

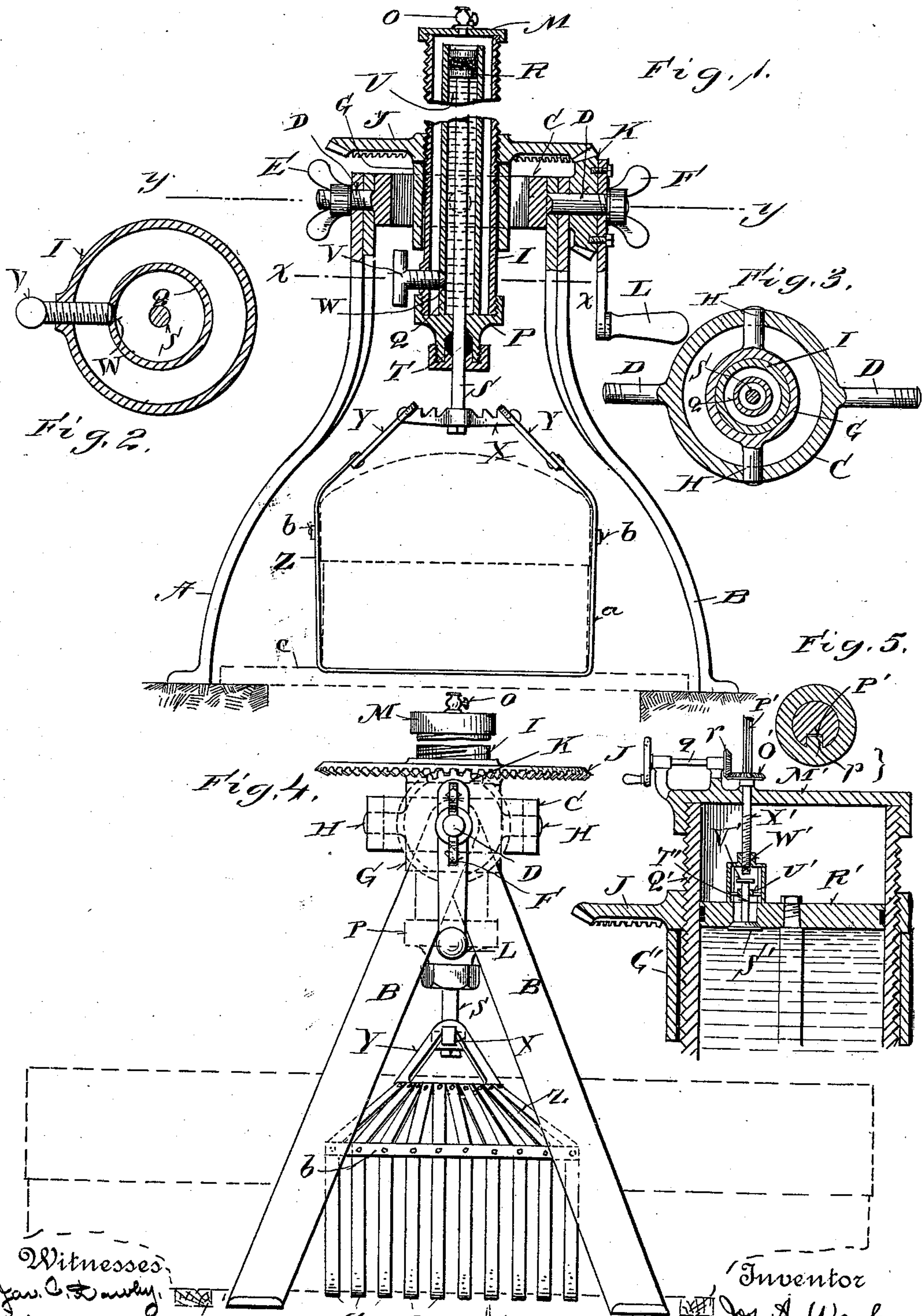
(No Model.)

J. A. WORK.

APPARATUS FOR MANIPULATING GRAVE VAULTS.

No. 543,073.

Patented July 23, 1895.



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APPARATUS FOR MANIPULATING GRAVE-VAULTS.

SPECIFICATION forming part of Letters Patent No. 543,073, dated July 23, 1895.

Application filed April 4, 1895. Serial No. 544,382. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. WORK, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Apparatus for Manipulating Grave-Vaults, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to an apparatus for lowering grave-vaults or caskets into graves and for raising them out of graves.

It is very desirable that the unseemly exertions of gravemen incident to lowering the present heavy grave-vaults, usually made of steel, into graves be entirely done away with for the better order of the solemn occasion. These vaults are very heavy, weighing from three hundred to four hundred pounds, as a
20 general thing, which, with the weight of the coffin and body, make them difficult to quietly and steadily lower, particularly when the ground is damp and soft about the edges of the grave, as it frequently gives in from the pressure of the gravemen standing about the
25 grave.

My apparatus consists essentially of two leading features, namely: a hydraulic lowering mechanism and a more strictly mechanical hoisting mechanism, as more fully herein-
30 after described, and particularly pointed out in the claims.

In the accompanying drawings, on which like reference-letters indicate corresponding parts, Figure 1 is a partial elevation and vertical sectional view of my improved apparatus adjusted to lower a grave-vault into a grave. Fig. 2 is a horizontal sectional view on the line *xx*; Fig. 3, a horizontal sectional
35 view on the line *yy*; Fig. 4, a side elevation of the apparatus with a vault indicated in said view, and Fig. 5 a modification.

The letter A designates a pair of legs or standards adapted to be spread apart at the
45 bottom and overlapping at their upper ends where they are connected together, and the letter B a similar pair of legs so arranged. By preference they are curved, as shown in Fig. 1, so as to straddle the grave to readily
50 bring the mechanism more nearly over the grave. A stout annulus C has trunnions D, which pass through the overlapped ends of

the standards and have thumb-screws E and F to prevent the standards from slipping off. Within this annulus C is another annulus G 55 with trunnions H mounted in the annulus C transversely to the position of the trunnions D. This provides a universal motion, as the annulus C can swing on the trunnions D and the annulus G can swing on the trunnions H. 60 Hence the apparatus supported by these trunnions can be directed in any direction desired in manipulating it for its intended work.

An outer liquid-case I is fitted to slide up and down in the annulus G, and is screw- 65 threaded a portion of its length and has mounted on it a bevel gear-wheel J, screw-threaded to fit the threads of the case. By rotating the gear-wheel J in one direction or the other the case is raised or lowered. A 70 bevel-pinion K is mounted on one of the trunnions D and provided with a crank L, so as to rotate the gear-wheel J. This part of the apparatus I term the "hoisting mechanism," as it is used to hoist the vaults in a manner 75 presently to appear.

The case I has a cap M carrying a petcock O, the latter being to admit atmospheric pressure to the interior of the case. The case also has a bottom P, which supports a cylinder Q 80 within the case with an annular space between it and the case. A piston R is fitted to the cylinder Q and its piston-rod S passes through the bottom P and a stuffing-box T formed with the bottom. A liquid U, preferably oil, though water will answer, is placed 85 in the cylinder Q in sufficient quantity to fill it when the piston is at its upper position. A hand-screw V passes through the case I and is tapered to close an orifice W in the cylinder Q. As long as the liquid is held in the cylinder beneath the piston the latter cannot descend; but by manipulating the hand-screw V the orifice W is opened and the liquid 90 allowed to escape more or less rapidly, according to the rapidity it is desired that the piston and its rod shall have. A notched cross-bar X is carried by the piston S, and links Y are engaged with the notches of the bar and thus connect with the piston-rod the holder 100 Z, which preferably consists of a number of bands or strips of webbing *a*, connected by bars *b* and converging so as to connect at their ends with the respective links Y. This holder

is passed around the vault and arranged to embrace and sustain it.

Now, then, let it be supposed that it is desired to lower a vault into a grave. The apparatus is standing, as shown in the drawings, with the parts adjusted as there indicated. This is preferably done after the vault has been placed upon the cross-bars *c*, and as the apparatus will only weigh about seventy-five to one hundred pounds two men can set it in place in a very easy and quiet manner. The holder having been adjusted to the vault and engaged to the piston an attendant quietly turns the screw *V*, when the liquid slowly escapes from the cylinder into the case, allowing the piston to smoothly and slowly descend with its load. When the casket is brought to rest upon the usual strips of wood in the bottom of the grave one end of the holder is disengaged from the cross-bar *X* in any desired manner and then drawn from under the vault and taken out of the grave either separately or in the act of removing the apparatus.

It will have been seen that in order to lower the vault it is necessary to first withdraw the cross-bar *c*. This is done by slightly elevating the case *I* through the crank and gears when the said cross-bars are withdrawn.

Now, then, if it be desired to hoist a vault out of a grave the case *I* and piston-rod *S* are adjusted to the proper depth, and then the crank is turned and the gears manipulated to cause the gear *J* to raise the case by the screw-threads.

It is obvious that the details of this apparatus may be varied without departing from my invention, and I wish therefore to be clearly understood as not limiting myself to such details, the drawings being merely one exemplification of a complete and practical apparatus embodying my invention.

The petcock *O*, I would observe, is used to admit atmospheric pressure in order to cause the liquid to re-enter the cylinder when the piston *R* is forced from the lower end to the upper end of the cylinder, creating the action commonly called a "sucking" action. In this way the same liquid is used over and over again, being at one time displaced from the cylinder and at another drawn back into the cylinder. The piston is usually forced to up or in position by hand, the hand-screw *V* being fully opened at this time.

Referring now to Fig. 5, it will be seen that in this modification the case *I* is omitted and the cylinder *Q'* exteriorly threaded to receive the gear-wheel *J*. In this form, also, the inner annulus is fitted to the cylinder, as shown at *G'*, instead of to the case *I*, as in the other form. In the modification the liquid is not allowed to escape from the cylinder; but the piston is so constructed that the liquid may be allowed to escape above it, and thus the quantity of liquid in the cylinder beneath the piston be diminished just as the quantity is diminished or lessened in the other form,

though in the latter case by escaping from the cylinder. This underlying principle of lessening the quantity of liquid beneath the piston is common, however, to both forms.

In the modified form the piston *R'* has a valve *S'* with a stem *T'*, guided by a guide *U'*, and having a head *V'* to limit the descent of the valve. A yoke *W* has in it a valve-actuating rod *X'*, adapted to screw down upon the valve-stem and open the valve to let the water escape up through the piston. The rod *X'* slides through the cap *M'* and the pinion *O'*. The rod is grooved, as shown at *P'*, and the pinion has a key *p*, so as to rotatably engage the rod. A crank-shaft *q* is mounted upon the cap *M'* and has a pinion *r*, which meshes with and rotates the pinion *O'*. When it is desired to lower a vault this crank-shaft is rotated and the rod *X'* screwed down upon the stem of the valve *S'* to open it more or less. Then the liquid escapes up past the piston *R'*. When the piston is forced back by hand the liquid settles through it and past the valve.

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

1. In an apparatus for manipulating vaults, the combination with suitable standards, of a cylinder supported by said standards, and a piston rod and piston in said cylinder, devices to suspend the vault from the rod, and means to slowly discharge from the cylinder a quantity of contained liquid to allow the piston to lower its suspending devices and load into the grave.

2. In an apparatus for manipulating grave vaults, the combination with suitable standards adapted to stand over a grave, of a cylinder supported by the standards through a universal joint or connection and adapted to slowly discharge a quantity of liquid therefrom, and a piston and rod arranged to work in the cylinder to descend as the liquid is discharged.

3. In an apparatus for manipulating grave vaults, the combination with suitable standards adapted to stand over a grave, of a case supported by the standards, a cylinder communicating with the case and adapted to discharge a quantity of liquid therefrom into the case, and a piston and its rod working in the cylinder and adapted to be lowered as the liquid escapes.

4. In an apparatus for manipulating a grave vault, the combination with suitable standards adapted to stand over a grave, of a case supported thereby through a universal joint or connection, a cylinder in the case arranged to discharge a quantity of liquid therein, and a piston and rod working in the cylinder and adapted to descend as the liquid escapes.

5. In an apparatus for manipulating a grave vault, the combination with two pairs of standards, an annulus with trunnions fitted to the standards, a second annulus with trunnions mounted in the first annulus, a case supported

by the second annulus and a cylinder supported within the case with a controlled communication between the cylinder and case, and a piston and rod working in the cylinder adapted to descend when the communication is opened and discharging liquid from the cylinder and to draw the liquid back into the cylinder on the reverse movement.

6. In an apparatus for manipulating grave vaults, the combination with suitable standards, of a cylinder supported thereby, a piston and rod in said cylinder, means to lessen the quantity of liquid contained in the cylinder on one side of the piston as it moves in lowering its load, and devices which suspend the vault from the piston.

7. In an apparatus for manipulating a grave vault, the combination with standards adapted to stand over a grave, of a vertical traveling device supported by said standards through a universal joint or connection, a gearing connected therewith to raise and lower it when suspended over a grave.

8. In an apparatus for manipulating a grave vault, the combination with standards adapted to stand over a grave, of a vertical sliding device supported by said standards, and having an exterior screw-thread, of a gear wheel supported by the standards and screwed upon said device, and a crank geared to said gear wheel to rotate the latter and raise and lower said device.

9. In an apparatus for manipulating a grave vault, the combination with standards adapted to stand over a grave, and a vertical sliding device connected therewith by a universal joint or connection, and having an exterior screw-thread, of a gear wheel supported by the standard and carried upon said device, and a crank connected with a pinion meshing with the gear-wheel to rotate it to raise or lower said device.

10. In an apparatus for manipulating a

grave vault, the combination with standards adapted to stand over a grave, an annulus with trunnions fitted to the standards, a second annulus with trunnions mounted in the first annulus, and a case slidingly mounted in the second annulus and having an exterior screw-thread, of a gear wheel resting upon the second annulus and screwed upon said case and a crank with a pinion meshing with the gear wheel, and a device for connecting the case with the grave vault.

11. In an apparatus for manipulating a grave vault, the combination with standards adapted to stand over a grave, a case supported thereby and a cylinder by the case and adapted to discharge liquid into it, gearing to raise and lower the case, and a piston and rod fitted to the cylinder and adapted to descend when the liquid runs out and to draw the liquid back when forced in.

12. In an apparatus for manipulating a grave vault, the combination with said standards, an annulus trunnioned thereto, a second annulus trunnioned to the first, a case mounted in the second annulus and having a screw threaded exterior, a gear wheel resting upon the second annulus and screwed upon the case, and a crank with a pinion meshing with the gear wheel, and a cylinder in the case, with a controlled communication discharging into it, and a piston and rod in the cylinder for the purpose set forth.

13. In an apparatus for manipulating a grave vault, the combination with a piston rod and a cross-bar, of a vault holder adapted to embrace the vault and detachably connect it with the cross-bar.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH A. WORK.

Witnesses:

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