(No Model.) 2 Sheets—Sheet 1.

T. DOUGHERTY.

EXCAVATING APPARATUS.

No. 283,703. Patented Aug. 21, 1883.

Fig. 1.

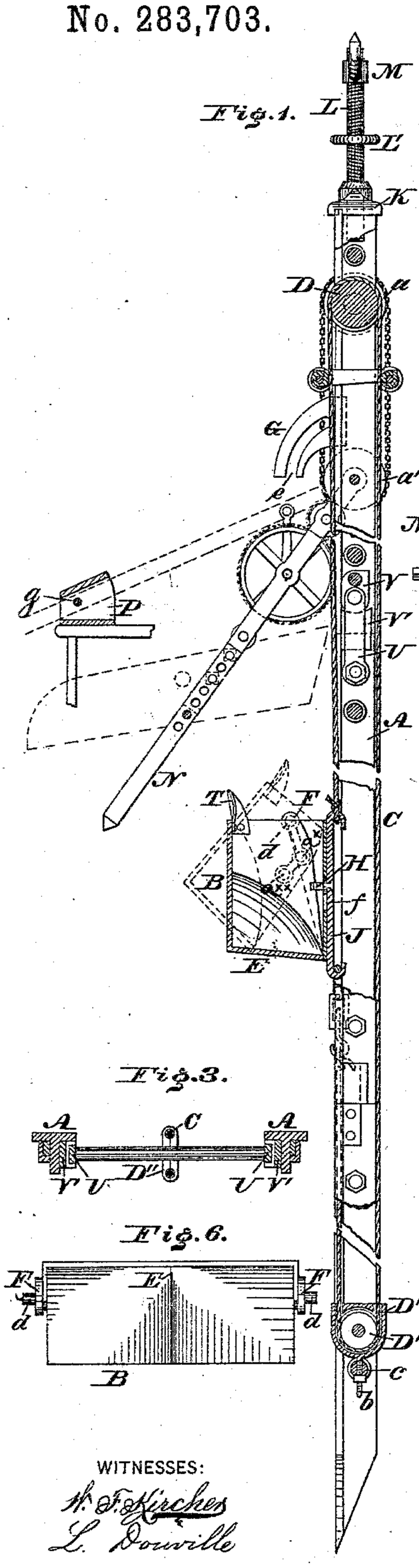

Fig. 2.

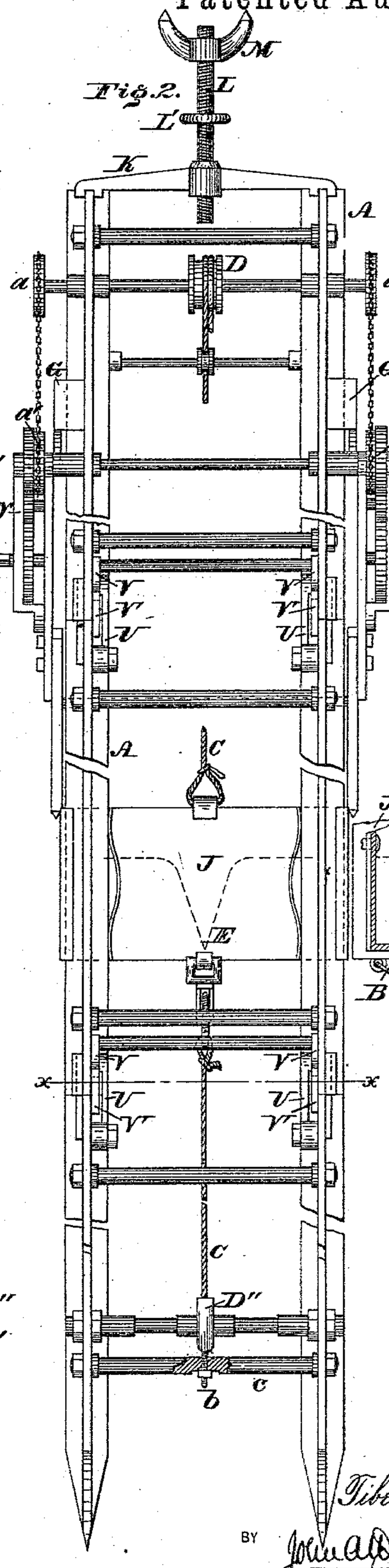

Fig. 4.

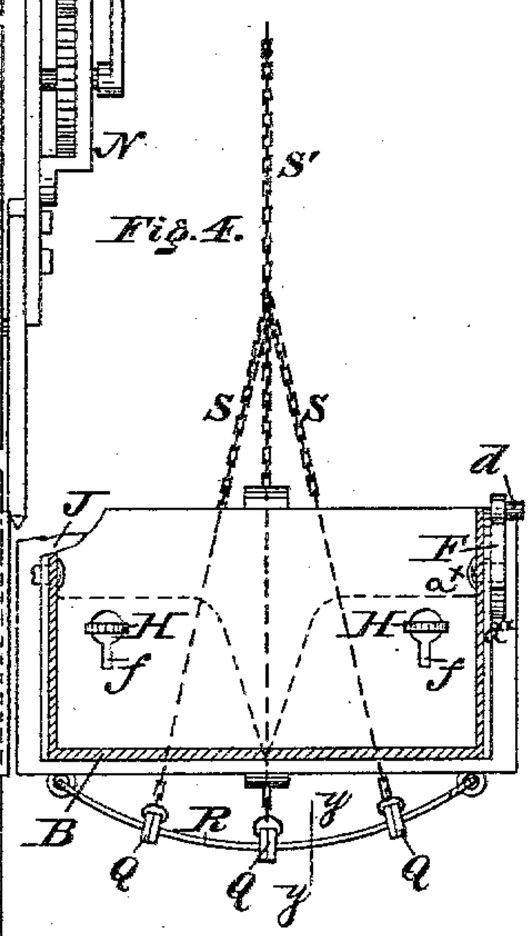

Fig. 3.

Fig. 5.

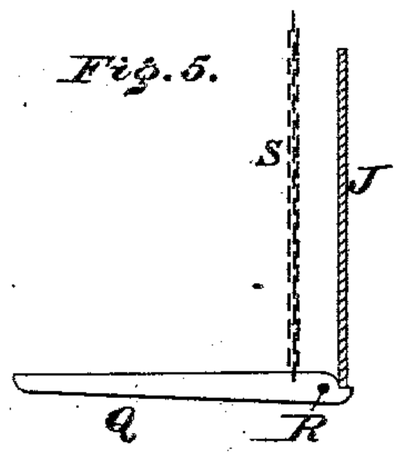

Fig. 6.

WITNESSES:

W. F. Kirches

L. Douville

INVENTOR:

Tiberius Dougherty,

BY John A. Wiedersheim ATTORNEY.

(No Model.) 2 Sheets—Sheet 2.

T. DOUGHERTY.

EXCAVATING APPARATUS.

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Fig. 7.

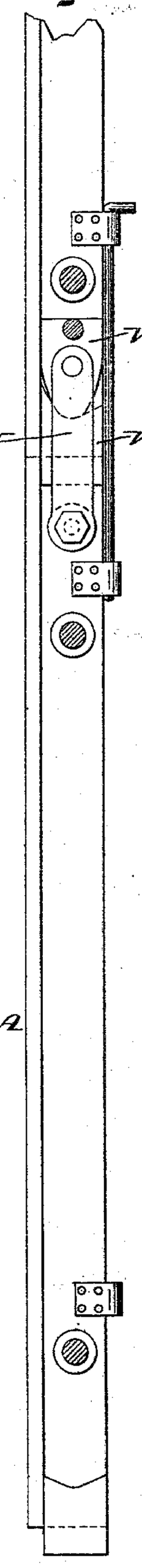


Fig. 8.

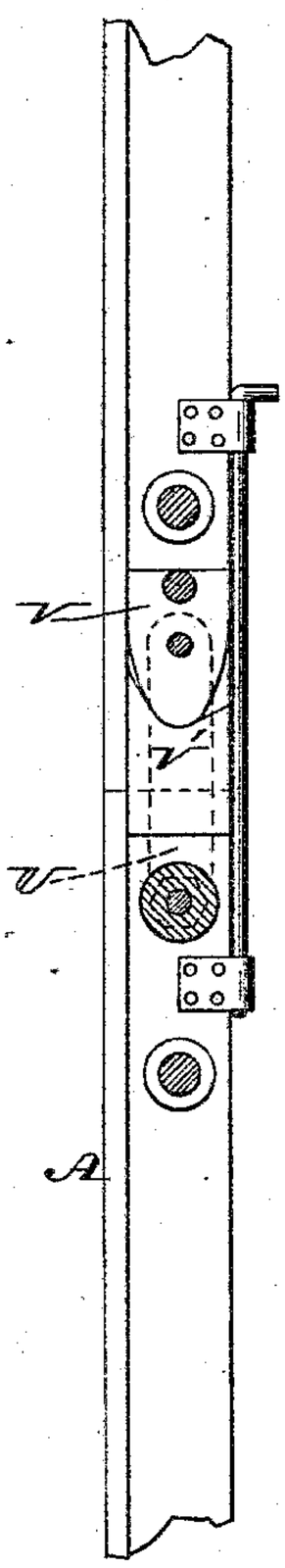
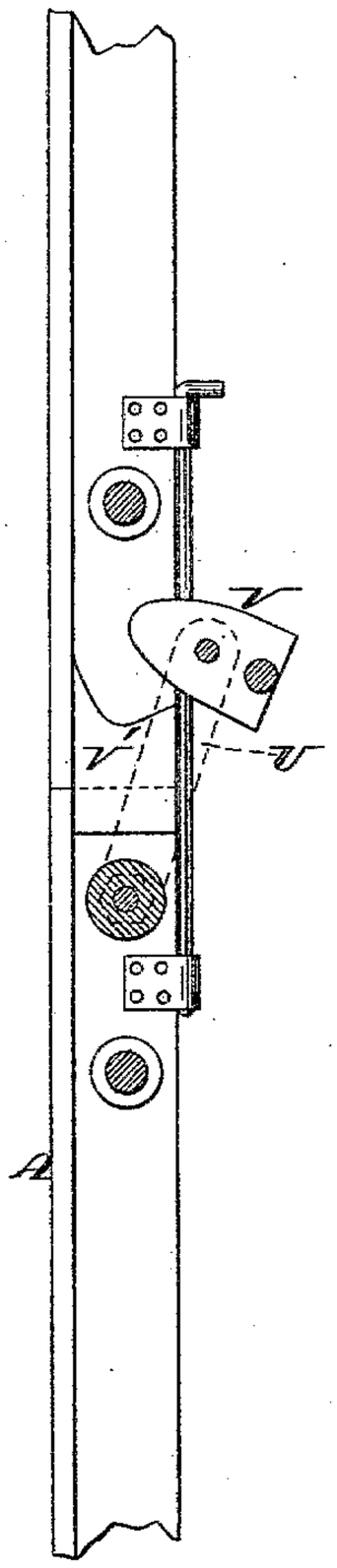


Fig. 9.



WITNESSES:

Ellwood S Linn

W. D. Kircher

INVENTOR:

Tiberius Dougherty,

BY John A Diedersheim

ATTORNEY.

UNITED STATES PATENT OFFICE.

TIBERIAS DOUGHERTY, OF PHILADELPHIA, PENNSYLVANIA.

EXCAVATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 283,703, dated August 21, 1883.

Application filed April 28, 1883. (No model.)

To all whom it may concern:

Be it known that I, TIBERIAS DOUGHERTY, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Excavating Apparatus, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a partial side elevation and partial vertical section of an excavating apparatus embodying my invention. Fig. 2 is a rear view thereof. Fig. 3 is a horizontal section in line *x x*, Fig. 2. Fig. 4 is a view of a detached portion, partly sectional. Fig. 5 is a section of a portion thereof in line *y y*, Fig. 4. Fig. 6 is a bottom view of the bucket of the apparatus. Figs. 7, 8, and 9 are views of detached parts of the frame and the fastenings thereof, enlarged, and portions thereof in section.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of an apparatus for excavating or cleaning wells or cesspools, the same being strong and durable, reliable in operation, and easily set up and taken down, as will be hereinafter fully set forth.

Referring to the drawings, A represents an upright frame, which is formed in sections, whereby it may be lengthened or shortened, as desired.

B represents a bucket or conveyer, which is guided on the frame A, and has connected with it an operating chain or rope, C, which is passed around sprocket wheels or pulleys D D′ at the top and bottom of the frame, whereby the bucket may be raised and lowered, the shaft of the top puiley, D, carrying sprocket-wheels or pulleys *a*, which, by means of chains or belts and other suitable wheels or pulleys, *a′*, and gearing, may be readily rotated, so as to impart motion to the rope C, either shaft of the gearing being adapted for attachment of a crank-handle or hand-wheel.

The pulley D′ is inclosed by a casing, D″, which guards said pulley and prevents entrance of matter or dirt thereto without interfering with the passage of the rope C, said casing being loosely fitted on the shaft of the pulley D′, and retained in position by means of a bolt, *b*, which is passed through a round, *c*, at the bottom of the frame A, and secured by a nut, *b′*.

The bucket is formed of two parts hinged together above the center, so as to open below. The back part is flat, and the front part is somewhat of mold-board shape from the center to each side and toward the bottom, thus leaving at the center a peak, E, the bottom of which is sharp, and the sides taper toward the bottom, making a sharp bottom for the bucket, it being noticed that the peak extends at a right angle to the bottom edge of the bucket, and said edge is parallel with the frame A.

The sides of the back part of the bucket have pivoted to them, as at $a^{\times}$, elbow-levers F, the lower ends whereof are connected at a different point to the sides of the front part, as at $a^{\times}$ $a^{\times}$, and the upper ends have laterally-projecting gudgeons *d*, which are adapted to enter curved slots *e*, formed in projecting arms G, which are secured to the upper part of the frame A, the slots beginning at the bottoms of said arms and curving upwardly and inwardly, whereby, when the gudgeons enter said arms, they are drawn rearward or inward, and cause the elbow-levers to throw out the front part of the bucket, thus opening the bottom of the latter. In the present case each lever F and the adjacent sides of the two parts of the bucket have a common pivot.

In order to remove the bucket, I form in the back part thereof slots *f* to receive buttons or bolts H, which are rotatably connected with a plate, J, whose sides form guides which embrace the upright frame A, and the operating-rope C is connected with the top and bottom of said plate. The side pieces of the frame A are formed of angle or T iron, which vastly strengthens said pieces, and are also connected at intervals by rounds or cross-pieces, thus producing a strong structure.

K represents a cross-head, whose ends are bifurcated to straddle and be removably connected with the top of the frame A, and has in its center a threaded opening for the engagement of a screw, L, which is formed with an operating wheel or handle, L′, and has fitted to it at its upper end a nut, M, which is preferably formed with upwardly-extending wings, the points whereof are adapted to take

firm hold of the ceiling of the privy or outhouse to be cleansed, the operation of the screw L causing the nut to tighten against the ceiling, and, owing to the downward pressure of the cross-head, occasioned by the screw and resistance offered by the ceiling, the frame will be firmly held in position. The screw L is right-and-left threaded, one part entering the cross-head or bridge K and the other part entering the pointed nut M. The wheel or handle L′ is rigidly connected with the screw, and when said screw is rotated it moves the bridge and nut powerfully and rapidly in opposite directions.

N represents a frame, which is mounted on the axis of the wheels *a′* and carries gearing which meshes with said wheels, the axis of one of the gear-wheels of each side of the frame being squared for the attachment of a crank-handle, the side pieces of said frame, which form legs, being made of removable parts or adjustably-connected pieces, so as to be lengthened and shortened, and the lower ends thereof are pointed, so as to pierce the floor or seat of the privy, for securely sustaining the frame and connected parts of the device. For purposes of holding the frame N, under some circumstances I employ keepers or eyes P, which may be screwed to the risers of the privy-seat and have the legs or side pieces of the frame pass through them, the walls of the keepers being perforated for the passage of the bolts *g*, which connect the lengths of said legs or side pieces, whereby the legs and keepers may be firmly secured together. Where the mass within the well or cesspool is thick or stiff it is necessary to cut or break the same. For this purpose I employ cutters Q, which are pivoted to a rod, R, on the under side of the plate J, and have attached to them chains or ropes S, which are connected to a chain or rope, S′, common to all, said cutters being adapted to open out to a horizontal position, or folded upwardly to an upright position. In the latter position the cutters may be lowered into the mass, and when the plate J is raised the cutters are brought out to the horizontal position, and so present their edges to the mass and cut or break through the same. This may be repeated, the cutters being shifted on the rod R, so as to cut in different places, and when they have accomplished their purpose they are fully raised by the chain or rope S′, and so may be drawn through the opening in the floor or seat. In the use of the cutters the bucket is temporarily removed, and reapplied when the mass is in condition to be worked.

The rope or chain C is connected with the plate J by a screw-swivel, which readily permits the tightening of said rope as occasion requires.

The operation is as follows: The frame A is passed through an opening in the floor or seat of the privy and firmly secured in position by the devices hereinbefore stated, its lower end being pointed to take firm hold of the ground. Power is applied to the gearing, so as to operate the rope C and lower the bucket into the mass in the well or cesspool. Owing to the mold-board shape of the front part of the bucket, it is forced against the back part thereof by the pressure or resistance of the mass, and thus the bottom of the bucket is held closed, the same effect being occasioned as the bucket is raised. The bucket is now filled by the mass entering at the top, after which it is raised by the proper operation of the rope, and when the gudgeons *d* reach the slotted arms G the elbow-levers F force out the front part of the bucket, thus opening the bucket thereof and causing the discharge of its contents. The matters may be received in a barrel or other bucket, or may be directed into a hinged or tilting chute or spout, (shown in dotted lines, Fig. 1,) arranged to be thrown up to permit the passage of the bucket, and returning to its normal position when it receives the contents of the bucket.

Projecting upwardly from the outer end of the top of the bucket are spurs T, which are so disposed that when the bucket rises they will catch any articles of clothing, fabrics, &c., that may have been thrown into the well.

For the purpose of connecting the sections of the frame A, I pivot to the inner sides of one section arms U, to the outer end of which are pivoted lugs V, which extend along the sides of said arms, and have curved ends which are adapted to engage with curved depressions formed on the ends of lugs V′, which are secured to the inner sides of the other sections. By properly swinging around the arms U and bringing the lugs V against the lugs V′ and forcing them over the same they engage therewith with a snap and hold the contiguous ends of the sections of the frame firmly together. The lugs V′ overlap the joints of said contiguous ends and assist in preventing lateral displacement of the sections, and the sections are also interlocked by tongues and grooves or keepers, the tongues projecting from one section and entering the grooves or keepers of the other section, it being seen that by these several provisions the sections, when set up, are firmly connected as one.

The device may be readily taken apart, packed, and transported.

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

1. In an excavating apparatus, a sectional bucket formed with a mold-board side, whereby it is held closed as it enters the mass to be removed, substantially as and for the purpose set forth.

2. A bucket of an excavating apparatus, formed of two parts pivoted together, in combination with elbow-levers pivoted at different points to the two parts and provided with gudgeons, the slotted arms, and the frame, substantially as and for the purpose set forth.

3. The frame A, having a bucket and a connected rope or chain, with operating-gearing, in combination with legs pivoted thereto and

carrying gearing which engages with the gearing on the frame, said legs being formed of adjustable pieces, substantially as and for the purpose set forth.

4. The frame, and legs pivoted thereto, in combination with the keepers and connecting-bolts, said bolts being adapted to connect the adjustable pieces of the legs and connect said legs with the keepers, substantially as and for the purpose set forth.

5. In an excavating apparatus, a removable bucket having a slotted back, and the guiding-plate of the bucket, having rotatable buttons, combined and operating substantially as and for the purpose set forth.

6. The removable bridge and pointed nut, in combination with the screw L, having right-and-left threads, and provided with a rigidly-connected wheel or handle, substantially as and for the purpose set forth.

7. The frame, bucket, and operating rope or chain, in combination with the lower pulley for said rope or chain, having an inclosing-casing, substantially as and for the purpose set forth.

8. The combination, with an excavating apparatus, of a cutting device formed of a pivoted cutter attached to a rising-and-falling plate, and provided with a chain or rope, whereby the cutter may enter the mass in an upright position and be brought out in cutting position as it rises through the mass, substantially as and for the purpose set forth.

9. In an excavating apparatus, a rising-and-falling plate, in combination with one or more cutters which may be shifted on the pivoting-rod thereof, substantially as and for the purpose set forth.

10. In an excavating apparatus, a frame having fixed lugs, in combination with pivoted arms carrying pivoted lugs, which are adapted to interlock with said fixed lugs, substantially as and for the purpose set forth.

TIBERIAS DOUGHERTY.

Witnesses:
JOHN A. WIEDERSHEIM,
ELLWOOD S. LINN.