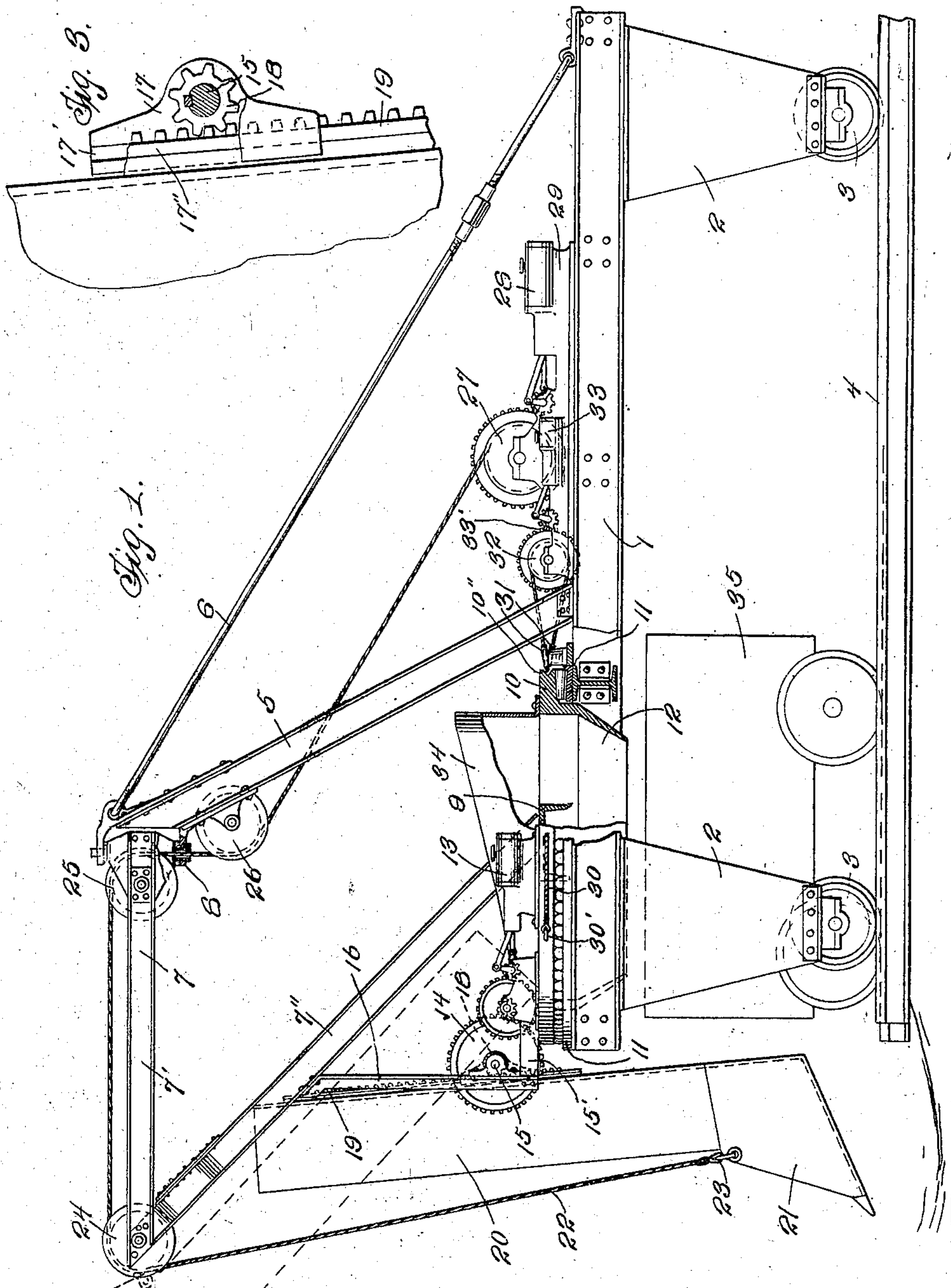


F. DONALDSON.  
EXCAVATING MACHINE.  
APPLICATION FILED AUG. 4, 1910.

996,913.

Patented July 4, 1911.

3 SHEETS-SHEET 1.



Witnesses:  
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*C. A. Humphries*

Inventor  
*Francis Donaldson*  
By his Attorney *T. H. Gibbs*

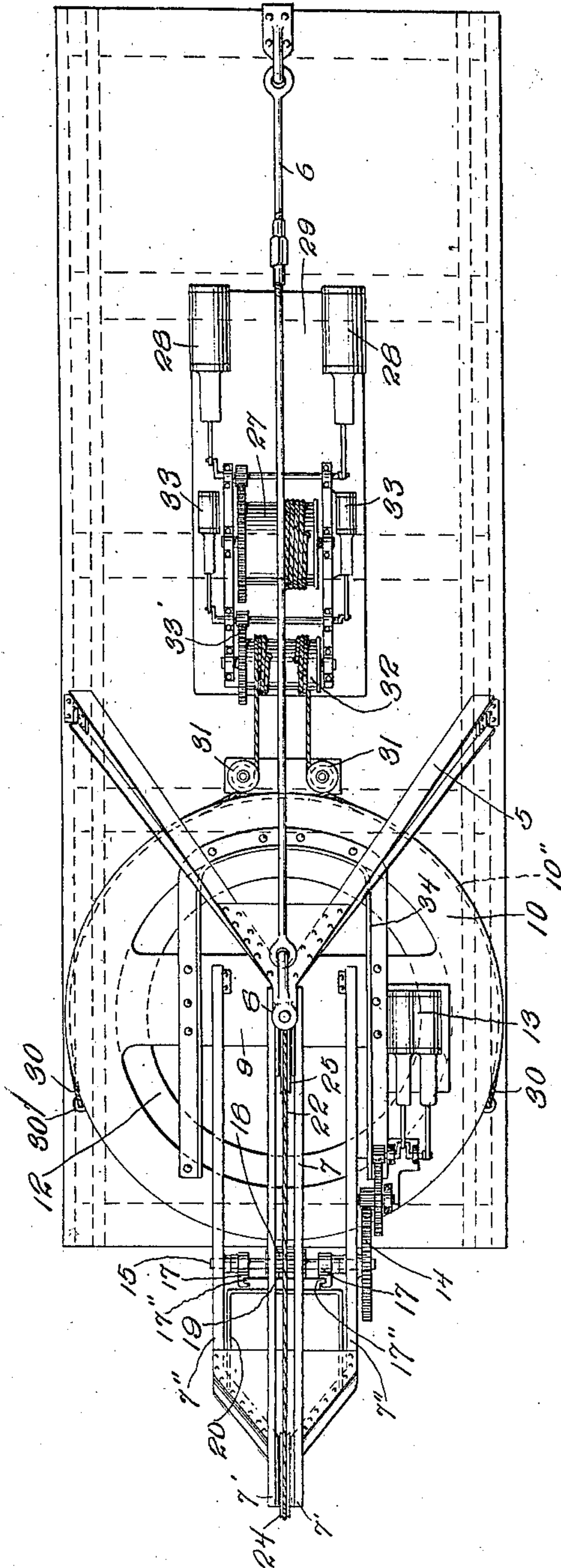
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3 SHEETS—SHEET 2.

Fig. 2.



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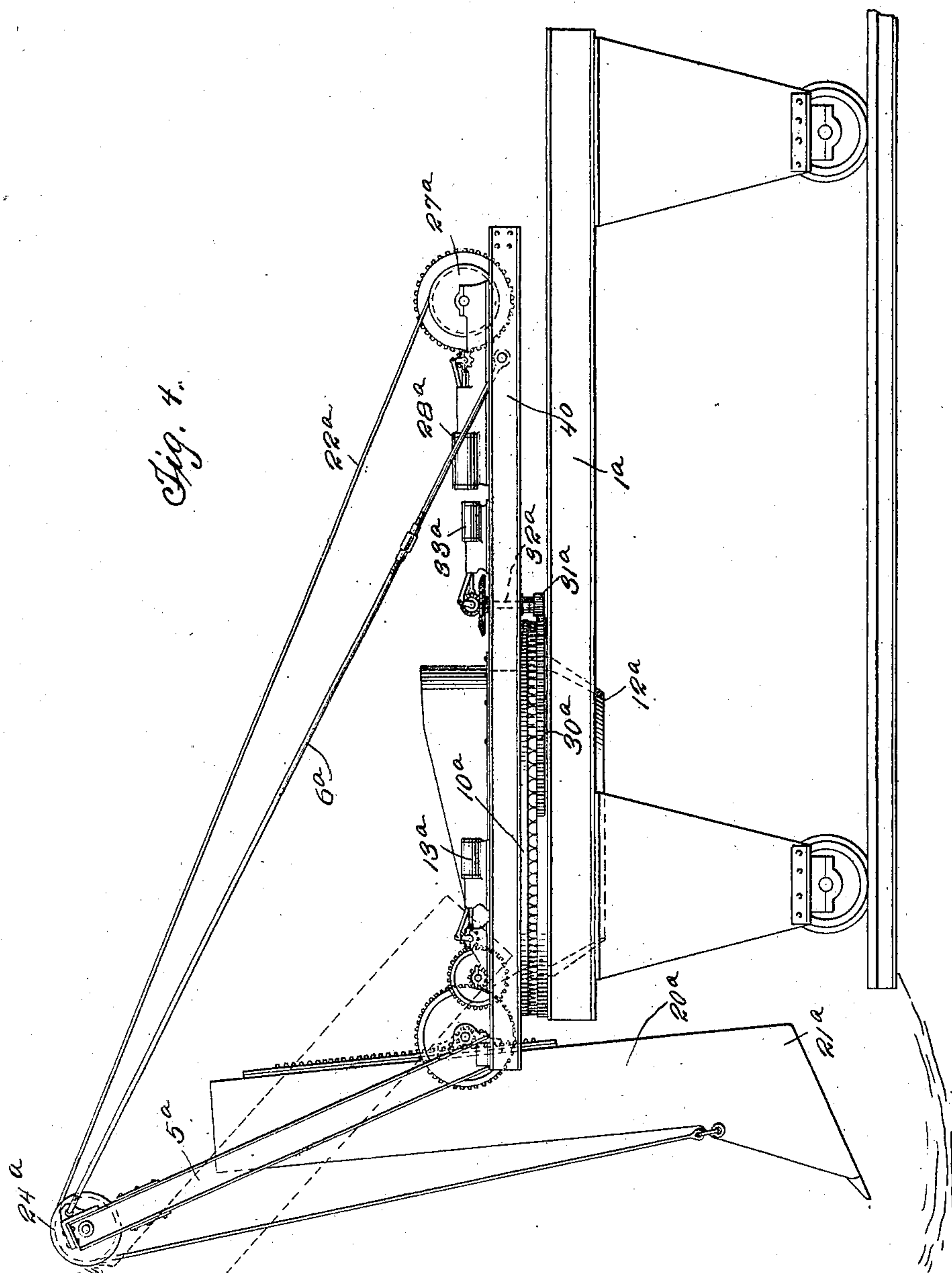
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WITNESSES

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# UNITED STATES PATENT OFFICE.

FRANCIS DONALDSON, OF YONKERS, NEW YORK.

## EXCAVATING-MACHINE.

996,913.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed August 4, 1910. Serial No. 575,606.

*To all whom it may concern:*

Be it known that I, FRANCIS DONALDSON, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Excavating-Machines, of which the following is a specification.

My invention relates broadly to excavating machines, and more specifically to a type of excavating machine which is carried upon a wagon or railway truck.

The principal object of my invention is an excavating machine constructed in such manner that the excavating scoop is provided with an attached chute which is mounted upon a turn table that is provided with an opening, the construction of parts being such that the scoop is adapted to discharge its contents through the opening in the turn table into a receptacle therebeneath.

Another object of my invention is an excavating machine in which an integral scoop and chute is pivotally mounted upon a turn table which is provided with an opening, the construction and arrangement of parts being such that the scoop and chute may be controlled by a single movement, which movement both loads and empties the scoop.

Other and further objects of my invention will in part be obvious and will in part be pointed out in the specification hereinafter following, and the scope of the invention will be indicated by the appended claims.

Throughout the several figures of the drawings, like characters are used to represent like parts.

Figure 1 is a view in side elevation of an excavating mechanism embodying the features of the invention. Fig. 2 is a top plan view thereof. Fig. 3 is an enlarged detail fragmentary view of the chute guide and actuating pinion. Fig. 4 is a view similar to Fig. 1, illustrating a modified embodiment.

Referring to the drawings by numerals, 1 indicates a supporting frame provided with wheel pedestals 2 and wheels 3, which wheels are mounted to travel upon track 4. An A frame 5 is fixed to and upstands from frame 1. The A frame is engaged at its upper end by stay 6 anchored to the rear end of the frame 1. A crane 7 is pivotally supported by the upper end of the frame 5 and comprises a pair of horizontal members 7' fixed at their rear end to a hollow journal 8,

the front end of the member 7' being engaged by inclined supporting beams 7'' which beams are spread apart just beneath their engagement with the members 7' and extend downwardly and are fixed to a cross member 9 of a turn table 10. The turn table 10 is rotatably mounted preferably upon suitable roller bearings sustained in an annular journal guide 11 fixed to the frame 1. The turn table 10 consists, as clearly shown in Fig. 2, of a ring with the cross member 9 formed integral therewith and leaving front and rear open spaces communicating with an annular discharge hopper 12. Fixed to the turn table 10 is the bed plate of a suitable engine 13 geared to drive a gear wheel 14 fixed to shaft 15. The shaft 15 is journaled in suitable bearings fixed to standards 16 depending from the supporting beams 7'' and connected at their lower ends to a sub-frame 15', fixed to the turn table 10. The shaft 15 extends loosely through a pair of suitable guide plates 17. A pinion 18 is fixed to the shaft 15, between the guide plates 17, and is arranged to mesh with a rack 19 fixed to and extending longitudinally of the bottom of a chute 20, which chute serves as a beam for the ordinary scoop or shovel 21 which is fixed to the end thereof. Each guide plate 17 is formed with a longitudinal guiding groove 17' and the rack 19 is formed with lateral flanges 17'' projecting into the grooves 17' and serving as guiding and retaining means for the chute for allowing free longitudinal reciprocation of said rack and chute.

A cable 22 is fixed by a suitable pivotally mounted bail 23 to the scoop 21 and extends upwardly over a sheave 24 journaled in the forward end of the crane 7, and thence rearwardly over a pulley 25 journaled in the rear end of the crane and downwardly therefrom through the hollow journal 8, under a pulley 26 journaled in brackets fixed to the frame 1, down to the winding drum 27. The drum 27 is adapted to be actuated by a gearing driven by a suitable engine, as 28. The engine, gearing, and drum are sustained by a bed plate 29 mounted on the frame 1.

Cables 30—30 are fixed to turn table 10 at opposite sides thereof as at 30' and extend about the turn table preferably in a groove 10'' to and about rearwardly disposed guiding pulleys 31 journaled on the frame 1, and thence to an actuating drum 32. The drum 32 is driven by an engine 33 through



suitable gearing 33'. The drum, engine, and gearing are preferably mounted on the bed plate 29.

The beams 7'' are separated or spaced apart a distance sufficient for accommodating swinging and reciprocating movement of the end of the chute opposite to that fixed to the scoop 21, the chute at times extending past and between the beam 7''.

In operation, the scoop will be manipulated for taking a load after the manner of operating an ordinary dredging scoop by being first lowered and then thrust forwardly. When the scoop is loading, the engine 28 is operated, taking up the cable 22 and elevating the scoop to the position indicated in dotted lines in Fig. 1, the chute 20 swinging about shaft 15 as a pivot. As the scoop moves upwardly, the gear 14 is actuated by the engine 13 for driving the rack 19 for effecting the requisite longitudinal movement of the chute 20 so as to insure its assumption of the desired elevated position. When the chute and scoop are thus elevated, the load will be delivered by gravity from the scoop down the chute and into the hopper 12. An upstanding shield 34 is fixed to turn table 10 and extends about and on each side of the beams 7'' in position for directing the discharge from the chute into the hopper. Preferably for convenience in manipulation, a car 35 is mounted on a track of narrower gage and between the rails of the track upon which the wheels 3 are mounted so that said car may be moved freely beneath frame 1 to and from a position immediately beneath the chute hopper 12, whereby the load from the scoop 21 may be delivered directly along the chute 20, through the turn table 10, and the hopper chute 12 into the car 35. The hopper 12 may obviously be connected to turn table 10 in any desired manner, but for convenience is illustrated as an integral part therewith.

In the construction illustrated in Fig. 4, all engine is removed from the frame 1<sup>a</sup> and is mounted on the turn table, and the structural re-arrangement for attaining this positioning of the engine marks the sole difference between this embodiment and that just described. Frame 1<sup>a</sup> carries the hopper chute 12<sup>a</sup> extending downwardly from turn table 10<sup>a</sup>. A mutilated gear 30<sup>a</sup> is fixed to frame 1<sup>a</sup> coaxially with turn table 10<sup>a</sup> and meshes with a driving pinion 31<sup>a</sup> carried by a vertical drive shaft 32<sup>a</sup> and geared to be driven by engine 33<sup>a</sup>. Engine 33<sup>a</sup> is mounted on a framing 40 which extends rearwardly from and in effect forms part of the turn table 10<sup>a</sup>. The shaft 32<sup>a</sup> is journaled in framing 40 so as to cause the framing and connected parts to swing when the pinion 31 is driven and walks along the gear 30<sup>a</sup>. The A frame 5<sup>a</sup> is fixed to the framing 40 in front of the turn table and the upper end

is engaged by guys 6<sup>a</sup> fixed to framing 40 adjacent the rear end thereof. Engine 28<sup>a</sup> is mounted on framing 40 and is disposed for driving a drum 27<sup>a</sup> which engages cable 22<sup>a</sup> for manipulating the scoop 21<sup>a</sup>. The cable 22<sup>a</sup> extends forwardly and upwardly from the drum and is passed over a pulley 24<sup>a</sup> journaled in the upper end of a frame 5<sup>a</sup>. Chute 20<sup>a</sup> is identical with the chute 20 and extends between the legs of the A frame 5<sup>a</sup>. An engine 13<sup>a</sup> is sustained by framing 40 and is geared for operating the scoop and connected parts in the same manner as has been previously described.

What I claim is:

1. The combination of a turn table having an opening, excavating means, said excavating means comprising a scoop member, a chute member attached to said scoop and pivotal means mounted directly upon the turn table for manipulating the excavating means for directing the discharge from said chute directly through the turn table opening.

2. In combination, a supporting frame, a turn table mounted thereon and being formed with an opening, a chute, an excavating scoop connected with the chute and disposed for discharging therein, and means mounted directly upon the turn table for manipulating the scoop and chute to give said scoop and chute a longitudinal translatable movement to direct the discharge from the scoop through the chute and through the opening in the turn table.

3. In combination, a supporting frame, a turn table mounted thereon and being formed with an opening, a chute, an excavating scoop connected with the chute and disposed for discharging therein, means mounted directly upon the turn table for manipulating the scoop and chute to give said scoop and chute a longitudinal translatable movement to direct the discharge from the scoop through the chute and through the opening in the turn table, and means for rotating said turn table.

4. In combination, a supporting frame, a turn table mounted thereon and being formed with an opening, a chute, an excavating scoop connected with the chute and disposed for discharging therein, means mounted upon the turn table for manipulating the scoop and chute to give said scoop and chute a longitudinal translatable movement to direct the discharge from the scoop through the chute and through the opening in the turn table, and a guard shield upstanding from the turn table and positioned for limiting and directing the discharge from the chute.

5. In combination, a turn table having an opening, a pivotally mounted chute, a scoop fixed to the chute in position for discharging therein, and means mounted upon the



turn table for moving the scoop and chute in a translatory and longitudinal direction to manipulate the scoop and chute from a loading position to an elevated position for directing the load from the scoop through the chute across the pivot thereof and into the turn table opening.

6. In combination, a turn table having an opening, a scoop, a scoop beam shiftably and pivotally sustained by the turn table and comprising a chute, and means for moving the scoop beam in a longitudinal translatory direction to a position for discharging the chute into the turn table opening.

7. In combination, a turn table having an opening, a scoop, a scoop beam shiftably and pivotally sustained by the turn table and comprising a chute, a rack attached to said scoop beam, means mounted upon said turn table having operative engagement with said rack for shifting said beam, and independent means for swinging said beam for disposing said beam in a position for discharging into the turn table opening.

8. In combination, a turn table, a guide sustained by the turn table, a scoop, a scoop beam slidably engaging said guide and comprising a chute, a rack member attached to said scoop beam, gearing mechanism carried by said turn table in operative engagement with said rack, and means for rocking said scoop beam.

9. An excavating machine including a turn table, a scoop, a scoop beam attached to said scoop and comprising a discharge chute for said scoop, a pivot for said chute carried by said turn table, means attached to said pivot cooperating with said chute in such manner as to give said chute a translatory movement over said pivot, and means

for hoisting said scoop, substantially as described.

10. An excavating machine including a turn table, a scoop, a scoop beam comprising a chute for said scoop, a shaft mounted upon said turn table and comprising a support for said scoop beam, gearing means mounted upon said shaft in cooperation with said scoop beam in such manner as to permit said scoop beam to have a translatory movement over said shaft, means for rotating said shaft, and means for hoisting said scoop.

11. An excavating machine including a support, a scoop, a scoop beam comprising a chute for discharging said scoop, a rotative shaft, gearing means carried by said shaft in cooperation with said scoop beam in such manner as to give said scoop beam a translatory longitudinal movement, and means for hoisting said scoop.

12. In an excavating machine in combination, a supporting frame, a scoop, a scoop beam comprising a discharge chute for said scoop, a shaft rotatively mounted upon said supporting frame, rack members provided with grooves and attached to said scoop beam, supporting guides carried upon said shaft and being adapted to cooperate with the grooves in said rack members, gear wheels mounted upon said shaft in cooperation with the teeth of said rack members, and means for rotating said shaft to give said scoop beam a translatory longitudinal movement.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FRANCIS DONALDSON.

Witnesses:

W. M. DONALDSON,  
F. H. GIBBS.