

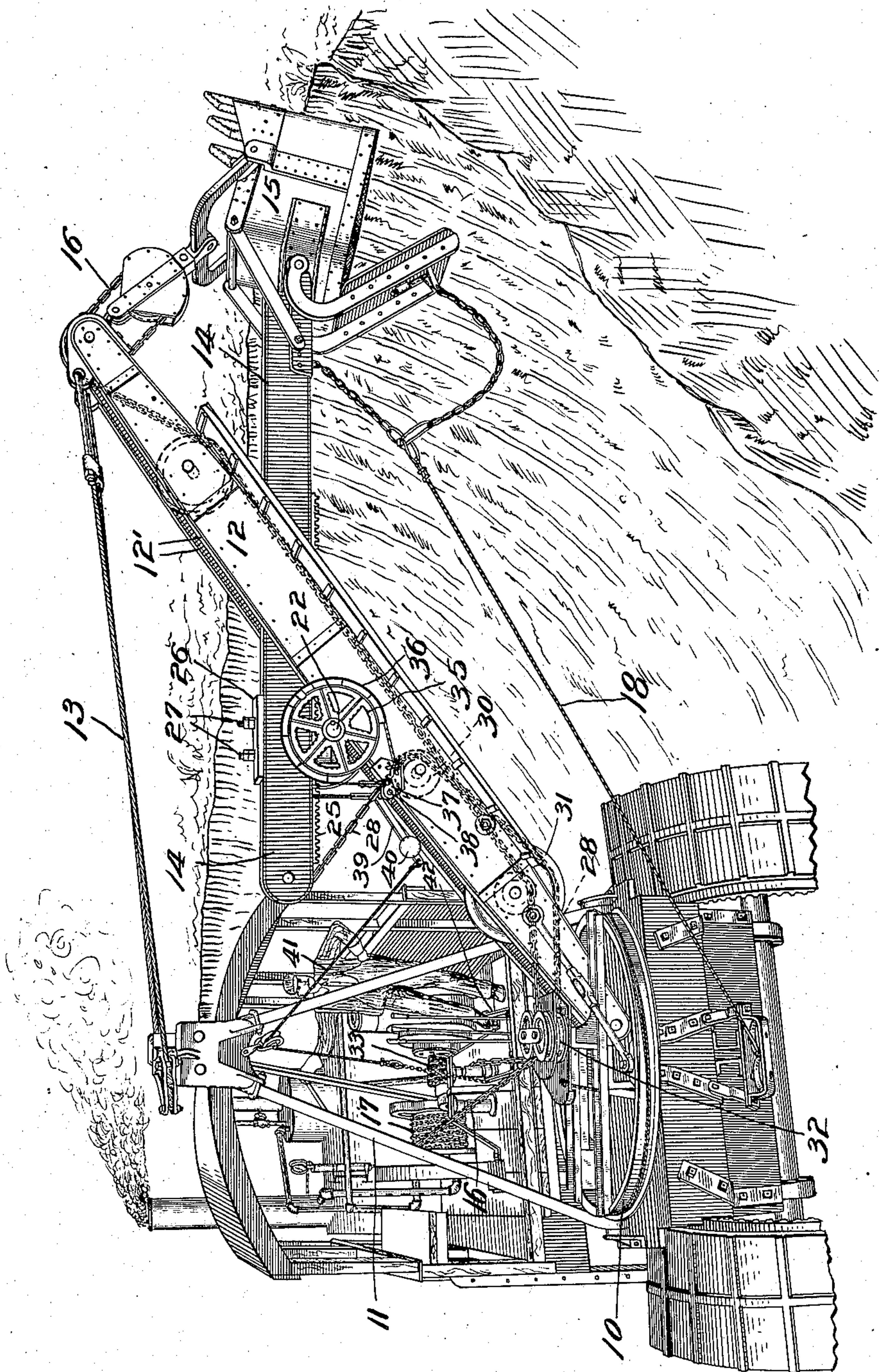
No. 881,695.

F. E. KERSEY.
POWER EXCAVATOR.
APPLICATION FILED SEPT. 25, 1907.

PATENTED MAR. 10, 1908.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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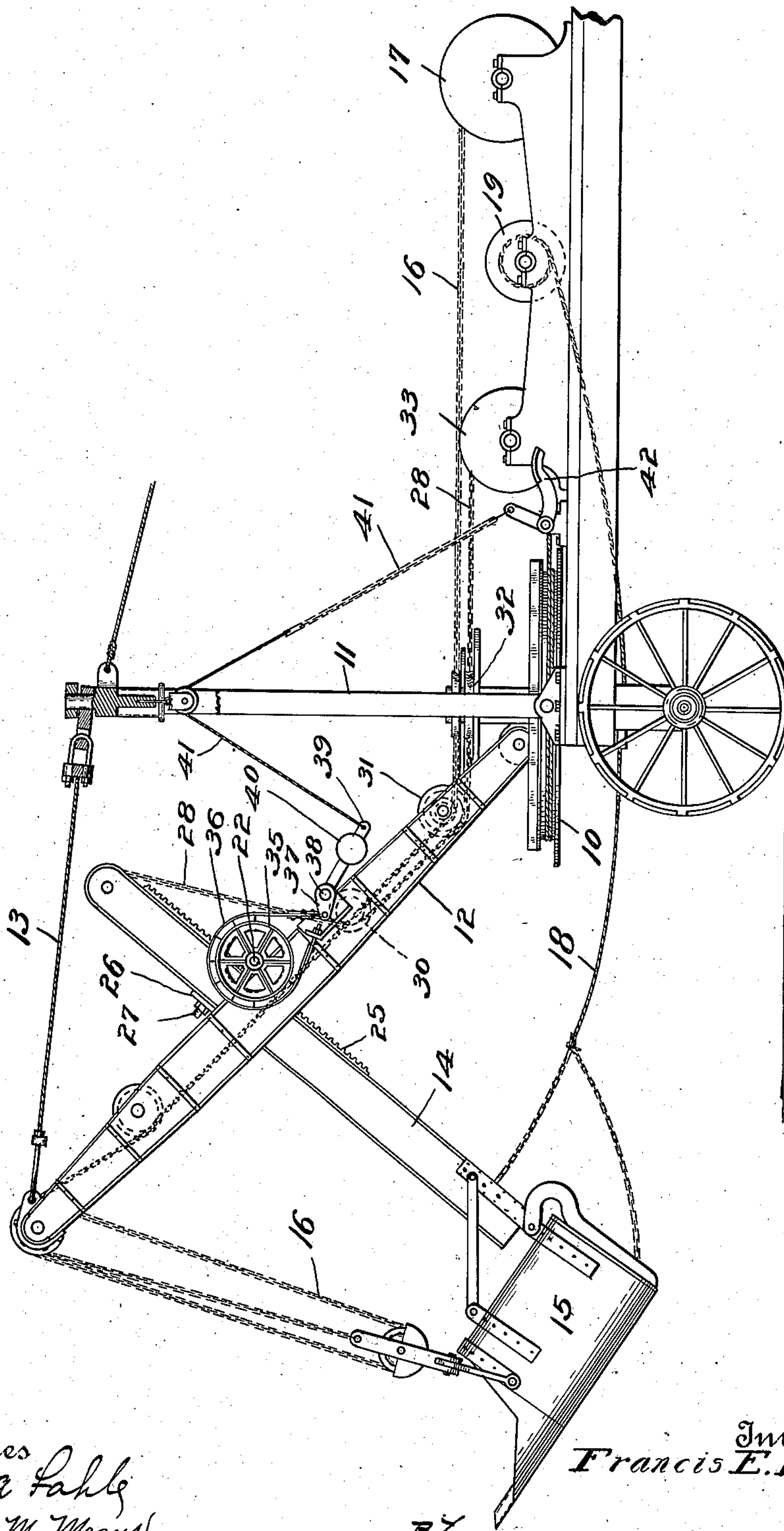
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3 SHEETS—SHEET 2.

Fig. 2.



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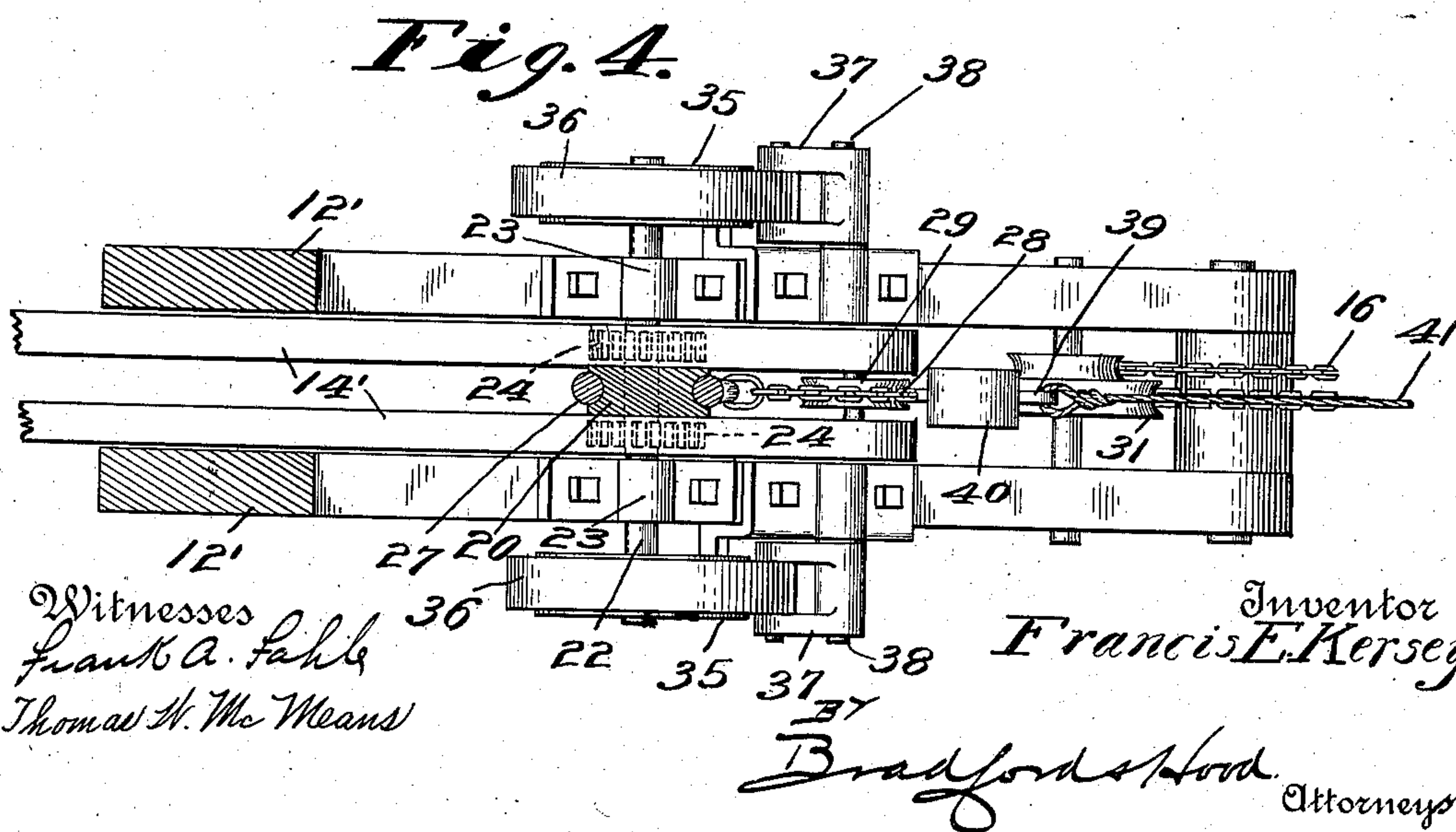
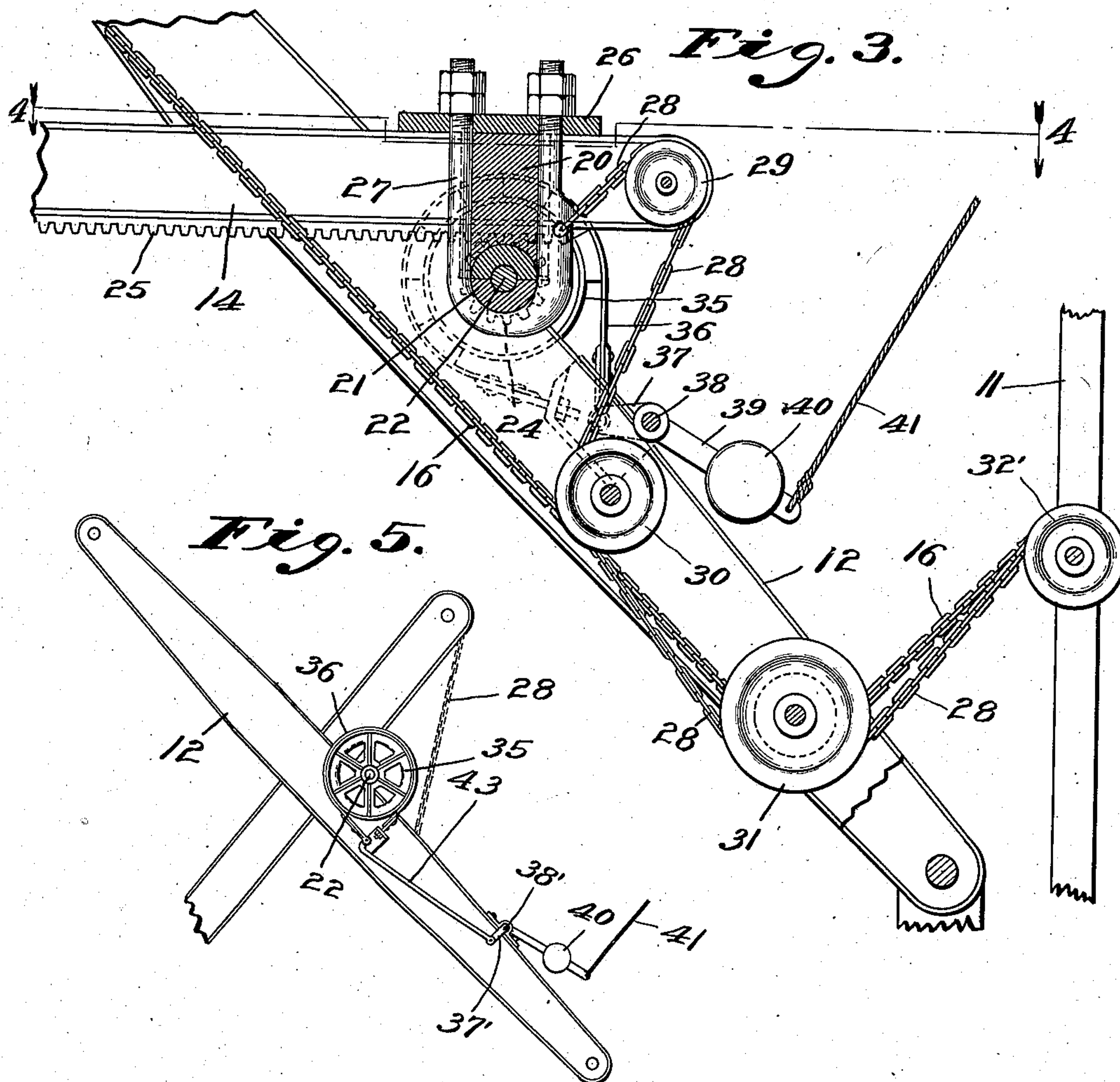
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

FRANCIS E. KERSEY, OF CINCINNATI, OHIO.

POWER-EXCAVATOR.

No. 881,695.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed September 25, 1907. Serial No. 394,445.

To all whom it may concern:

Be it known that I, FRANCIS E. KERSEY, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Power-Excavators, of which the following is a specification.

The object of my invention is to provide, in an excavator of the dipper type, a means for crowding the dipper down to its work in such manner that there will be a simultaneous crowding and lifting action.

A further object of my invention is to provide such improvements in details of construction as will hereinafter be pointed out.

The accompanying drawings illustrate my invention:

Figure 1 is a perspective view of an excavator embodying my invention; Fig. 2 a side elevation of another excavator embodying the same invention with some modifications in details of construction and arrangement; Fig. 3 a detail of the dipper arm support, the brake, and my improved means for crowding the dipper down to its work; Fig. 4 a section on line 4—4 of Fig. 3; and Fig. 5 a slight modification of the brake.

In the drawings, 10 indicates the usual turntable provided with a mast 11. Pivoted upon the turntable 10, is the vertically swinging boom 12 which may have its pivot below the plane of the turntable, as shown in Fig. 1, or above the plane of the turntable, as shown in Fig. 2, the outer end of the boom being supported in any desirable position by suitable cables 13. The dipper arm 14 is provided at its lower end with any suitable form of dipper 15, which is connected by a lifting tackle comprising chain 16, with a winding drum 17 operated in the usual well known manner. The lower end of the dipper arm 14 is also connected by a cable 18 with a winding drum 19 so that it may be drawn downward and inward, in the usual well known manner.

The boom 12 is conveniently formed of two parallel members 12' 12' (see Fig. 4) between which the dipper arm is projected and by which said dipper arm is held in the plane of the boom. The dipper arm may also be conveniently formed of two parallel members 14' 14' between which is arranged a pivot block 20 provided with suitable journal bearing 21 by means of which the block is pivotally mounted upon shaft 22 journaled

in suitable bearings 23 on the boom 12. Shaft 22 is provided with a pair of pinions 24 (shown in dotted lines in Figs. 3 and 4) each of which meshes with a rack 25 secured to the lower face of the upper end of each dipper-arm-member 14'. The racks are held in mesh with their pinions by means of a plate 26 secured to the upper face of block 20 and extended over the dipper arm members 14'. In order to hold the plate 26 in place, and the bearing member 21 in position, I provide a U-bolt 27, as clearly shown in Fig. 3. Secured to U-bolt 27 is one end of a chain 28 and this chain is passed upwardly over an idler 29 journaled at the inner upper end of the dipper arm 14, passing from thence downwardly beneath an idler 30 journaled in the boom 12, thence under an idler 31 also journaled in boom 12 near its inner lower end, and thence between idlers 32 on the turntable (see Figs. 1 and 2), or over an idler 32' journaled in the turntable (see Fig. 3) to a winding drum 33 driven in any suitable manner.

Secured to each end of shaft 22, is a brake wheel 35 over which passes a brake-band 36, one end of said brake-band being attached to a stationary member on boom 12, while the other end is attached to an arm 37 carried by rock-shaft 38. Rock-shaft 38 is also provided with an operating arm 39 having a counter weight 40 which normally tends to release the brake, and arm 39 is connected by a cable 41 with a suitable operating treadle 42.

In Fig. 5 a slight modification of the brake is shown in that the arm 37' of the rock-shaft 38' is connected to the brake-band by means of a lever 43 instead of being directly connected to one end of the brake band.

In operation, the boom 12 is set at any desired angle in the usual manner and, through cable 18, the dipper is drawn down to starting position. Drum 17 is then manipulated so that cable 16 will tend to draw dipper 15 upward against the dirt and at the same time drum 33 is manipulated so as to draw upon chain 28 and this chain, acting upon the inner, upper end of the dipper arm 14, not only serves to project it downward through the boom 12 but also operates in the same direction as cable 16, so as to keep the dipper to its work. The crowding action of chain 28 may be stopped at any point and the dipper arm then held against lengthwise displacement, during further lifting by the cable

16, by means of the brake bands 36, which, operating upon wheels 35, serve to hold shaft 22 against rotation so that thereafter the racks 25 of the dipper arm 14 will roll upon their pinions. By this construction I am enabled to give to the dipper a crowding, digging action which cannot be produced by a mere longitudinal crowding movement of the dipper arm, as is the case in the ordinary type of construction wherein a small engine is mounted upon a boom and connected by suitable gearing with the dipper arm so as to project the same longitudinally. By my construction also the small engine heretofore commonly used on the boom becomes unnecessary. The lever 42 is arranged near the drums 17, 19 and 33 so that the entire digging operation is under the control of a single operator. As a consequence, the services of a "cranesman" (now necessary in the main boom of present construction) are dispensed with.

I claim as my invention:

1. In an excavator, the combination with a supporting member, of a dipper arm carried thereby and longitudinally movable with relation thereto, lifting mechanism for the outer end of the dipper arm, and a crowding means acting on the upper end of the dipper arm to project said dipper arm both longitudinally and angularly, the angular movement being in the direction to move upwardly the dipper end of the arm, said crowding means comprising a sliding pivotal connection with the dipper arm and a cable running therefrom over suitable sheaves to a winding drum.

2. In an excavator, the combination, with a supporting member, of a dipper arm mounted thereon, means for lifting the dipper end of said arm, a sliding pivotal support for said dipper arm, and a cable engaging the opposite end of the dipper arm beyond the pivot in a direction tending to project the dipper arm longitudinally and to swing the dipper end of the arm upward.

3. In an excavator, the combination, with a suitable support, of a dipper arm mounted thereon by a sliding pivotal connection, and a pulling cable engaging the inner end of the dipper arm and passing thence over a guide below the dipper arm and forward of the inner end thereof.

4. In an excavator, the combination, with a supporting member, of a dipper arm carried thereby and longitudinally movable with relation thereto, lifting mechanism for the outer end of the dipper arm, and a crowding means acting on the upper end of the dipper arm to project said dipper arm longitudinally and angularly, the angular movement being in the direction of the lifting of the dipper end of the arm, and means for

holding the dipper arm against longitudinal movement.

5. In an excavator, the combination, with a supporting member, of a dipper arm mounted thereon, means for lifting the dipper end of said arm, a sliding pivotal support for said dipper arm, a cable engaging the opposite end of the dipper arm beyond the pivot in a direction tending to project the dipper arm longitudinally and to swing the dipper end of the arm upward, and means for holding the dipper arm against longitudinal movement.

6. In an excavator, the combination, with a suitable support, of a dipper arm mounted thereon by a sliding pivotal connection, a cable engaging the inner end of the dipper arm and passing thence over a guide below the dipper arm and forward of the inner end thereof, and means for holding the dipper arm against longitudinal movement.

7. In an excavator, the combination, with a supporting boom, of a shaft journaled thereon, a pinion carried by said shaft, a dipper arm having a sliding pivotal engagement with said shaft, a rack carried by the dipper arm and engaging with said pinion, lifting means for the dipper end of the arm, and means for engaging the inner end of the dipper arm to pull the same downward and forward.

8. In an excavator, the combination, with a supporting boom, of a shaft journaled thereon, a pinion carried by said shaft, a dipper arm having a sliding pivotal engagement with said shaft, a rack carried by the dipper arm and engaging with said pinion, lifting means for the dipper end of the arm, and a cable engaging the inner end of the dipper arm and passing thence over a guide below and forward of the inner end of the dipper arm.

9. In an excavator, the combination, with a supporting boom, of a shaft journaled thereon, a pinion carried by said shaft, a dipper arm having a sliding pivotal engagement with said shaft, a rack carried by the dipper arm and engaging with said pinion, lifting means for the dipper end of the arm, and a cable attached at one end to the pivotal support of the dipper arm, passing thence over an idler at the inner end of the dipper arm, thence downwardly and forwardly, and thence to suitable pulling mechanism.

In witness whereof, I, have hereunto set my hand and seal at Indianapolis, Indiana, this twenty-third day of September, A. D. one thousand nine hundred and seven.

FRANCIS E. KERSEY. [L. s.]

Witnesses:

ARTHUR M. HOOD,
THOMAS W. McMEANS.