J. M. ROBIN.

LIFTING POWER.

APPLICATION FILED MAY 16, 1907.

915,114.

Patented Mar. 16, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

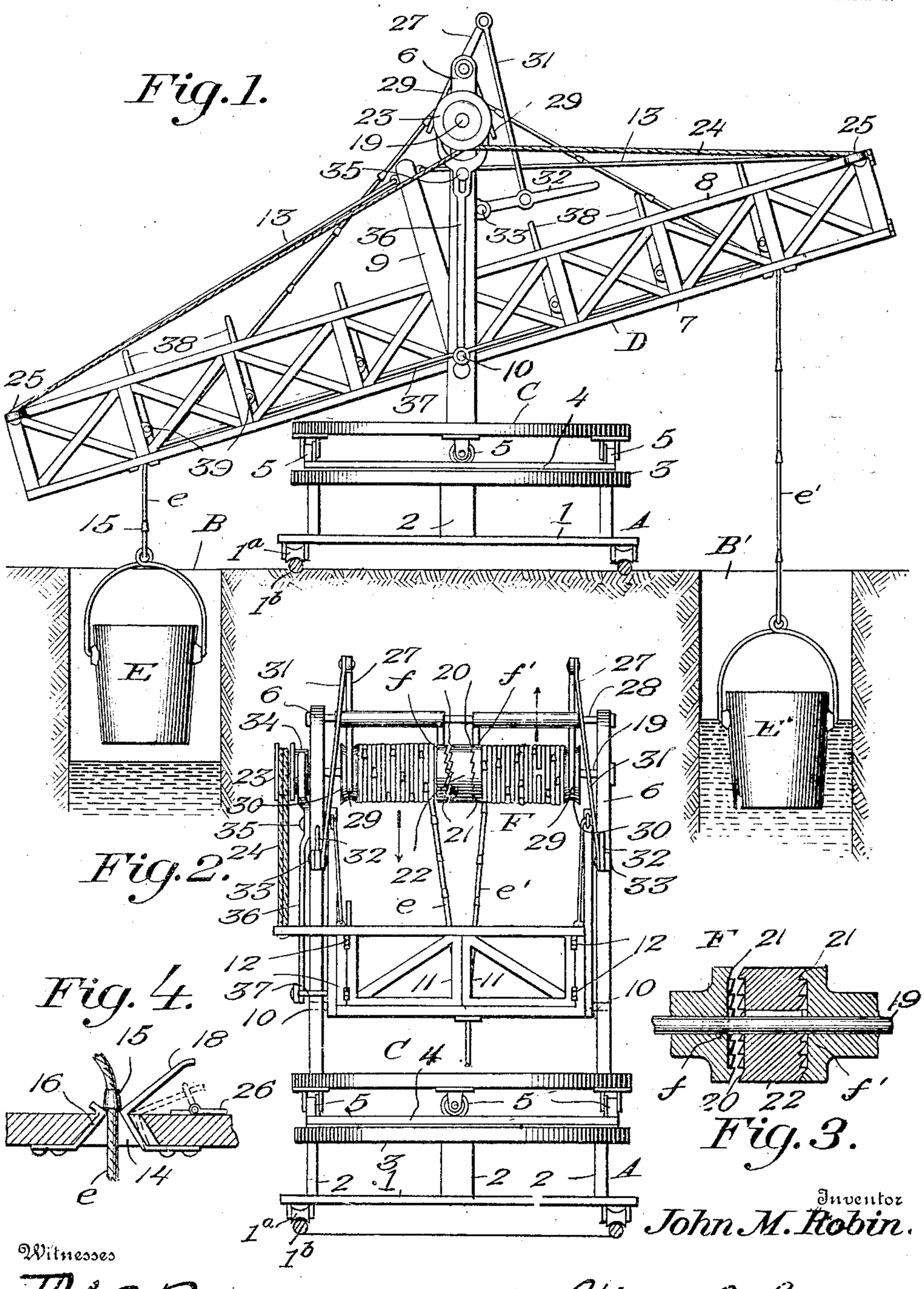

Fig. 2.

Fig. 3.

Fig. 4.

Witnesses

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C. Bradway.

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2 SHEETS—SHEET 2.

Fig. 5.

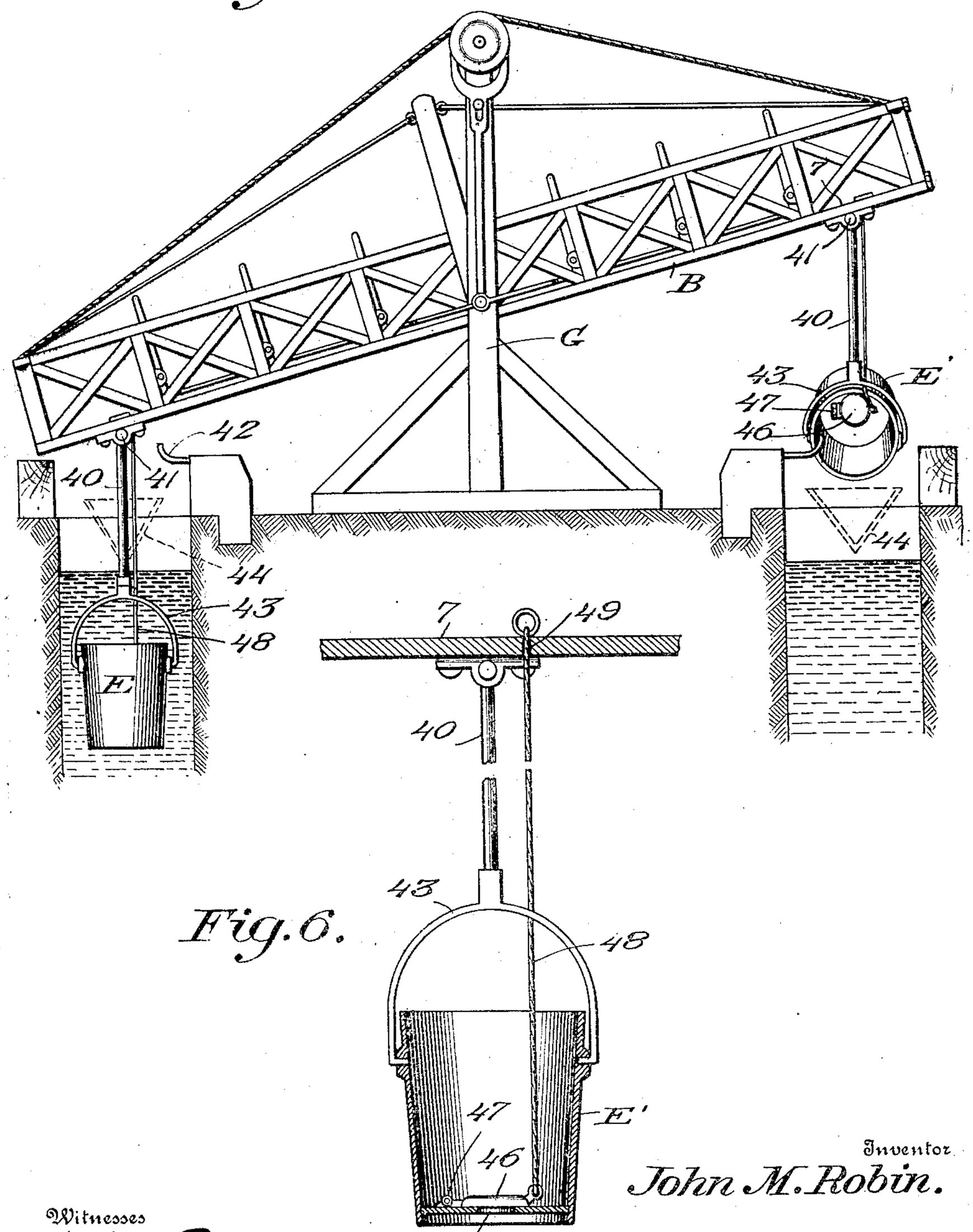

Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN M. ROBIN, OF KLAMATH FALLS, OREGON.

LIFTING-POWER.

No. 915,114. Specification of Letters Patent. Patented March 16, 1909.

Application filed May 16, 1907. Serial No. 374,106.

To all whom it may concern:

Be it known that I, JOHN M. ROBIN, a citizen of the United States, residing at Klamath Falls, in the county of Klamath and State of Oregon, have invented new and useful Improvements in Lifting-Power, of which the following is a specification.

This invention relates to lifting apparatus of that type in which horse power is employed whereby water can be lifted from wells or other sources and discharged into irrigating ditches, by which earth can be removed from ditches, cuts or the like or whereby heavy objects can be raised in a simple, efficient and inexpensive manner.

The invention has for one of its objects to improve and simplify the construction and operation of apparatus of this character so as to be comparatively easy and inexpensive to manufacture and install, thoroughly reliable in service, and readily controlled.

A further object of the invention is the provision of lifting apparatus composed of an oscillating cage or pen in which one or more horses or other animals are adapted to be driven from end to end thereof to thereby cause the cage to tilt for the purpose of alternately raising buckets or other suitable load-carrying devices from which the contents can be delivered at any suitable point.

A further object of the invention is the provision of a lifting device of the character referred to in which the cage is mounted on a turn table so that the buckets or load-carrying devices can be moved back and forth between the point of loading and point of discharge, as for instance, in loading earth from cuts, ditches or the like, to dirt cars.

Another object is the employment of means whereby the buckets or load-carrying devices can be raised step by step by the oscillation of the cage for lifting heavy loads, the said means being so designed as to permit the empty buckets to be quickly lowered to the points of loading.

The invention has as a further object, the provision of a controlling mechanism for permitting the operator to control the speed of the oscillatory movement of the cage.

An additional object is to provide lifting buckets having means for permitting an excessive amount of material to be discharged from the bucket, should the original load be greater than the power of the apparatus.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one of the embodiments of the invention, Figure 1 is a front view of the apparatus illustrating the operation thereof. Fig. 2 is an end view of the apparatus. Fig. 3 is a sectional view of the double clutch of the drums for winding and unwinding the bucket-carrying tables. Fig. 4 is a detail sectional view of one of the catches for permitting the cables to be raised step by step by the oscillation of the cage. Fig. 5 is a front view of a modified form of lifting apparatus. Fig. 6 is a detail sectional view of one of the lifting buckets.

Similar reference characters are employed to designate corresponding parts throughout the several views.

In the present instance, I have elected to illustrate the invention as a water-lifting device, but it is obvious that it may be used for many other purposes when material is to be lifted from one point to another.

Referring to the drawings, A designates a supporting frame composed of a base 1, uprights 2, and a platform 3 on which is arranged a circular track 4, the supporting structure being located between the wells B and B'. Mounted on the frame A is a turn-table C provided with wheels 5 at diametrically opposite points resting on the circular track 4, and rising from the turn-table are spaced standards 6 between which is disposed an oscillatory structure D in the form of a cage or pen and comprising a floor 7, a railing 8, and central upright posts 9. At the middle of the cage and extending oppositely from the floor thereof are horizontal pivots 10 journaled in the standards 6, as clearly shown in Fig. 2 for pivotally mounting the cage D. The ends of the cage are formed into gates 11 hinged at 12 to the sides of the cage so that the horses can be driven into and out of the cage. Extending between and secured to the corners of the cage and the upper ends of the posts 9 are brace rods 13 for giving rigidity to the structure. By mounting the cage in this manner, it is capable of having an oscillatory movement on a horizontal axis formed by the pivots 10 and of a turning movement about the vertical axis of the turn table C. On the base

1 may be provided rollers 1^a which run on tracks 1^b for permitting the apparatus to be moved from point to point.

Under the ends of the cage are buckets or loading devices E and E′ of any approved form, which are attached to the ends of separate cables *e* and *e′*. These cables are connected with a winding device designated generally by F, whereby the oscillatory movement of the cage will raise the buckets step by step from any depth. The cables project through openings 14 in the floor of the cage adjacent the ends thereof, one of which openings is clearly shown in Fig. 4. Disposed at suitable intervals along the cables are stop devices 15 preferably in the form of collars that taper upwardly and which coöperate with clamping devices arranged at the openings 14. Each device consists of a stationary jaw 16 and a spring-movable jaw 17 which yields in a direction away from the fixed jaw when a collar engages the same as the cable is pulled upwardly, and springing inwardly to coöperate with the fixed jaw for engaging under a collar 15 to prevent the cable from being drawn downwardly through the opening by the weight of the bucket and its contents. The spring jaw 17 of each cable-clamping device is extended into a foot piece 18 whereby the operator can spring the jaw to one side when it is desired to permit the empty bucket to be lowered by the cable to the place of loading.

The winding device F comprises a pair of drums *f* and *f′* loosely mounted and spaced apart on a horizontal shaft 19 journaled in the standards 6 adjacent the upper ends thereof. The opposed ends of the drums are formed into reversely disposed ratchet teeth 20 which engage with ratchet teeth 21 formed on opposite sides of the disk 22 that is splined on the shaft 19, as clearly shown in Fig. 3. The disk or element 22 is adapted to slide on the shaft 19 so as to be automatically engaged with the teeth of one drum and disengaged from the teeth of the other drum by the alternate rocking movement of the shaft 19. In other words, the drums *f* and *f′*, to which the cables E and E′ are respectively connected, are alternately rotated step by step so that the cables can be wound thereon and the buckets elevated.

It is to be noted that sufficient clearance is provided between the disk 22 and the drums *f* and *f′* so that the teeth at one side of the clutch element 22 will engage the corresponding teeth of one drum, while the teeth 21 on the opposite side of said element disengage the teeth of the other drum. During the initial part of the movement of the shaft 19 in either direction, the clutch element 22 will be shifted, by reason of the shape of the ratchet teeth, from one drum to the other, which is thereby clutched to the shaft to move therewith. For actuating the shaft 19, the latter is provided at one end with a spool 23 around which is lapped a cable 24 whose ends are fixed at 25 to the front corners of the cage. As the shaft 19 is located a considerable distance from the pivots 10 on which the cage oscillates, and since the shaft 19 is relatively stationary as compared with the cage, the cable 24 will cause the spool 23 to be turned alternately back and forth with the oscillations of the cage. As one cable is wound on its drum, the other cable is prevented from unwinding because the stop device 15 therefor sustains the weight of the load-carrying device attached to such cable, so that little, if any, draft on the cable exists to cause unwinding thereof. It will thus be seen that the buckets or load-carrying devices E and E′ will be raised step by step by the winding device F until the buckets have been raised clear of the wells. After this point is reached, the horse or horses can be stopped at the center of the cage so that the latter will be perfectly balanced in a horizontal position for the purpose of permitting the cage to be turned for carrying first one bucket to a point of convenient unloading, and then the other bucket. After the buckets have been thus unloaded, the cage is turned back to its original position and the buckets permitted to descend into the wells for a second filling. To do this, the spring jaws 18 are released from the cable and they can be held released by suitable devices, such for instance, as links 26 attached to the floor, and which can be thrown over the extremities of the jaws, as will be understood by reference to Fig. 4. For preventing the buckets from descending too rapidly, a brake device is provided with each drum so as to retard the unwinding of the cables. For this purpose, a brake lever 27 is fulcrumed above each drum on a shaft 28 and the lower end of the lever is provided with bifurcations 29 forming shoes for gripping the concaved portions 30 of the adjacent drum. The upper end of each brake lever is connected by a rod 31 with an operating lever 32 fulcrumed at 33 on one of the standards 6, so that by manipulating the lever, one or the other of the bifurcations or brake shoes can be thrown into gripping relation with the drum. The buckets are adapted to be lowered one at a time so that after the operator controls the lowering of a bucket by one operating lever 32, he crosses to the opposite side of the cage and lowers the other bucket by the other lever 32.

A brake device is provided for the purpose of permitting the operator to prevent the cage from tilting too rapidly, and for this purpose, the shaft 19 is equipped with a brake drum 34 adjacent the spool 23, and pivoted at 35 on one of the standards 6 is a brake lever 36 having its upper end bifurcated to span the drum for engagement

therewith at opposite points. The lower end of the brake lever 36 is connected with the rod 37 extending longitudinally of the cage adjacent one side thereof and arranged with the middle portion bowed outwardly around the front standard 6, while the extremities are disposed within the cage. The extremities of the operating rod 37 are provided with spaced levers 38 fulcrumed at 39 on the sides of the cage so that the operator can actuate the rod 37 from different points within the cage, the lower ends of the levers being connected with the rod so that by moving any lever in one direction or the other, the rod will be shifted longitudinally and the brake lever 36 tilted so that one of its bifurcations will frictionally grip the brake drum 34 and thereby retard the rotation of the shaft 19, with the result that the cage is prevented from tilting too fast. In other words, when any lever 38 is pulled to the right, Fig. 1, the rod 37 will be shifted to the left and tilt the brake lever 38 so that the left bifurcation thereof will frictionally engage the brake drum 34 and prevent the cage from tilting suddenly. If any brake actuating lever 38 is tilted to the left, the rod 37 is moved to the right to correspondingly tilt the brake lever 36 for causing the right bifurcation of the latter to frictionally engage the brake drum 34 and retard the tilting movement of the cage.

In the modification shown in Fig. 5, the cage D is mounted to oscillate on a fixed frame G, and the operating mechanisms are similar to those described in connection with Fig. 1, except that no bucket-suspending cables and winding drums are employed. The buckets E and E′ are suspended by means of links or rods 40 that are hingedly connected at 41 with the bottom of the cage. Located in the path of each bucket is a bucket-turning device 42 which engages the top of the bucket as the latter is raised so that the latter will be turned on its bail 43 so as to empty the contents into a trough or other device 44, as shown at right hand of Fig. 5. Should the load in either bucket be greater than the lifting power, provision is made for permitting part of the contents to be discharged, and to this end, each bucket has an opening 45 in its bottom as shown in Fig. 6, which is normally closed by a valve 46 hinged at 47, and attached to the valve is a flexible element or cord 48 that passes upwardly through an opening 49 in the floor 7 of the cage so that it can be grasped by the operator for permitting the valve to be opened to let out part of the contents of the bucket. It will thus be seen that the overloading of the buckets can be easily and effectively prevented so that the operation of the apparatus will not be materially interfered with.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims.

Having thus described the invention, what I claim is:—

1. In an apparatus of the class described, the combination of an oscillatory structure, in the form of an inclosure and adapted to be actuated by an animal traveling alternately from end to end thereof a frame on which the structure is pivoted, load-carrying devices mounted on the structure, a brake element rotatably mounted on the frame, a flexible element connected with the structure at opposite sides of the pivot thereof and arranged to rotate the said element alternately in opposite directions, a device mounted on the frame for frictionally engaging the element for retarding the movement of the structure, and means mounted on the structure and connected with the device for actuating the latter.

2. In an apparatus of the class described, the combination of an oscillatory structure, of suitable length for an animal to travel back and forth to oscillate the same a frame on which the structure is pivoted, a brake element mounted on the frame, a flexible element having its ends secured to the structure at opposite sides of the pivot, means engaged by the flexible element for rotating the brake drum alternately in opposite directions by the oscillation of the structure, a brake lever mounted on the frame to frictionally engage the brake element, a rod connected with the lever, and a plurality of operating levers mounted on the structure and connected with the rod for actuating the brake lever from different points.

3. In an apparatus of the class described, the combination of an oscillatory structure adapted to be operated by animal power, load-carrying devices mounted on and disposed under the same, and manually actuated means controlled from the structure for discharging any excess material in either device.

4. In an apparatus of the class described, the combination of an oscillatory structure adapted to be operated by animal power, and of such length as to permit an animal to travel back and forth thereon a mounting including means for permitting the structure to be turned on a vertical axis, and load-carrying devices connected with the structure.

5. In an apparatus of the class described,

the combination of an oscillatory structure adapted to be operated by animal power, a mounting including means for permitting the structure to be turned on a vertical axis, load-carrying devices connected with the structure, and a brake device for retarding the oscillatory movement of the structure.

6. In an apparatus of the class described, the combination of an oscillatory structure, load-carrying devices, connected with the structure and disposed under the same and a mechanism for alternately raising the devices step by step through the oscillation of the structure.

7. In an apparatus of the class described, the combination of an oscillatory structure, load-carrying devices, connected with the structure and disposed under the same cables supporting the devices, and a mechanism for alternately winding the cables to raise the devices step by step through the oscillation of the said structure.

8. In an apparatus of the class described, the combination of an oscillatory lifting structure, a turn-table on which the structure is mounted, a circular track on which the table turns, a supporting frame carrying the circular track, and a second track on which the supporting frame runs to move the apparatus from point to point, load-carrying elements, connected with the structure and disposed under the same cables connected with the elements, winding devices for the cables, and means for actuating the winding devices alternately by the oscillation of the structure for elevating the load-carrying devices.

9. In an apparatus of the class described, the combination of an oscillatory structure adapted to be operated by animal power, said structure being of such length as to permit an animal to travel from one side of the center of oscillation to the other for oscillating the structure, load-carrying devices, flexible elements connected therewith, winding drums connected with the elements, means for alternately rotating the drums by the oscillation of the structure, and cable gripping devices on the structure coöperating with the winding drums to elevate the load-carrying devices step by step.

10. In an apparatus of the class described, the combination of a movable structure adapted to be actuated by animal power, said structure being of such length as to permit an animal to travel from one side of the center of oscillation to the other for oscillating the structure, load - carrying devices mounted thereon, and a mechanism for elevating the devices step by step and for permitting the devices to be lowered quickly.

11. In an apparatus of the class described, the combination of a movable structure adapted to be actuated by animal power, said structure being of such length as to permit an animal to travel from one side of the center of oscillation to the other for oscillating the structure, load - carrying devices mounted thereon, a mechanism for elevating the devices step by step and for permitting the devices to be lowered quickly, and braking means for controlling the lowering of the devices.

12. In an apparatus of the class described, the combination of an oscillatory structure adapted to be actuated by animal power, load-carrying devices, flexible elements connected with the devices, gripping means on the structure for preventing the cables from moving downwardly while the devices are loaded and adapted to be released for permitting the devices to be lowered, a shaft rotated alternately in opposite directions by the structure, winding devices on the shaft and to which the flexible elements are connected, and automatic means for alternately actuating the winding devices by the shaft.

13. In an apparatus of the class described, the combination of an oscillatory structure, load-carrying devices, flexible elements connected with the devices, spaced stops on the elements, gripping devices on the structure adapted to permit the elements to be drawn upwardly and for gripping the stops to prevent the elements from moving downwardly, a winding mechanism for the elements, and means between the mechanism and structure for operating the former by the latter.

14. In an apparatus of the class described, the combination of an oscillatory structure, a frame in which the structure is mounted, load-carrying devices, flexible elements connected with the devices, a shaft on the frame, a mechanism between the structure and shaft for rotating the latter alternately in opposite directions, a brake device on the shaft for retarding the oscillatory movement of the structure, winding drums on the shaft, an automatic clutch for gripping the drums alternately to the shaft, means coöperating with the drums for moving the elements step by step for elevating the load-carrying devices and for permitting the latter to be quickly lowered, and a brake device for each drum to retard the unwinding movement of the drums.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN M. ROBIN.

Witnesses:
MINNIE J. BONNEY,
S. V. M. BONNEY