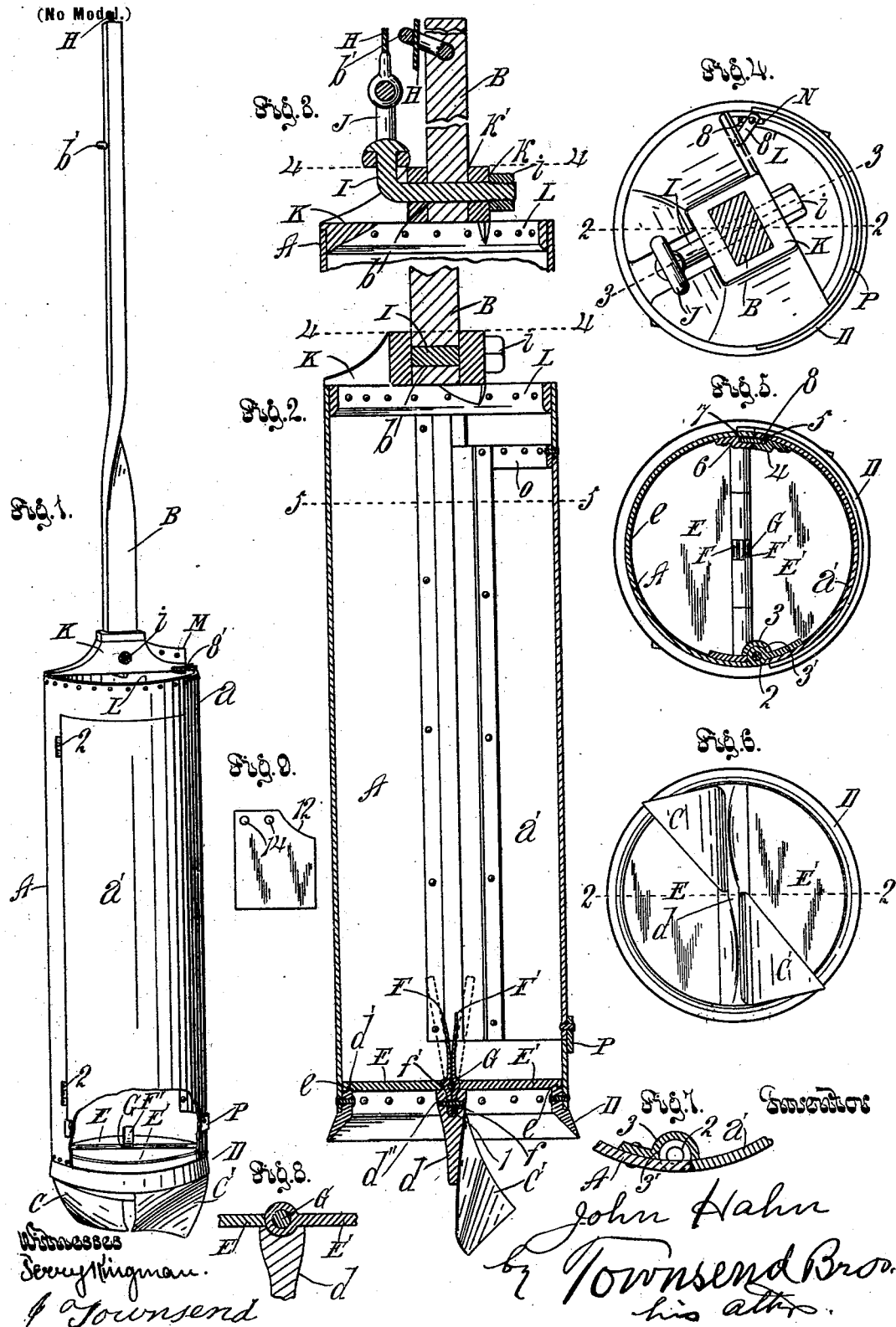


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Patented Apr. 3, 1900.

J. HAHN.
WELL AUGER.

(Application filed Feb. 25, 1899.)



UNITED STATES PATENT OFFICE.

JOHN HAHN, OF COLEGROVE, CALIFORNIA.

WELL-AUGER.

SPECIFICATION forming part of Letters Patent No. 646,538, dated April 3, 1900.

Application filed February 25, 1899. Serial No. 706,881. (No model.)

To all whom it may concern:

Be it known that I, JOHN HAHN, a subject of the Emperor of Germany, (having declared my intention of becoming a citizen of the United States,) residing at Colegrove, in the county of Los Angeles and State of California, have invented a new and useful Well-Auger, of which the following is a specification.

My invention is especially designed for boring in quicksand, but is applicable for all kinds of earth and soft stone.

An object of my invention is to provide a well-auger by means of which the well can be sunk through a stratum of quicksand and the quicksand removed upward through the well-casing after the casing has been sunk through such stratum.

My invention also includes a construction for use in connection with a reamer for reaming out an uncased hole in the solid earth.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective view of an auger embodying my invention. Fragments are broken away to expose interior construction. Fig. 2 is a vertical mid-sectional view of the auger on line 2 2, Figs. 4, 5, and 6. Fig. 3 is a fragmental section on line 3 3, Fig. 4. Fig. 4 is a plan section on line 4 4, Figs. 2 and 3. Fig. 5 is a plan on line 5 5, Fig. 2. Fig. 6 is a plan of the bottom of the auger. Fig. 7 is a fragmental sectional detail of the door and barrel below the hinge. Fig. 8 is a fragmental sectional detail of the valve-hinge. Fig. 9 is a plan of the blade-blank.

A indicates the cylindrical barrel of the auger, provided with a door-opening *a* and having a door *a'*, which is made water-tight by means of the construction hereinafter particularly described.

B indicates the shank of the auger, and C C' two bits or boring-blades, which are fastened below the shoe D of the auger to a cross-bar *d*, which extends across the extended axis of the auger from side to side of the shoe D.

E E' indicate two clap-valves hinged to the cross-bar *d* and arranged to fit upon the top of the shoe.

e indicates grooves on the under side of the valves, respectively, to fit upon an annular tongue *d'*, which projects upward from the top of the shoe at the inner side thereof.

F F' indicate two stop-springs which extend upward from the hinge of the valves E E' to prevent such valves from being thrown too far up. The springs prevent the valves from being thrown beyond the center. The springs F F' are preferably formed of a single piece bent in the middle to form a shank *f*, which is inserted in a socket *l* in the cross-bar *d*, and above such socket the springs are curved to form a retaining-seat *f'* for the bolt G, which forms the pintle of the hinge for the valves E and E'.

d'' indicates a bolt or screw inserted through the shank *f* and cross-bar *d* to hold the shank and the attached valves in place. When the screw *d''* is removed, the springs and the valves E E' can be taken out.

The blades C and C' are curved, and in practical operation when the auger is turned to bore into the earth the earth is loosened by the blades and enters the barrel A through the shoe D, raising the doors or valves E E'.

H indicates a rope for raising and lowering the auger.

I indicates a swivel-bolt to which a swivel J is swiveled, and the rope H is fastened thereto. The head K of the barrel is provided with a hole *k*, through which the swivel-bolt I is passed.

k' is a socket in the head K for the shank B. *b* is a hole through the shank B to receive the bolt I. The bolt I is passed through the holes *k k'*, thus serving to hold the shank in place, as well as to hold the swivel J.

i indicates a nut which secures the bolt I in place.

b' indicates a ring in the shank B to hold the rope H close to the shank.

L indicates a hole through the head K of the barrel, and M indicates a blade which extends up at one side of the hole L. This blade is designed to throw the earth into the opening L when a reamer (not shown) is used above the barrel A for enlarging a hole.

The object of the door *a'* is to allow the material to be readily removed from the barrel.

2 indicates the hinges by which the door is hinged at one side to the barrel.

3 indicates a plate which extends from top to bottom of the opening in which the door *a'* fits. This plate is provided with a channel 3' to seat the joint and chamber the hinge.

It projects beyond the hinge-joint to engage with the inside face of the door, as at 3', thus to increase the strength and to prevent leakage. The free side of the door is provided on its inside with a strip 4, which is bent to leave a channel 5 between it and the edge of the door. 6 indicates a like strip fastened to the edge of the opening in which the door fits and bent to leave a channel 7 between its edge and the edge of the door-opening in the barrel. The channels 5 and 7 register with each other when the door is closed.

8 indicates a locking-bar which fits in the channels when they are closed. The bar 8 is inserted through a hole N, provided in the barrel-head for that purpose.

8' indicates a button on top of the bar to lock it in place.

The barrel A is made of plate-steel—say one-fourth inch thick, more or less—and is sufficiently strong to remain rigid under any strain to which it is put.

In practical operation the auger will be placed in position for boring, the door having been fastened shut by means of the bar 8, as shown in Fig. 5. Then the auger is turned by means of the shank B and the blades C C' cut into the earth and the loosened earth passes up through the shoe D, raising the valves E E' and passing into the barrel. The barrel may be of any desired length—say anywhere from three to ten feet, or more, if desired. The auger is sunk until the barrel is filled and is then withdrawn by means of the rope H. In passing through the quicksands the auger will be sunk until it has passed through the quicksand stratum, and the casing will then be forced down and the auger withdrawn through the casing. The contents will be retained by the valves and door. After the auger, with its contained earth, has been withdrawn from the well the bar 8 will be withdrawn from its seat, thus opening the door a' and allowing the material to be discharged.

In boring in ordinary earth the valves E E' will not be necessary, and they can be removed by unscrewing the screw d'' and then lifting the shank of the springs F F' from its socket in the cross-bar d.

The auger can be made of any diameter desired, from a half-foot or less to six feet or more.

The swivel being fastened to the head directly allows the auger to be lifted by rope H without bringing any strain upon the shank-fastening.

The shoe and its cross-bar are cast solid in one piece.

The blades are made of three-eighths-inch-thick plate-steel, and in Fig. 9 I have shown

the same before bending. The blade is rectangular, except that one corner is cut away, as at 12, to give the proper shape to the blade when bent and secured to the cross-bar by bolts (not shown) passed through holes 14.

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

1. In a well-auger, the combination with a cylindrical barrel provided at the top with a head and in its body with an opening for a door, and also provided with a door for closing said opening, and also with means for sealing the door and with valves at the bottom of the barrel; of a shoe fastened to the bottom of the barrel and with its bottom forming an annular cutting edge of greater diameter than the barrel and its top forming an annular shoulder inside the barrel to seat said valves.

2. The combination with a well-auger barrel, of a shoe fastened inside the lower end of the barrel and forming an annular shoulder inside the barrel, and an annular cutting edge below the barrel of greater diameter than the barrel, said shoe also being provided with a cross-bar having a socket therein; a spring bent upon itself to form a shank seated in the socket and projecting upward therefrom and bent outward and inward to form a hinge-pintle seat and bent outward above such hinge-pintle seat to form spring valve-stops; means for fastening the shank of the spring in the socket; a pintle in the pintle-seat; and valves hinged to the pintle.

3. The combination with the auger-barrel having an opening in the side, a channel being provided along one side of the opening, of a door hinged to the other side of the opening and provided at its free edge with a channel to register with the channel of the barrel; and a bar in the said channels to seal the door.

4. The combination with the well-auger barrel having a door-opening in one side; of a door hinged to the barrel to close the opening; means for fastening the door; and a channel-strip fastened to the wall of the barrel and chambering the hinges of the door and extending over the joint between the door and the barrel.

5. The combination with the well-auger barrel; of a shoe provided at the top around its inner edge with an upwardly-projecting annular tongue; a cross-bar extending across the shoe; and valves hinged to the cross-bar and provided with grooves to fit said tongue.

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Witnesses:

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