

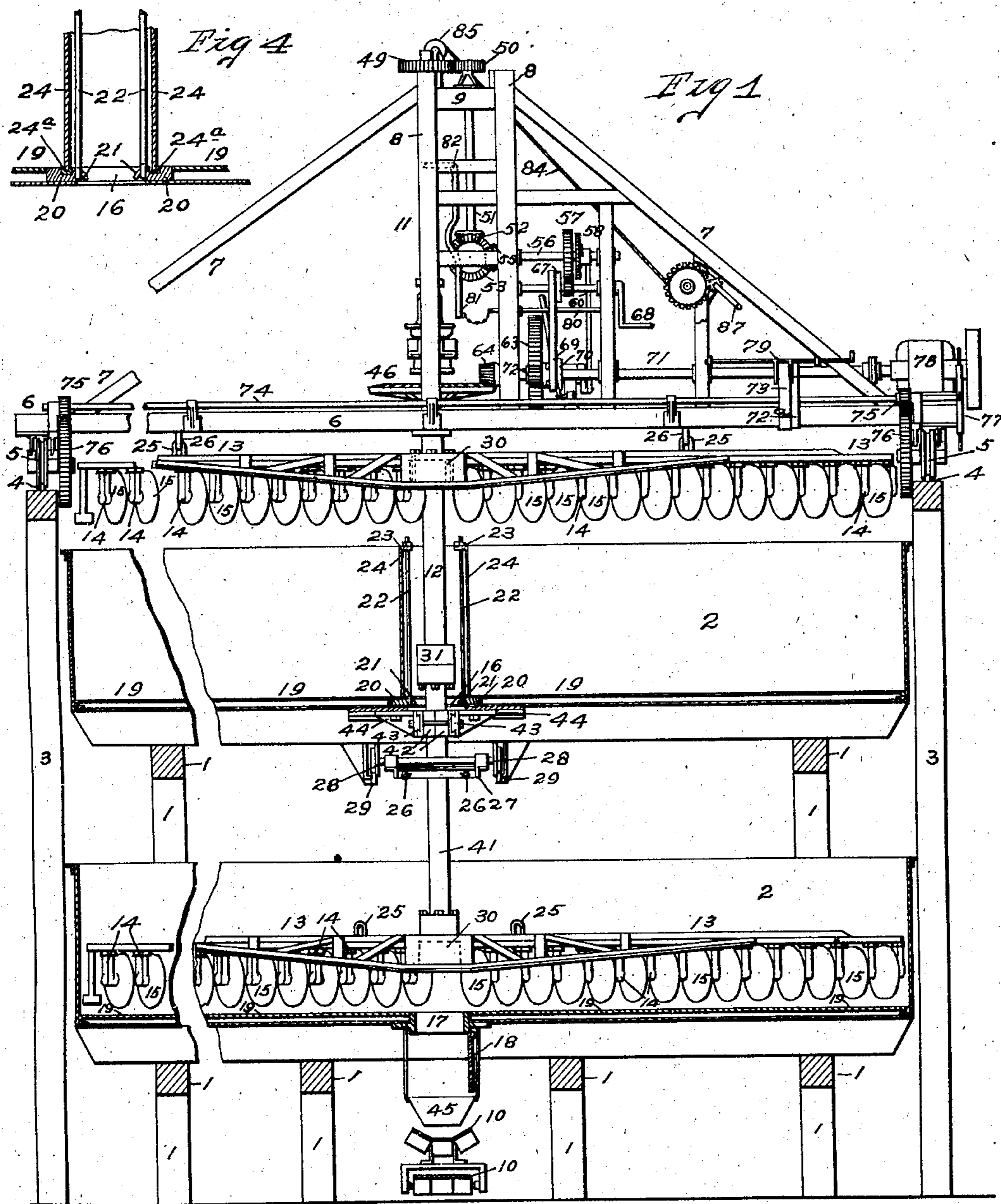
No. 816,065.

PATENTED MAR. 27, 1906.

H. W. BLAISDELL.
SYSTEM OF EXCAVATING AND FILLING VATS.

APPLICATION FILED OCT. 23, 1902.

3 SHEETS—SHEET 1.



Witnesses
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Chas. F. Fiege

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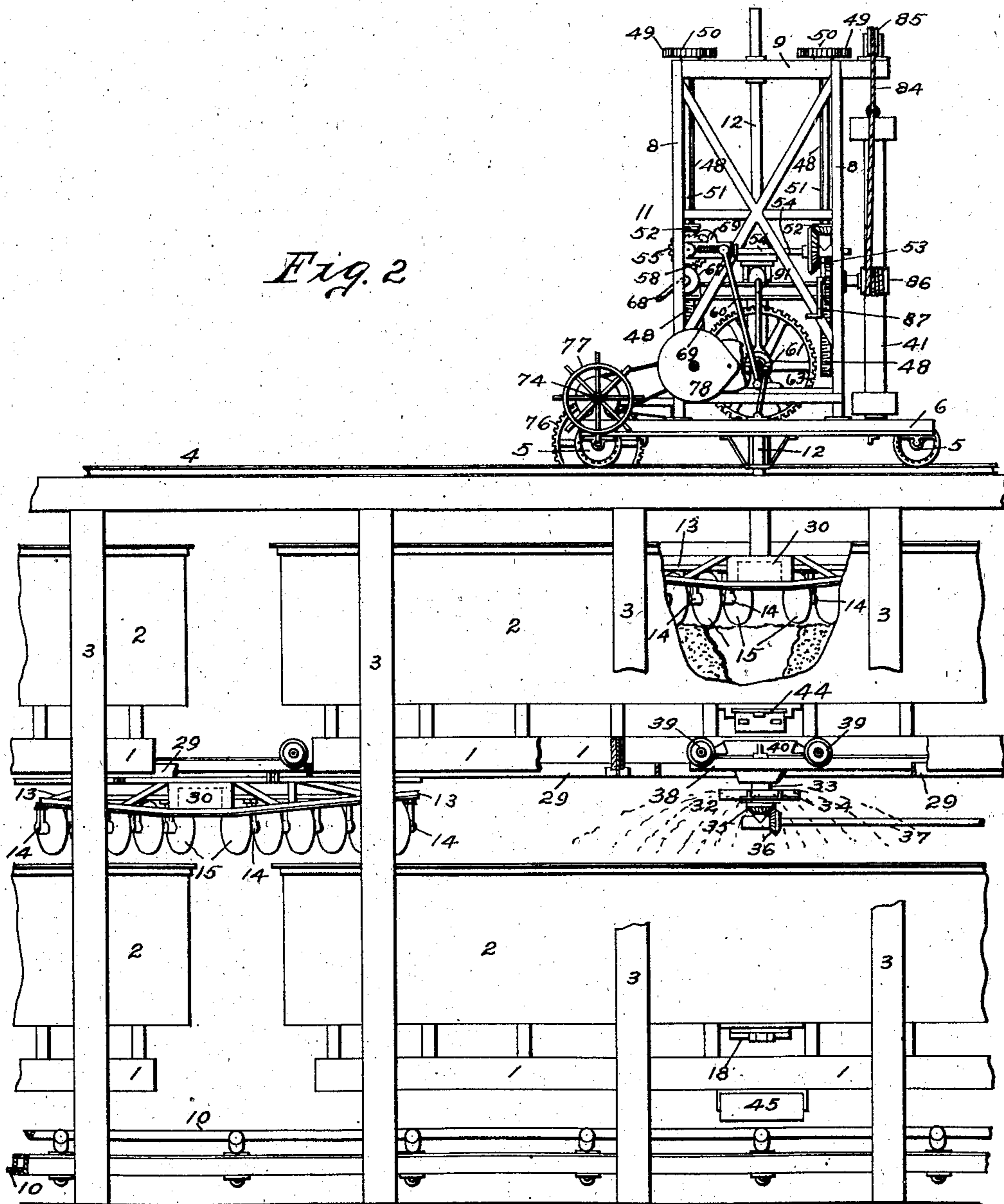
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3 SHEETS—SHEET 2.



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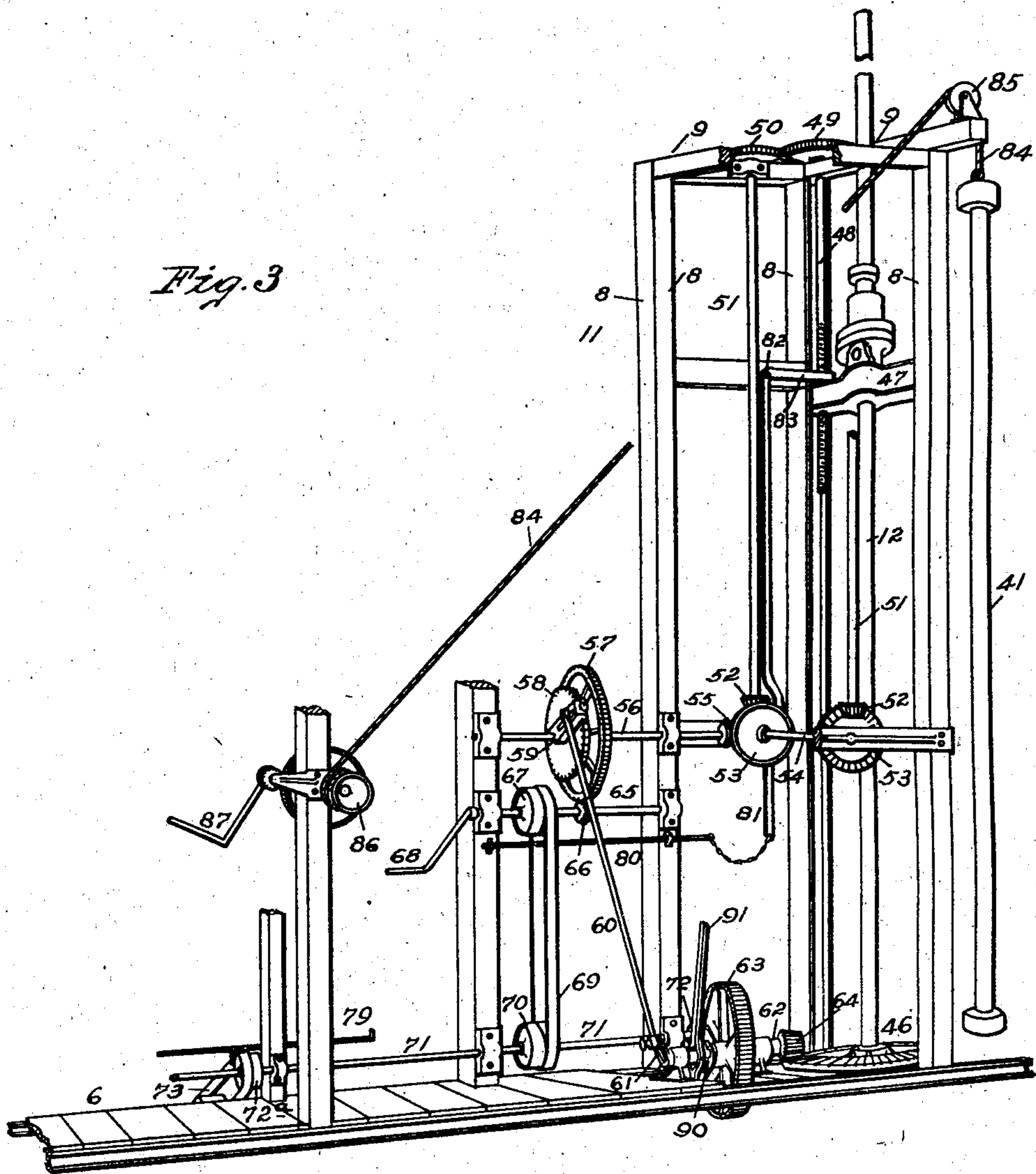
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HIRAM W. BLAISDELL, OF LOS ANGELES, CALIFORNIA.

SYSTEM OF EXCAVATING AND FILLING VATS.

No. 816,065.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed October 23, 1902. Serial No. 128,507.

To all whom it may concern:

Be it known that I, HIRAM W. BLAISDELL, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Systems of Excavating and Filling Vats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to conveyers, and particularly to a system of excavating and filling cyanid or other vats or receptacles; and some of the objects of this invention are to provide a system of this general character which will be comparatively simple in construction, while being rapid and efficient in operation.

Another object of the invention is to provide means for rapidly filling and emptying bins, vats, or other receptacles and to distribute the material supplied to the bin or vat evenly throughout the entire area thereof and which can be operated to gradually feed the contents of the bin or vat to a central discharge-opening.

It is also an object of this invention to provide means for discharging and distributing the material within the vat or receptacle in a uniform manner in a finely-divided state by centrifugal action.

A further object of the invention is to provide means for filling and emptying, as well as distributing, the material operated upon in a plurality of tiers of vats or receptacles and also to provide such means constructed to be transported from one tier of vats or receptacles to another.

With these and other objects in view the invention consists, essentially, in the construction, combination, and arrangement of parts, substantially as more fully described in the following specification, and as illustrated in the accompanying drawings, forming part of this application, in which—

Figure 1 is a sectional view through a tier of vats or receptacles, showing the operative mechanism in elevation, partly broken away. Fig. 2 is a side elevational view, partly broken away, taken at right angles to Fig. 1. Fig. 3 is an enlarged perspective view of the actuating mechanism, and Fig. 4 is a detail of construction.

Similar characters of reference designate

corresponding parts throughout the several views.

Referring to the drawings, the reference character 1 designates a trestle-work or framing supporting vats or receptacles 2, here shown as arranged in two tiers; but any number of tiers may be employed and any number of tiers can be arranged in a line in order that the means for filling and emptying the vats or receptacles, as well as distributing the material therein, may be moved from one tier of vats or receptacles to another, as hereinafter more fully explained. Arranged on each side of the tiers of vats or receptacles are timbers 3, supporting track-rails 4, whereon travel wheels 5, on which is mounted a frame or platform 6, supporting inclined braces 7, connected with uprights 8, attached to cross-pieces 9, and constituting a central vertical frame 11, provided with suitable braces, all whereof forms a traveling structure or bridge which may be of any desired construction and formation arranged to support the actuating mechanism substantially as shown. Beneath the lower vats is preferably disposed an endless conveyer 10, constructed to receive the treated material from each of the lower vats and to convey the same to the place of deposit or for further treatment, as will be readily understood.

Suitably mounted in the vertical frame 11, so as to permit of vertical movement, is a shaft 12, having a plurality of arms 13, carrying depending brackets or hangers 14, revolubly supporting concavo-convex disks or other devices 15, preferably arranged at such an angle in relation to the arms 13 as to progress or turn over the material within the vats or receptacles 1 toward the central discharge-opening therein, which opening is designated by the reference character 16 in the upper vats or receptacles and 17 in the lower vats, the latter opening being preferably closed by a hinged or sliding door 18 or in any other suitable manner.

The upper tanks or receptacles are preferably provided with a double bottom 19, having a central opening registering with the opening 16, and a ring or other device 20 is preferably secured between the bottom of the upper tank around the opening 16 therein, and said ring 20 is preferably provided with hooks or other devices 21 to receive eyes upon one end of the clamping-rods 22, passing through openings in the flange 23 upon the sleeve 24, located upon a packing

24^a, Fig. 4, resting on the bottom 19 of each of the upper tanks around the opening 16 in the bottom of such tank, substantially as illustrated in Figs. 1 and 4 of the drawings.

5 By means of this construction the shaft 12 may be extended and operated through the upper tank and act upon the material in the lower tanks whenever it is desired to do so and when this operation is effected the loops

10 or eyes 25 upon the upper set of arms 13 are engaged by the hooks 26 upon the frame or platform 6, Fig. 1, as subsequently explained. The lower set of arms 13 are also preferably provided with loops or eyes 25,

15 constructed to be engaged by hooks 26 upon a truck or carriage 27, supported upon wheels 28, traveling upon tracks or ways 29, desirably depending and supported from the frame or trestle work whereon the upper vats are

20 supported, substantially as illustrated in Figs. 1 and 2 of the drawings.

The shaft 12 is preferably provided with a recessed collar 30, carrying arms 13 and having bolts tapped therein to enter threaded

25 openings in the enlarged end or head 31 of said shaft when it is desired to operate upon the material in the upper tanks, it being understood that the sleeve 24 and rods 22 will then have been removed substantially as

30 shown in Fig. 2, and the arms 13 will then be rotated by the action of the shaft 12, so that the disks 15, carried by the upper set of arms, will progress or turn over the material in the

35 upper tank toward the center thereof, whereby it will drop through the opening 16 upon the centrifugal distributor 32, which will evenly and uniformly distribute the material over the bottom of the lower tank or receptacle, as hereinafter more fully explained.

40 The centrifugal distributor 32 embodies a vertical shaft 33, carrying radial arms 34, preferably of different length, and the shaft is preferably provided with a bevel-pinion 35, driven by a beveled wheel 36 upon the

45 drive-shaft 37, which may be actuated in any suitable manner, (not shown,) and the centrifugal distributor 32 is preferably mounted on a carriage or truck 38, having wheels 39, constructed to travel on the tracks 29, before

50 referred to, and a hopper or chute 40 may be mounted in or upon said truck to direct the material upon the distributor. By means of this construction the centrifugal distributor may be moved along beneath each of the vats

55 or receptacles and discharge the material from the upper vat into the vat below in an even and uniform manner, while subjecting the material so distributed to the action of the air, so essential in treating certain classes

60 of material. When the centrifugal distributor is used, it is forced along upon its tracks 29 under the vat to be emptied; but when the lower set of arms 13 are to be used the centrifugal distributor is moved away and a

65 removable shaft-section 41 is lowered by

means of the windlass or drum 86 and is connected with the head 31 of the shaft 12 and with said arms by means of tapped bolts, and said shaft-section is guided and steadied in a

two-part bearing 42, secured between jaws 70 43 upon brackets or hangers 44, mounted beneath the upper tank or upon the framing 1, supporting the same, substantially as illustrated. In this manner the shafts 12 and 41

75 are guided and steadied, and the lower set of arms 13 can be readily operated within the lower tank or receptacle for the purpose of progressing or turning over the material which has been uniformly discharged therein by the centrifugal distributor toward the cen-

80 tral discharge-opening 17 in the lower tank, from which the material falls into a hopper or chute 40, which directs the same upon an endless or other conveyer 10, for transportation to the place of deposit or further treat-

85 ment.

The mechanism for actuating the operative parts before described preferably consist in the shaft 12, splined or feathered to a large

90 bevel-wheel 46, Figs. 1 and 3, and upon the shaft 12 is mounted a cross-head 47, working in guides or ways in the vertical frame 11 and having threaded connection with one or more

95 threaded rods 48, mounted in said frame and carrying gear-wheels 49, meshing with a gear-wheel 50 on a rod 51, also mounted in said frame and carrying a beveled pinion 52, meshing with a beveled gear-wheel 53 upon

100 the shaft 54, and with said beveled gear-wheel 53 meshes a beveled pinion 55 upon the shaft 56, carrying a large gear-wheel 57 and a ratchet-wheel 58, engaged by a pawl or

105 ratchet device 59, connected with a link 60, attached adjustably to a crank 61 upon the driven shaft 62, carrying a loose gear-wheel 63 and a beveled pinion 64, meshing with the

110 large beveled gear-wheel 46 on the shaft 12, while a clutch 90, operated by a clutch-lever 91, throws said wheel 63 into and out of engagement with the driven shaft 62 substantially as particularly illustrated in Fig. 3 of

115 the drawings. A shaft 65 may also be mounted in the vertical frame 11 parallel with the shaft 56 and may be provided with a pinion 66, meshing with the gear-wheel 57 on said shaft, and loose and fast pulleys 67 may also

120 be mounted on the shaft 65, which has a crank or handle 68 to rotate the same, and belts 69 pass over one or other of the pulleys 67 on the shaft 65 and over one or other of the pulleys 70 on the driving-shaft 71, having

125 a pinion 72, meshing with the large gear-wheel 63 on the shaft 62, and on the driving-shaft 71 are fast and loose pulleys 72^a, connected by a belt 73 with fast and loose pulleys upon the propelling-shaft 74, carrying a

130 pinion 75 at each end thereof, meshing with gear-wheels 76 upon the shafts of the track-wheels 5, supporting the traveling structure or bridge before described; but, if desired,

one or more hand-wheels 77 may be secured upon the propelling-shaft 74 to provide means for rotating the same. An electric motor or other apparatus 78 may be provided to rotate the driving-shaft 71, and a belt-shift 79 may be provided for the belt 73, and the belt 69 may be automatically shifted from the fast pulleys 67 and 70 to the adjacent loose pulleys by means of a sliding rod 80, flexibly connected with the long arm 81 of a bell-crank lever 82, the short arm 83 whereof contacts with or rests upon the cross-head 47 and is elevated by the upward movement of the latter to shift the belt 69 when the shaft 12 is elevated by the action or rotation of the threaded rods 48, rotating in the cross-head 47 and actuated by the wheels 49 and 50, the beveled pinion 52, the beveled gear-wheels 53, bevel-pinion 55, shaft 56, ratchet-wheel 58 thereon, links 60, gear-wheel 63, and pinion 72 on the driving-shaft 71, substantially as shown. By means of this construction the shaft 12 is automatically elevated or depressed through the mediation of the parts just described, or said shaft can be raised or lowered by hand when the belt 69 is on the loose pulleys 67 and 70 by turning the crank 68, thereby rotating the pinion 66 thereon, which in turn rotates the gear-wheel 55 with the result before attained automatically.

The removable shaft-section 41 may be supported, lowered, and raised from the vertical frame 11 by means of a rope or cable 84, passing up over a sheave 85 and being connected with a drum 86, wound by means of a crank 87, essentially as illustrated in Fig. 3 of the drawings.

The operation of this invention will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following explanation thereof. If it is desired to move the material from the upper vat to the lower empty vat or receptacle, the sleeve 24 will be removed by means of the rope 84 and drum 86, and the centrifugal distributor 32 will be forced along upon the tracks 29 until it is directly below the discharge-openings 16 and will then be put in motion through its driving-shaft 37, while the shaft 12 will be rotated by the gear-wheel 46, pinion 64, driven shaft 62, carrying the loose gear-wheel 63, rotated (when the clutch 90 is engaged therewith) by the pinion 72 on the driving-shaft 71, substantially as before explained. The rotation of the shaft 12 carries with it the arms 13, which have been previously disengaged from the hooks 26 upon the platform 6 of the traveling structure or bridge and have been lowered upon and bolted to the enlargement or head 31 of the shaft 12 in the manner shown in Fig. 2 of the drawings, whereby the rotation of the arms 13 causes the disks 15 carried thereby to progress or turn over the material within the upper tank toward the

central openings 16 thereof, from whence the material falls into the chute or hopper 40 upon the traveling carriage or truck 38 and is thereby directed upon the centrifugal distributor 32, actuated by its driving-shaft 37 and pinions 36 and 35, substantially as before stated. By means of the rapid rotation of the centrifugal distributor the material is uniformly and evenly distributed upon and over the bottom of the lower tank or receptacle and is at the same time subjected to the action of the air in a finely-divided state. After the upper vat or receptacle shall have been thus emptied of its contents the centrifugal distributor will then be moved from under the discharge-opening 16, and the shaft 12 will be elevated in the manner before described and will be disconnected from the upper set of arms 13, which are then supported upon the hook or other devices 26, as in Fig. 1, whereupon the bridge is removed into position and the shaft 12 is again lowered, and the shaft-section 41 is also lowered by means of the drum and rope 84 and is attached to the head 31 of the shaft 12, as well as to the lower set of arms 13, which are at that time supported from their carriage or truck, Fig. 2, that has before been moved under the discharge-opening 16 of the upper vat in order to permit the connection or attachment of the shaft-section 41 with said lower set of arms, as will be readily understood, whereupon the shaft 12 is rotated as before and the lower set of arms 13 progresses or turns over the material in the lower vat or receptacle toward the discharge-opening 17 therein, through which opening the material falls into the chute or hopper 45 to be directed upon the endless conveyer 10 therebelow, which transports the material to the place of final deposit or for further treatment after such material shall have been treated in the upper and lower tanks, as described.

It is not desired to limit or confine this invention to one row of tiers or vats or to two vats in each tier, as any number of rows may be employed, as well as any number of vats in each tier; nor is this invention limited to use with the particular excavating arms or disks shown and described or to the particular distributor disclosed herein, and different forms of actuating mechanism may be employed, if found desirable in practice.

I claim—

1. A system for discharging material from a plurality of rows of tiers of receptacles, provided with means for excavating the upper receptacle, a traveling device for distributing within the subjoined receptacle the material discharged therein from said upper receptacle, means for excavating said subjoined receptacle, and mechanism for actuating the parts.

2. A system for discharging material from a plurality of rows of tiers of receptacles,

provided with means for discharging material from the superimposed receptacle; a device constructed to receive the material discharged from said superimposed receptacle and distribute the same uniformly within a subjoined receptacle and mechanism for alternately actuating said means and for operating said device.

3. A system for discharging material from tiers of receptacles, provided with traveling means for discharging material from the upper receptacle, a traveling device constructed to receive the material so discharged and distribute the same within a subjoined receptacle, separate means for discharging from the subjoined receptacle the material discharged therein, a conveyer to transport the material discharged from the subjoined receptacle and mechanism for actuating the parts.

4. A system for discharging material from tiers of receptacles, provided with traveling means to excavate the superimposed receptacle, a traveling device receiving the material discharged from the superimposed receptacle and distributing the same within a subjoined receptacle, means for excavating the subjoined receptacle, and mechanism for actuating said parts.

5. A system for discharging material from tiers of receptacles, provided with a structure constructed to travel above the uppermost receptacle, means supported from said structure to excavate the superimposed receptacle, a traveling device constructed to receive the material discharged from said superimposed receptacle and distribute the same within the subjoined receptacle and mechanism for actuating the parts.

6. A system for discharging material from tiers of receptacles, provided with a structure constructed to travel above the uppermost receptacle, traveling means to discharge material through the center of the superimposed receptacle, a device to receive the material discharged from the superimposed receptacle and distribute the same in the subjoined receptacle and mechanism for actuating the parts.

7. A system for discharging material provided with traveling means for excavating an uppermost receptacle, traveling apparatus for excavating a lower receptacle, a device for operating said means and apparatus and mechanism for operating the parts.

8. A system for discharging material from rows of tiers of receptacles, provided with traveling means for discharging material from a superimposed receptacle, a device constructed to receive said discharged material and distribute the same within a subjoined receptacle, and mechanism for actuating the parts.

9. A system for discharging material from tiers of receptacles, provided with a shaft, means carried by said shaft for discharging

material from the superimposed receptacle; a device constructed to receive said discharged material and distribute the same within a subjoined receptacle, an attachment operated by said shaft to discharge the material from the said subjoined receptacle, a conveyer receiving the material discharged from said subjoined receptacle and mechanism for actuating the parts.

10. A system for discharging material from tiers of receptacles, provided with a shaft, means carried thereby to discharge the material from the superimposed receptacle, an attachment upon said shaft operated thereby alternately with said means to discharge material from a subjoined receptacle, a conveyer to transport material discharged from said subjoined receptacle and mechanism for actuating the parts.

11. A system of the general character described provided with a row of tiers of receptacles, a traveling structure means carried thereby to discharge the material from the upper and lower receptacle and mechanism for operating the parts.

12. A system of the general character described provided with a traveling structure means, operated therefrom to discharge the contents of the upper and lower receptacles of each tier, a device for distributing the material discharged from the upper receptacle into a lower receptacle and mechanism for actuating the parts.

13. A system of the general character described provided with a traveling structure independent means supported therefrom to discharge the contents of an upper and lower receptacle of each tier, a traveling device distributing within the lower receptacle the material received from the upper receptacle, a conveyer to transport the material discharged from the lower receptacle and mechanism for actuating the parts.

14. A system of the general character described provided with a traveling structure carrying a shaft, an excavator thereon constructed to discharge the material from the upper receptacle of each tier, another excavator operated by said shaft to discharge the material from the lower receptacle and mechanism for operating the parts.

15. A system of the general character described provided with a traveling structure carrying a shaft, an excavator thereon constructed to discharge the material from the upper receptacle of each tier, another excavator operated by said shaft to discharge the material from the lower receptacle, a conveyer to transport the material discharged from the lower receptacle and mechanism for actuating the parts.

16. A system for discharging material from tiers of receptacles, provided with a traveling structure, a shaft carried thereby, an excavator slidable on said shaft and ro-

tated thereby and means for supporting said excavator contiguous to said structure when not in use.

17. A system for discharging material from tiers of receptacles, provided with a traveling structure, a shaft carried thereby, an excavator feathered on said shaft, means for rotating said shaft and excavator and for elevating said shaft and excavator devices upon said structure constructed to engage and support said excavator in an inoperative position.

18. A system of the general character described provided with a supporting structure carrying a shaft, an excavator feathered thereon, means for rotating said shaft to operate said excavator and to raise said shaft to bring said excavator into an inoperative position, another excavator operated by said shaft and mechanism for actuating the parts.

19. A system of the general character described provided with a supporting structure carrying a shaft, an excavator thereon, means for operating and supporting said excavator in an inoperative position another excavator operated by said shaft when the first excavator is in said position and devices for supporting the second excavator while the first excavator is in operation.

20. A system of the general character described provided with upper and lower receptacles, a traveling structure carrying a shaft, an excavator on said shaft operated thereby and elevated into inoperative position by said shaft, a distributor receiving the material excavated from the upper receptacle and discharging the same into the lower receptacle, a second excavator in the lower receptacle operated and elevated into inoperative position by said shaft and mechanism for actuating the parts.

21. A system of the general character described provided with an upper and lower receptacle, a traveling structure, an excavator operated and supported in inoperative position therefrom, a distributor receiving the excavated material from the upper receptacle and discharging the same into the lower receptacle, a second excavator likewise operated from said structure, an endless conveyer to transport the material from said lower receptacle and mechanism for actuating the parts.

22. A system of the general character described provided with a supporting structure carrying a slidable shaft, mechanism on said structure for elevating and lowering said shaft an excavator on the shaft operated thereby and elevated into inoperative position by said shaft and a second excavator detachably connected with said shaft and likewise operated thereby.

23. A system of the general character described provided with a supporting structure carrying a slidable shaft, mechanism on said structure for automatically raising and lowering said shaft, an excavator operated thereby and elevated into inoperative position by said shaft and a second excavator likewise operated by said shaft.

24. A system of the general character described provided with a traveling supporting structure carrying a slidable shaft, mechanism for raising and lowering said shaft, an excavator thereon operated thereby, a traveling excavator and means for detachably connecting the said shaft and traveling excavator to operate the latter when the first excavator is not in operation.

25. A system for discharging material from tiers of receptacles, provided with a traveling excavator for the lower receptacle and means for operating said excavator to discharge the contents of the lower receptacle while the upper receptacle is in use.

26. A system of the general character described provided with an upper and lower receptacle, the former having a central opening surrounded by a water-tight sleeve, an upper and lower excavator, and means passing through said sleeve to operate the lower excavator and mechanism for actuating the parts.

27. A system of the general character described provided with an upper and lower receptacle the former having an opening surrounded by a removable sleeve, an upper and lower excavator, means passing through said sleeve to operate said excavators and mechanism for actuating the parts.

28. A system of the general character described provided with an upper and lower receptacle the former having an opening surrounded by a sleeve, a traveling structure carrying a shaft passing through said sleeve, an upper and lower excavator operated by said shaft and mechanism for actuating the parts.

29. A system of the general character described provided with an upper and lower receptacle the former having an opening surrounded by a removable sleeve, a supporting structure carrying a shaft passing through said sleeve, an upper and lower excavator operated by said shaft and mechanism for actuating the parts.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, in the county of Los Angeles and State of California, this 11th day of October, 1902.

HIRAM W. BLAISDELL.

Witnesses:

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L. B. ALDERETE.