

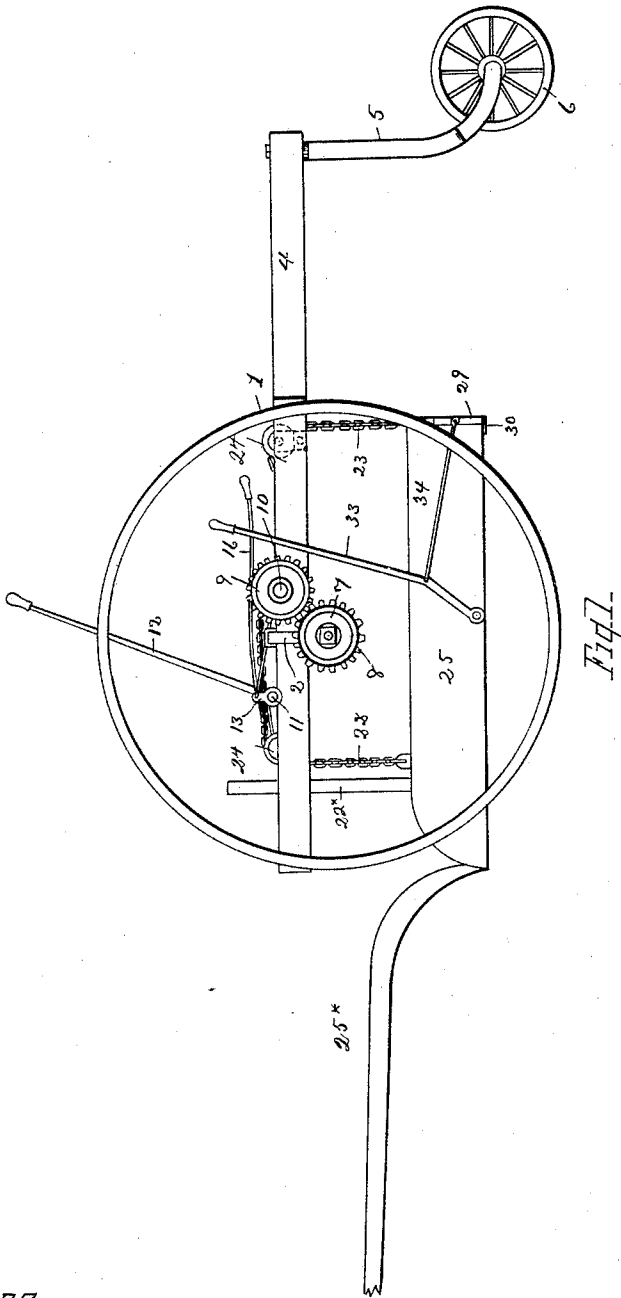
(No Model.)

2 Sheets—Sheet 1.

B. F. JOHNSON.
EARTH EXCAVATOR.

No. 468,393.

Patented Feb. 9, 1892.



WITNESSES

James M. Reed
Lyman S. Smith

INVENTOR

Benjamin F. Johnson.
by E. B. Stocking
Att'y.

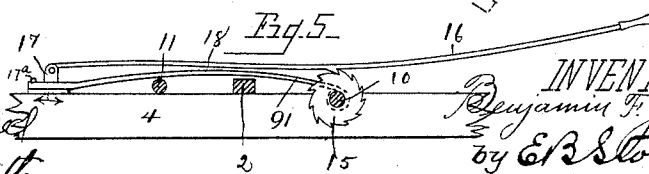
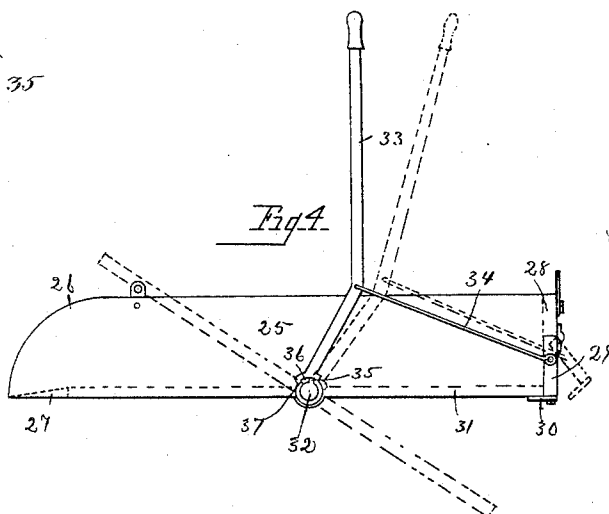
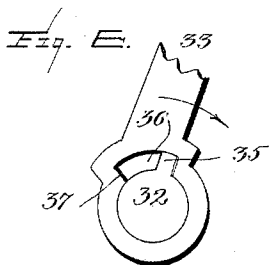
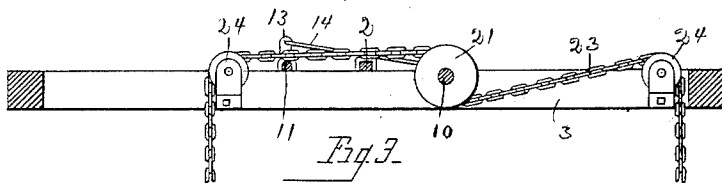
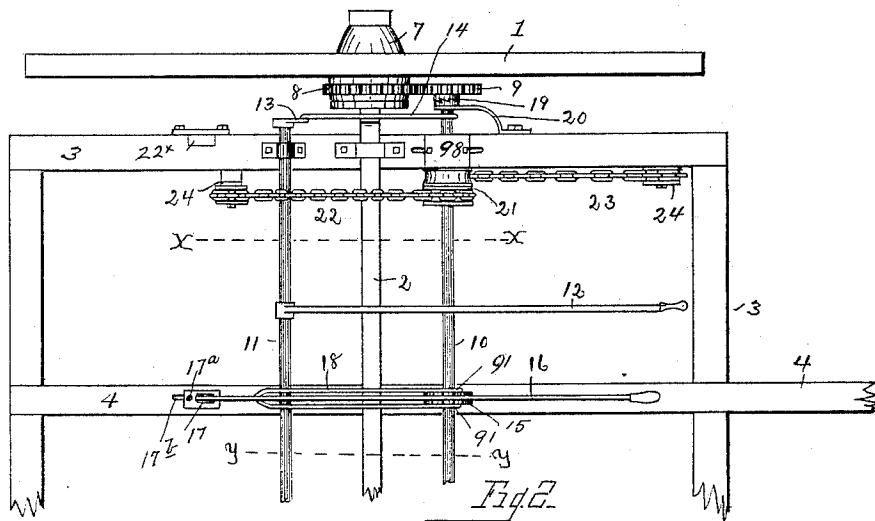
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UNITED STATES PATENT OFFICE.

BENJAMIN F. JOHNSON, OF MANSFIELD, OHIO.

EARTH-EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 468,393, dated February 9, 1892.

Application filed December 11, 1890. Serial No. 374,340. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. JOHNSON, a citizen of the United States, residing at No. 8 East Market street, Mansfield, in the county of Richland, State of Ohio, have invented certain new and useful Improvements in Earth-Excavators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to earth-excavators, having particular relation to that class of such devices in which a scoop or scraper is suspended upon an axle mounted upon wheels.

The objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation of a complete scraper, the spokes of the wheels being omitted to disclose the parts suspended from the axle, showing the scraper in a partially-raised position. Fig. 2 is a plan view of one side of the device. Fig. 3 is a section on the line x x , Fig. 2, illustrating the pulleys and chains by which the scraper is suspended. Fig. 4 is a side view of the scraper, illustrating the release of the end-gate and incline of the bottom of the scraper, the bottom being shown in this inclined position in dotted lines. Fig. 5 is a section on line y y , Fig. 2, showing the sliding pawl for holding the scraper in its raised position. Fig. 6 is a detail on an enlarged scale.

I will now proceed to describe the parts in detail, it being understood that like numerals of reference refer to like parts throughout the several figures of the drawings.

1 designates the wheels, which are journaled on the fixed axle 2, from which is suspended the rectangular frame 3, having a projecting sill 4, in which is journaled a standard 5, carrying a caster-wheel 6. Upon the hub 7 of each wheel is secured a pinion 8. These are adapted to intermesh with like pinions 9, journaled upon a counter-shaft 10, journaled in movable boxes 98, secured upon the frame 3 and parallel with the axle 2.

11 designates a shaft journaled in front of

and parallel with the shafts 2 and 10 and provided with a lever 12, by which it may be given a partial revolution, thereby actuating the cranks 13, secured upon each end thereof, and which are connected to the counter-shaft 10 through the medium of a rod 14. This construction enables the operator to throw the pinions 9 into or out of mesh with the pinions 8.

15 designates a ratchet-wheel secured upon the shaft 10 centrally of its length, which engages a pawl-lever 16, hinged to the standards 17, movable upon the frame 4, there being a bifurcated rod 18 secured to the standard and having a hooked end 91, which engages with the shaft 10, thereby causing the pawl-lever to move in unison with the shaft 10 when this is actuated by the lever 12, shaft 11, crank-arm 13, and connecting-rod 14 to move the shaft 10 to throw the pinions 9 into or out of engagement with the pinions 8 upon the wheel-hub. The standards may be movable upon the frame in any suitable manner—as, for instance, by a set-screw 17^a, designed to work in the slot 17^b in the sill 4. The boxes 98 may be rendered movable in the same manner. (See Fig. 2.)

19 designates a clutch movable upon the shaft 10, the clutch-faces of which are held normally in engagement by a spring 20, the object of these clutches being to allow one pinion 9 to revolve idly upon the shaft 10 while the wheel opposite is revolving when turning the scraper upon a curve.

21 designates a pair of drums secured upon the shaft 10, to which are attached chains 22 and 23. The chain 22 is secured at the opposite end to the front end of the scraper, the chain 23 being secured to the rear end of the same, each chain being led over an idler 24, journaled upon the frame and placed at a distance from the shaft 10 to cause the chain to depend vertically therefrom and balance the scraper when suspended.

25 designates the scraper connected with the main frame by chains 22 and 23, as has been described, and formed with sides 26, a cutting-end 27, connected therewith either integrally or removably, as desired, and a rear end portion 28, fixedly attached to the sides. The end 28 extends from the top of the sides to approximately one-half the width

thereof, and has hinged thereto a swinging portion 29, having a plate 30, adapted to swing beneath the scraper and support a swinging bottom 31, secured centrally of its length to a transverse rod 32, journaled in the sides of the scraper.

33 designates a lever connected with the swinging end board 29 by means of a rod 34, which, when the lever is thrown back, urges the swinging end board 29 open, thereby withdrawing the plate 30 from beneath the bottom 31, which then swings to an incline relatively to the body of the scraper to cause it to dump its load.

The arrangement for causing a partial revolution of the rod 32 to cause the bottom to incline is as follows: Upon the end of the rod 32 is formed a lug 35, projecting from the upper side thereof. This rests in a recess 36, formed in the end of the lever 33, the recess being of a length to allow the lever to be moved sufficiently to cause the rod 34 to open the swinging end board 29, after which a further movement of the lever causes the wall 37 of the recess 36 to strike the lug and revolve the rod 34 sufficiently to cause the bottom of the scraper to incline and dump the load.

It will be understood that the plan in Fig. 2 shows but one side of the machine. The mechanism on the other side is a duplicate thereof. (See Fig. 1.) The draft appliance 25^x is attached to the forward end of the scoop or scraper. The vertical arm 22^x serves to prevent sidewise and forward movement of the scoop.

In operation the scraper is drawn forward until full, when the lever 12 is moved to cause the rods 14 to move the shaft 10 a sufficient distance to bring the pinions 9 into engagement with the gear 8, the forward movement of the device thereby revolving the drums 21 and winding the chains 22 and 23 thereon, and consequently raising the loaded scraper, which is held in its elevated position by the catch-lever 16, when the load may be transported to the desired place of deposit. When it is desired to dump the load, the lever 33 is moved to cause the rod 34 to swing the board 29. A further movement of the same lever 33 will cause the rod 32 to revolve sufficiently to incline the bottom and allow the load to slide therefrom.

Various modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

The hinged tail-piece is important. It serves, in addition to supporting the bottom, to permit the ready exit of the load from the scoop or scraper.

What I claim as new is—

1. The combination, with the frame and axle, of a scraper suspended therefrom and provided with a pivoted bottom, the hinged end piece engaging the said bottom, and means

for actuating said end piece to release the bottom, as set forth.

2. The combination, with the suspended scraper having pivoted bottom and a cutting forward end, of the hinged rear end piece to the scraper engaging and supporting the bottom and the lever fulcrumed on the scraper and connected with the end piece, substantially as specified.

3. The combination, with the suspended scraper having pivoted bottom and hinged rear end piece engaging and supporting the bottom, of the lever fulcrumed on the rod by which the said bottom is pivoted, said lever being connected with the end piece, and provisions for causing only a partial rotation of said rod, substantially as specified.

4. The combination, with the suspended scraper having a pivoted bottom, of the rod by which the said bottom is pivoted, having a lug, the lever having a recess to receive said lug, the hinged end piece engaging and supporting the bottom, and the connection between the end piece and the lever, substantially as and for the purpose specified.

5. The combination, with the suspended scraper having a pivoted bottom, of the rod by which the bottom is pivoted, formed with a lug, and the lever provided with a recess to receive the lug, substantially as specified.

6. In an earth-excavator, a suspended scraper provided with sides, a forward cutting-edge, a pivoted bottom, and a hinged rear end piece adapted to engage and hold the bottom closed, as set forth.

7. In an earth-excavator, a suspended scraper provided with sides and forward cutting-edges, a rear hinged end piece, a pivoted bottom normally held up by the said end piece, and a connection between the pivot of the bottom and the hinged end piece, substantially as and for the purpose specified.

8. In an earth-excavator, a suspended scraper provided with a pivoted bottom, a hinged rear end piece adapted, normally, to hold the bottom up, a lever adapted for rocking the bottom on its pivot and connected with the end piece, and provisions for allowing only a partial rotation of the pivot of the said bottom, substantially as specified.

9. The combination, with the drum-shaft and the shaft 11, parallel therewith, and connections between said shafts, of a ratchet-wheel on the drum-shaft, a pawl-lever fulcrumed on a movable standard on the frame, the lever 12 on the shaft 11, and the bifurcated rod secured to the said standard and engaging the drum-shaft, substantially as and for the purpose specified.

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

BENJAMIN F. JOHNSON.

Witnesses:

L. S. SMITH,

S. S. BRICKER.