(No Model.)

G. D. PETTINGILL.

EARTH AUGER AND LIFTING AND LOWERING DEVICE FOR WELL CURBING.

No. 270,472. Patented Jan. 9, 1883.

Fig. 1.

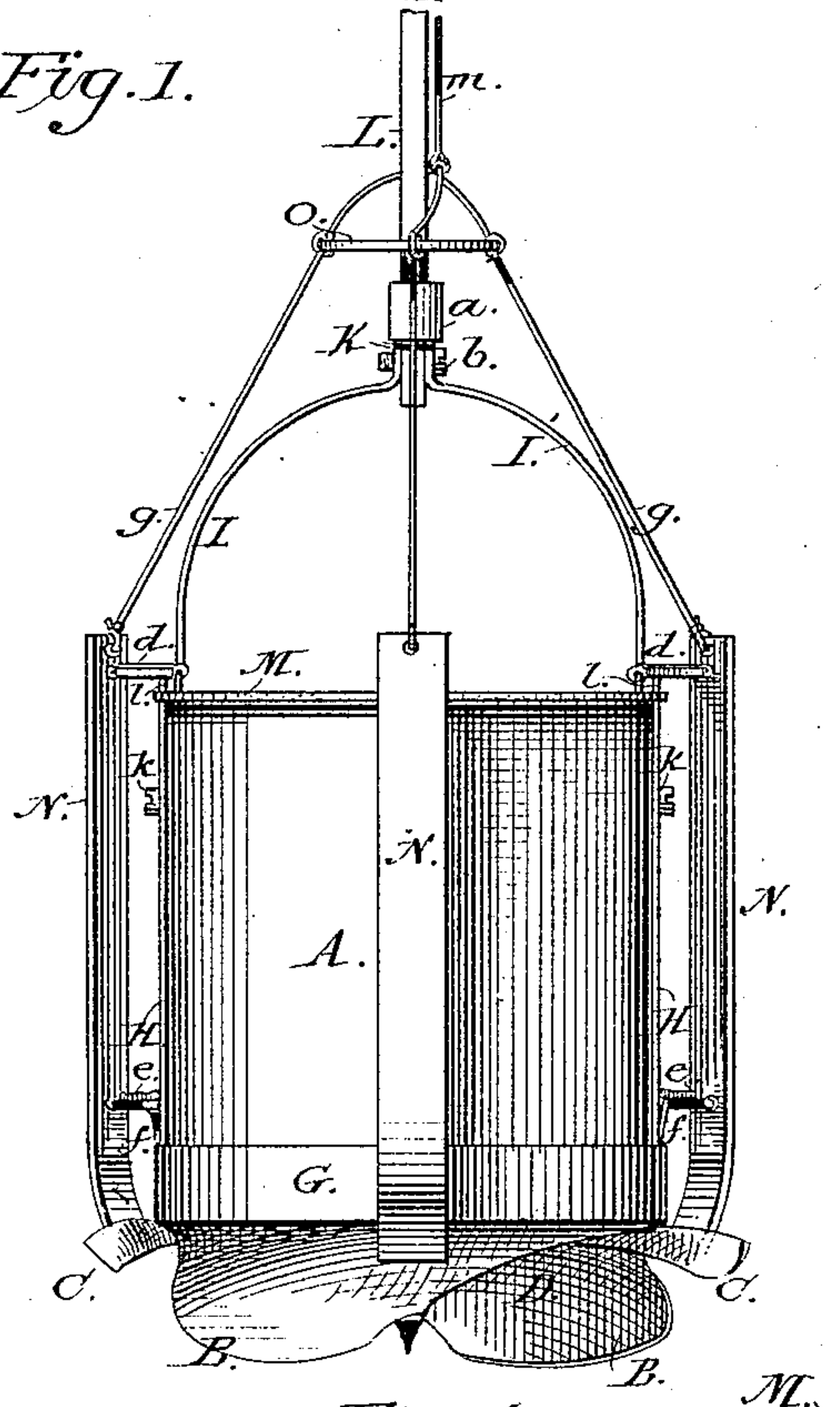


Fig. 2.

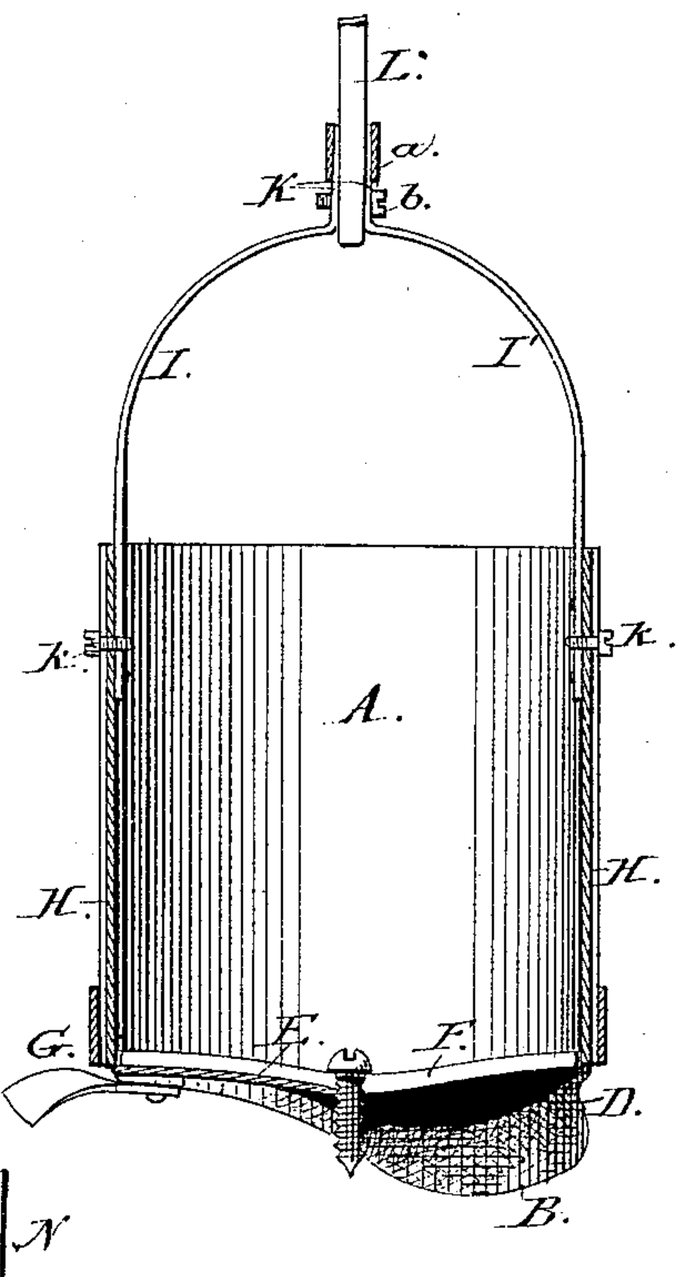


Fig. 4.

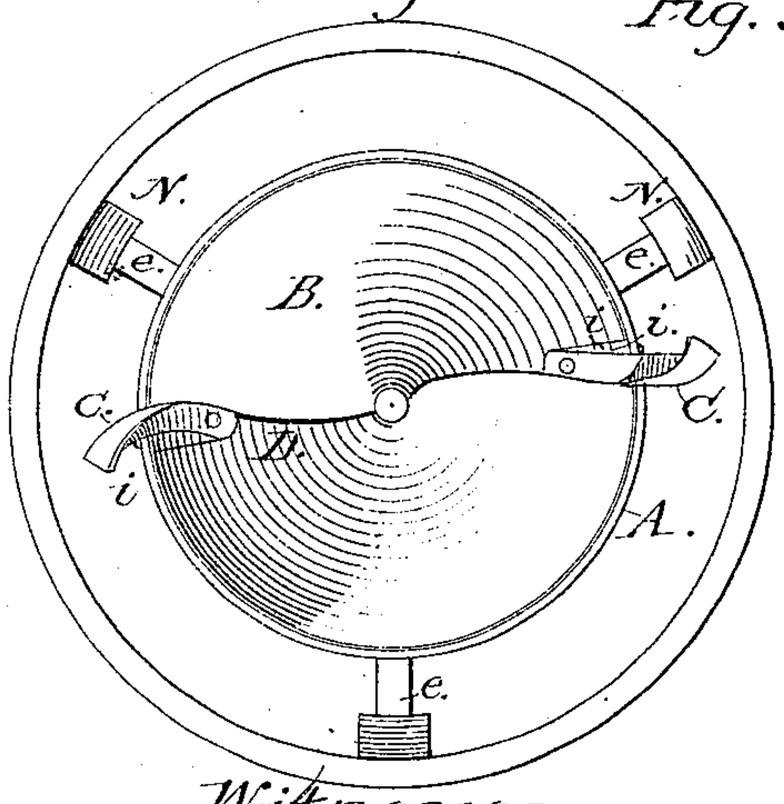


Fig. 5.

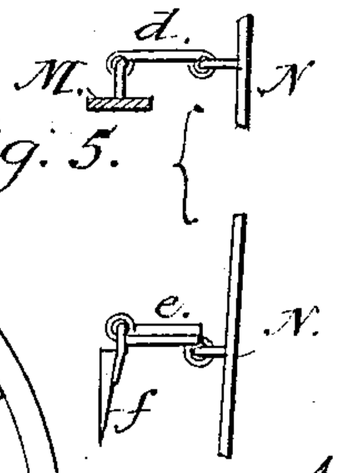
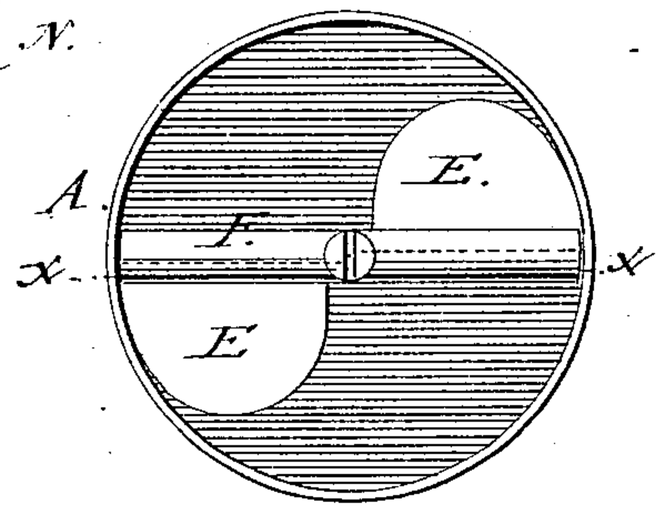


Fig. 3.



Witnesses:

F. M. Kalb

Edw. W. Dunn Jr.

Inventor:

George D. Pettingill

per Edw. W. Dunn

Atty.

UNITED STATES PATENT OFFICE.

GEORGE D. PETTINGILL, OF ASBURY PARK, NEW JERSEY.

EARTH-AUGER AND LIFTING AND LOWERING DEVICE FOR WELL-CURBING.

SPECIFICATION forming part of Letters Patent No. 270,472, dated January 9, 1883.

Application filed August 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. PETTINGILL, of Asbury Park, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in Earth-Augers and Lifting and Lowering Devices for Curbing of Wells; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention is an improvement in earth-augers to be used in excavating wells, and in certain devices connected therewith to facilitate boring, and also in an attachment by which well-curbing may be lowered into a well and placed in position section by section.

It consists, first, of a bucket earth-auger formed with a spirally-warped bottom, and provided with pivoted auxiliary claws or cutters which may be thrown automatically into position for work or withdrawn automatically; and also, in connection with the foregoing, of two adjustable valves fixed upon a bar, by which they may be readily applied or detached, together, all of which will be fully set forth hereinafter.

It consists, secondly, of a device for lowering curbing, which device is connected to the auger in a manner as will be hereinafter described.

In my drawings, Figure 1 is an elevation showing the auger-bucket and device for lowering the curbing. Fig. 2 is a transverse vertical section of the same on line *x x*, Fig. 3. Fig. 3 is a detail view, showing detachable valves. Fig. 4 is a plan or view of the bottom of the auger-bucket. Fig. 5 is a sectional view, showing how N is secured to M and *f*.

Similar reference-letters indicate like parts in all of the figures.

Referring to drawings, A is the bucket, formed of metal or other suitable material, to the bottom of which is permanently secured, by brazing, riveting, or other mechanical means, the bottom or borer B. This auger or borer is formed preferably of a single piece of metal, warped by hammering or in casting, so as to form two opposite surfaces that may present the appearance of spiral curves with opposite openings, D D. To the opposite sides of the bucket, on the outside, are secured by screws *k* two upright strips, H, to the bottom of which is fastened an annular band, G, which fits loosely over the base of the said bucket. Angle-strips *i i* (see Fig. 4) are riveted or brazed to the inner side of the band G, and to said strips are pivoted auxiliary cutters or claws C C. These claws are adjustable, and when in place rest snugly against the bottom of the auger and immediately in front of the openings D D. While boring in soft or yielding soil they may be detached, with the band G, by drawing the screws *k k*.

E E are valves, formed of rubber packing or other suitable flexible material, securely riveted to a bar, F, which latter may be secured by a screw at the axis or intersections of the warped surfaces of the auger. These valves are used when boring in quicksand or semi-liquid substances, frequently met with when approaching a water-supply.

To the bucket A is permanently secured a bail composed of two bows, I I′, which form at their free ends a clevis, K, to receive a shaft, L, pivoted to said bail by a screw, *b*. A keeper or sliding loop, *a*, fits snugly over the bail, clevis, and bar L, to hold the latter to the true axial line of the auger. The shaft L may be of any desired length and formed in sections, if necessary. At the upper end of this bar, at the surface of the ground, may be applied the usual mechanism employed in driving and lifting the auger and bucket.

M is a flat, ring about the diameter of the bucket A, notched to fit snugly over the bail of said bucket and rest on the upper edge of the latter. Limbs N are hinged to the said ring M by interposing arms A, hinged at each end. Short projecting lugs *l* rise from the upper surface of the ring M to serve as bearings to the arms *d* and prevent the limbs N from dropping down. The limbs N extend downward toward the bottom of the bucket, and are curved inward at their lower extremities. Arms *e* are hinged to said limbs, which in turn are hinged to short wedge-shaped pieces *f*, adapted to be tucked into the space between the outer surface of the bucket A and the in-

ner surface of the band G. To the upper ends of the limbs N are connected cords or chains *g*, which converge toward a flat ring, O, which encircles the shaft L. Small holes formed in this ring serve as fastenings for said cords or chains, which extend above and are united to a single cord or chain, *m*, which reaches up above the surface of the ground and within easy reach of the operator.

The device just described is intended for use in lowering sections of curbing into place in the well, as the work of boring progresses, in the following manner: The cord or chain being drawn upward raises ring M, and the limbs N, rising by turning the hinges of arms *d* and *e*, are brought snug to the bucket and the said bucket is dropped within the inner space of a section of the curbing. The chain *m* is now released to allow the limbs N to expand into a cylinder equal to the inner diameter of the curbing. The auger is now lifted, and with it the curbing. The main surface of the latter, as its weight settles, impinges upon the said limbs and forms its own hold by friction caused by gravitation. The curbing may now be lowered to place in the well and released, when fitted upon its seat, by simply withdrawing again the cord or chain *m*. While the auger is making its way into the earth to form the well it is relieved of trappings which form the curb-lowering device, and, except when boring into very hard or tough earth, it is also relieved of the claws C. When, however, said claws are needed they may be readily applied, as previously mentioned, and as soon as the auger begins to revolve about its axis and cut into the ground the said claws will be forced outwardly, limited by their respective pivots, until they stand outside of the auger-cylinder, and in this position they materially assist in undermining and disintegrating the earth beneath the already lowered curbing. By reversing the movement of the auger the claws, by reason of their contact with the surroundings and their limiting centers of motion, will be forced inward toward the axis of the auger and under the latter. When the bucket of the auger is full it is drawn to the surface of the ground and dumped by drawing the keeper or slide *a* off from the clevis to allow the said bucket, with its bail, to swing laterally and empty itself.

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

1. The flexible valves E, fixed to the bar F, attachable to or detachable from the bucket's bottom by means of a suitable screw, as and for the purpose set forth.

2. The combination of the attachable or detachable flexible valves, composed of parts E and F, with the buckets A, substantially as specified.

3. The claws or auxiliary cutters C, in combination with the auger-bucket and the detachable band surrounding the bottom of same, substantially as set forth.

4. The combination, with the auger-bucket, of the device for lowering the curbing, composed of limbs N, ring M, and wedges *f*, and hinge-connections, as and for the purpose set forth.

5. The combination, with the auger-bucket, of the mechanism for supporting and placing the curbing, and cords or chains and ring O, for manipulating the latter, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

GEORGE D. PETTINGILL.

Witnesses:
ALFRED D. BAILEY,
THOMAS C. MOORE.