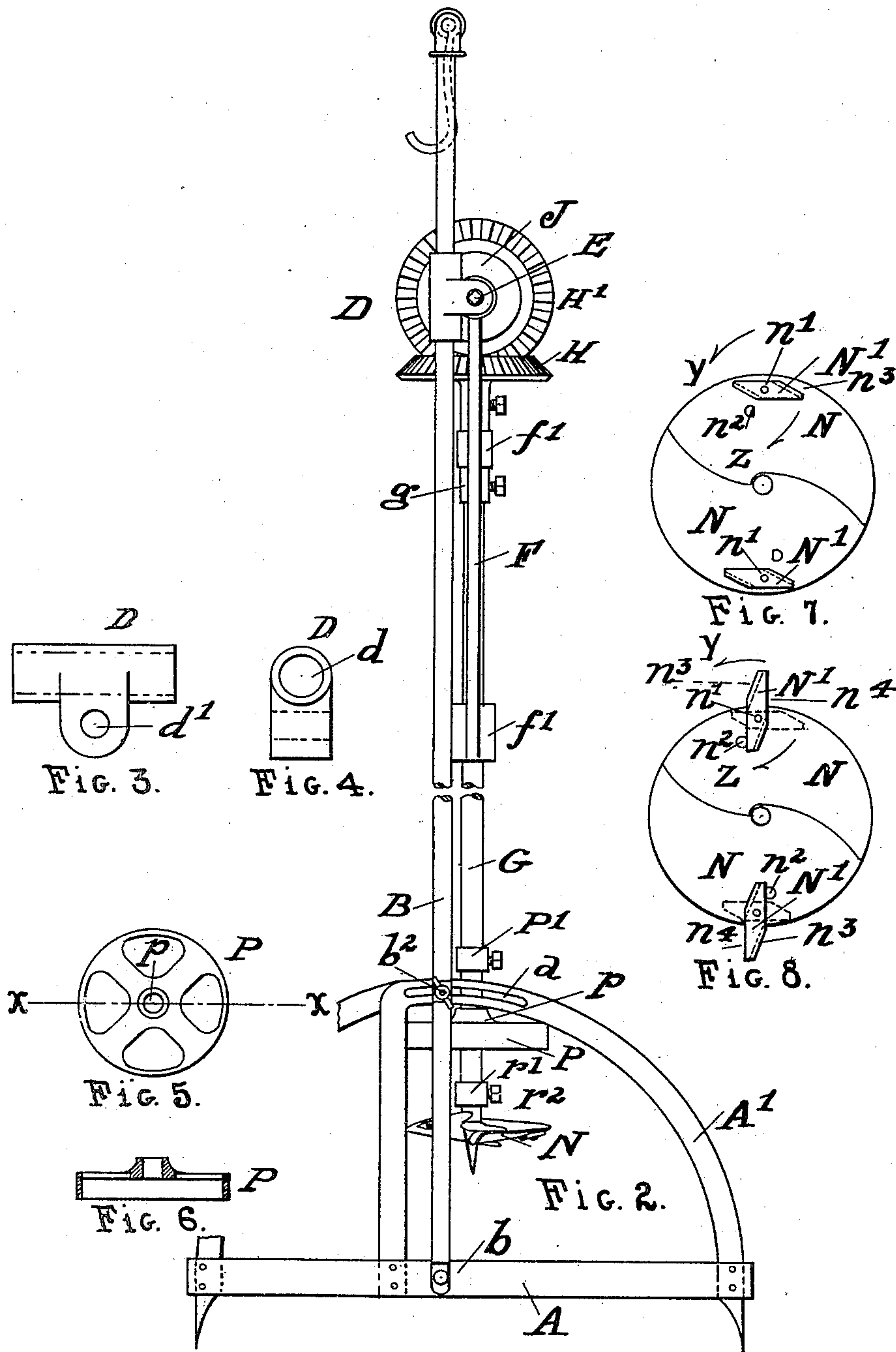
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WITNESSES

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UNITED STATES PATENT OFFICE.

RICHARD L. LEAVERTON, OF SPRINGFIELD, ILLINOIS.

POST-HOLE DIGGER.

SPECIFICATION forming part of Letters Patent No. 693,801, dated February 18, 1902.

Application filed April 27, 1901. Serial No. 57,828. (No model.)

To all whom it may concern:

Be it known that I, RICHARD L. LEAVERTON, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Post-Hole Diggers, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use my said invention.

My invention relates to post-hole diggers of that class which employs a rotating auger mounted on a suitable frame and means for rotating said auger.

The purposes of my invention are to provide a frame of novel and improved construction combining strength with lightness and portability and so constructed and arranged that the auger may be placed close to a standing fence in a convenient position for boring holes to receive posts to be used in repairing the fence without removing any of the boards of the fence, to provide means for convenient adjustment of the auger-supporting frame, so that the auger will bore vertically when the frame stands on sloping ground, to provide simple and effective means for compacting and retaining the dirt above the auger, so that it will not fall off when the auger is withdrawn from the hole, to provide means of novel and improved construction for lifting the auger-frame and the auger carried thereon, to provide improved means for holding the auger-frame in its raised position, to provide in connection with the auger a reversible and extensible bit of novel and improved construction, and to provide improved means for enlarging the hole made by the auger.

With these purposes in view my invention consists of the novel features of construction and combinations of parts shown in the annexed drawings, to which reference is hereby made and hereinafter particularly described and finally recited in the claim.

Referring to the drawings, Figure 1 is a front elevation of the complete apparatus. Fig. 2 is a side elevation of the complete apparatus. Figs. 3 and 4 are respectively a side elevation and top plan of one of the boxes in which the crank-shaft turns. Fig. 5 is a top plan of the compacter. Fig. 6 is a vertical

section on the line X X of Fig. 5. Fig. 7 is an enlarged plan of the auger as viewed from below and shows the extensible bits on the under side of the auger in the position which they occupy when not used in cutting. Fig. 8 is an enlarged plan of the auger as viewed from below and shows the extensible bits on the under side of the auger extended in position for cutting.

Similar letters of reference designate like parts in all of the views.

The base A is rectangular in form and is preferably made of wrought-iron. Side pieces B are pivotally connected at their lower extremities with the frame A by bolts b , passing through the side pieces and through the bars of the frame. The side pieces B are connected at their upper ends by a cross-piece B'. The side pieces B and the cross-piece B' are preferably made of gas-pipe and are connected by elbows B², as shown. Two arch-shaped braces A' are secured to the frame A and are pierced by segmental slots A, adapted to receive adjusting-bolts b^2 , passing through the pieces B and the braces A'. One of the braces A' extends entirely across the frame A and the other extends only part way across the frame. In the drawings I have shown the brace on the left-hand side of the machine as extending part way across the frame. The purpose in making one of the braces shorter than the other is that the corner of the frame contiguous to the short brace may be slid under the bottom board of a standing fence, so as to bring the auger-stem close to the fence, so that the auger may bore the hole in such position that the boards already on the standing fence may be nailed to the post placed in the hole. This feature is of great practical advantage in the repairing of old fences on account of the facility with which the machine may be set to bore the holes in proper position without necessity for any of the boards of the fence. By reason of the pivotal connection of the pieces B with the frame A the pieces B may be so adjusted relative to the frame A that the pieces will stand perpendicularly when the frame is inclined, as I will now explain. When the frame is set on inclined ground, the nuts b^2 may be loosened and the side pieces B may be

turned on the pivots *b* until they assume a vertical position. The nuts may then be tightened to hold them in that position.

The boxes *D* are preferably of the form 5 shown in Figs. 3 and 4 and are pierced by vertical holes *d* and transverse holes *d'*. The pieces *B* fit loosely in the holes *d*, so as to permit the boxes to slide on the pieces *B*. A crank-shaft *E* extends through both of the 10 boxes when they are in position on the piece *B*, and the shaft turns in the holes *d'* in the boxes. The crank-shaft *E* may have a crank at one end or may have a crank at both ends, as may be most convenient. The auger- 15 frame *F* is mounted on the shaft *E* and has at its upper extremity hubs *f*, in which the shaft turns freely. The auger-shaft *G* turns in suitable bearings *f'* on the frame *F*. A collar *g*, secured to the shaft, abuts against 20 the cross-piece *f²* of the frame *F* and prevents upward movement of the shaft on the frame. The bevel cog-wheel *H* is secured at the upper end of the shaft *G* and meshes with a cog-wheel *H'*, mounted on the shaft *E*. The 25 cog-wheel *H'* has an elongated hub *h*, which abuts against one of the hubs *f* on the frame *F*. It also has a hub *h'*, crossed by a transverse notch *h²*. A flanged wheel *J* is mounted on the crank-shaft *E* and has on one side an 30 elongated hub *j*, abutting against one of the hubs *f* and has on the other side a hub *j'*, crossed by a transverse notch *j²*. The wheels *H'* and *J* and their hubs occupy the entire space between the hubs *f*. A pin *e* passes 35 transversely through the shaft *E* and engages in the notches *h²* and *j²* in the hubs of the wheels *H'* and *J*. A strap *K* has its upper end secured to the cross-piece *B'* by means of a staple *b³*, and its lower end is riveted on the 40 perimeter of the flanged wheel *J*. When the shaft *E* is slid to the left to bring the pin *e* in engagement with the notch *j²*, if the shaft be rotated in the same direction that it rotates during the operation of boring, the strap will 45 wind around the flanged wheel *J*, so as to raise the frame *F* in an obvious manner. While this is being done the shaft *E* will turn within the hub of the wheel *H'* and the wheel will remain at rest. If the shaft *E* be 50 slid to the right, so as to bring the pin *e* in engagement with the notches *h²*, the wheel *H'* will become stationary on the shaft and will turn therewith and will mesh with and turn the wheel *H*, so as to cause the rotation of 55 the auger-shaft *G*. When the parts are in this relation, the flanged wheel *J* remains at rest and the shaft *E* turns within the hub of the wheel. A hook *M* is mounted to oscillate on the cross-piece *B'*. A pin *m* passes through 60 the cross-piece and prevents longitudinal movement of the hook on the cross-piece in one direction and the staple *b³* prevents movement of the hook in the opposite direction. The lower part of the hook curves rearwardly, 65 so that when the auger-frame is raised in ordinary use the hub *j* will push the hook rearward out of the way of the ascending frame.

When it is desired to support the auger-frame in its raised position, the hook may be 70 turned on the cross-piece *B'* to bring its point to the front in such position that when the auger-frame is raised the hub *j* will engage with and swing the hook rearwardly far enough for the point of the hook to pass under the hub, and the hook will then gravitate 75 under the hub in position to automatically engage with the hub, so as to support the frame in its raised position. It will be seen then that the action of the hook may be automatic or not, as may be most convenient in 80 practice.

The auger consists of two concavo-convex blades *N*, suitably secured to the auger-shaft *G* and having cutting edges *n*. Bits *N* are 85 mounted on the under side of the blades and turn on pivots *n'*. Rivets *n²*, having downwardly-projecting rounded heads, are secured on the blades *N*. Each of the knives *N'* has two cutting edges *n³* and two square 90 edges *n⁴*. The heads of the rivets *n²* are partially cut away, so as to form shoulders, against which the flat edges *n⁴* of the bits *N'* strike when the bits are turned in the direction indicated by arrows *Z*, and the shoulders 95 limit the movement of the bits and hold the knives in position for cutting. When the bits are turned in the direction indicated by arrows *Y*, the beveled edges of the bits ride on the convex surface of the rivet-heads and 100 spring the bits, so as to permit them to pass over the rivet-heads. The holes through the bits *N'*, in which the rivets *n'* fit, are to one side of the center of the bits measured longitudinally. Hence each bit practically has 105 two blades, one blade being longer than the other. By setting the bits *N'* with the long blade of each bit projecting beyond the perimeter of the auger-knives *N*, as shown in Fig. 8, a hole considerably larger than that 110 normally cut by the auger may be made. If the bits *N'* be turned so as to cause the shorter blades of the bits to project beyond the perimeter of the knives *N*, a somewhat-smaller hole will be made, and if the bits *N'* be turned to lie in the position shown in Fig. 115 7 they will be inoperative. By reason of the extensible and reversible bits *N* being mounted on the curved surfaces of the knives *N* the outwardly-projecting ends of the bits *N'* incline somewhat upward and tend to draw 120 the earth cut by them toward the center of the auger and contribute to the compacting of the dirt on the auger, as hereinafter explained.

It is desirable to compact above the auger 125 the earth cut thereby, so that when the auger is withdrawn the core of earth carried on the auger may be lifted out in a body and may not shatter and fall back into the hole, but may be swung out and deposited at a convenient 130 distance away from the hole. This result I attain by means which I will now describe.

The compacter *P* is cylindrical in form, and

its internal diameter is equal to the external diameter of the auger N, and it has a central hub *p*, which is slidable on the shaft G. A collar P' surrounds the shaft G and is adjustable vertically thereon by means of a set-screw, which may be tightened to clamp the collar in any desired position on the shaft. In practice the collar P' is set at a distance above the compacter slightly less than the depth of the core desired to be cut by the auger and raised at one time. The auger is turned to cut to the desired depth, thereby causing the hub *p* of the compacter P to abut against the collar P'. A few additional turns are then given to the auger, causing it to cut some more dirt and compact it in the core sufficiently to give the entire core such compactness that when the auger is lifted out of the hole the core will retain its form. This feature is of particular advantage in loose soil in which the earth has not sufficient tenacity to form a self-sustaining core without compression of the dirt of the core.

In practice it is found desirable to sometimes enlarge a hole after it has been bored. To accomplish this result, I provide a reamer R, extending somewhat beyond the perimeter of the auger and having vertical cutting edges *r* and also having a hub *r'*, fitting around the shaft G and adjustable thereon by means of a set-screw *r*². In the drawings I have shown the reamer in position between the auger and the compacter. When not in use, the reamer may preferably be detached. It may, however, remain on the auger-shaft without interfering with the operation of the compacter.

I am aware of the patent to Davis, No. 565,609, "Post-hole digger," dated December

14, 1897. I therefore do not claim the features of construction shown therein, but restrict my claims to the modifications and improvements herein disclosed, whereby I attain superior lightness and simplicity of construction of the frame without sacrifice of stability, the superior means for engaging and disengaging the auger-lifting device, the means whereby the frame is made adjustable, so that the auger will bore a vertical hole when the frame stands on sloping ground, the improved construction of the frame adapting the machine to be set so as to bore close to a standing fence, and the extensible and reversible bits usable with the auger.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a post-hole auger, the combination of an auger-shaft, concavo-convex blades secured on said shaft, bits pivoted to turn on the under side of said auger-blades, each of said bits having two beveled blades of different lengths, and stops on the underside of said concavo-convex blades adapted to permit the turning of said beveled blades in one direction and serving to prevent the turning of said beveled blades in the opposite direction, as set forth.

In witness that I claim the foregoing as my invention I have hereunto subscribed my name, at Springfield, Sangamon county, Illinois, this 17th day of January, 1901.

RICHARD L. LEAVERTON.

Witnesses:

FRANK G. LISTER,
ANNIE A. DAY.