

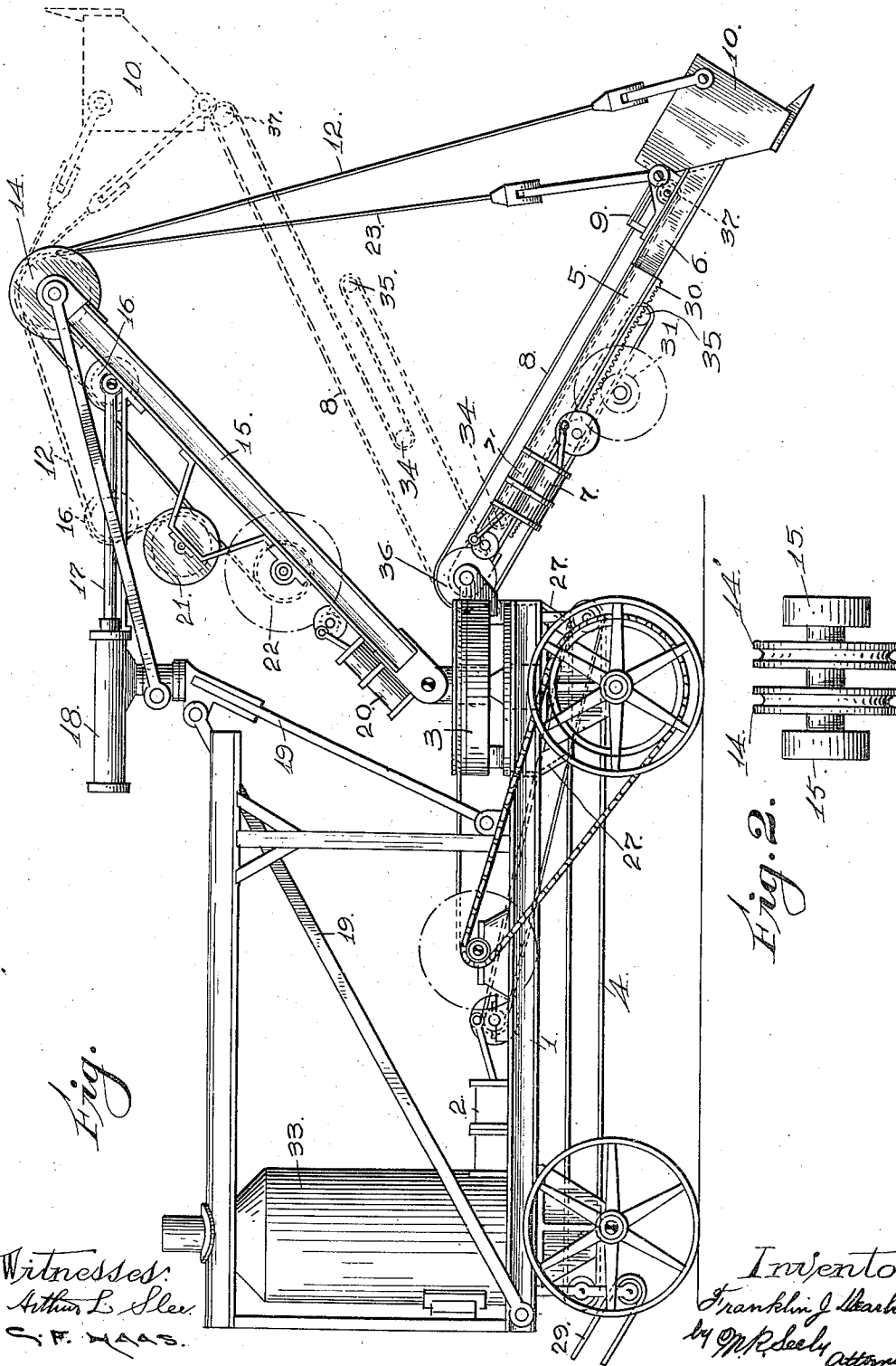
F. J. DEARBORN.
EXCAVATING MACHINE.

APPLICATION FILED JUNE 6, 1910. RENEWED SEPT. 9, 1912.

1,041,603.

Patented Oct. 15, 1912.

2 SHEETS—SHEET 1.



Witnesses:
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Inventor:
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Fig. 3.

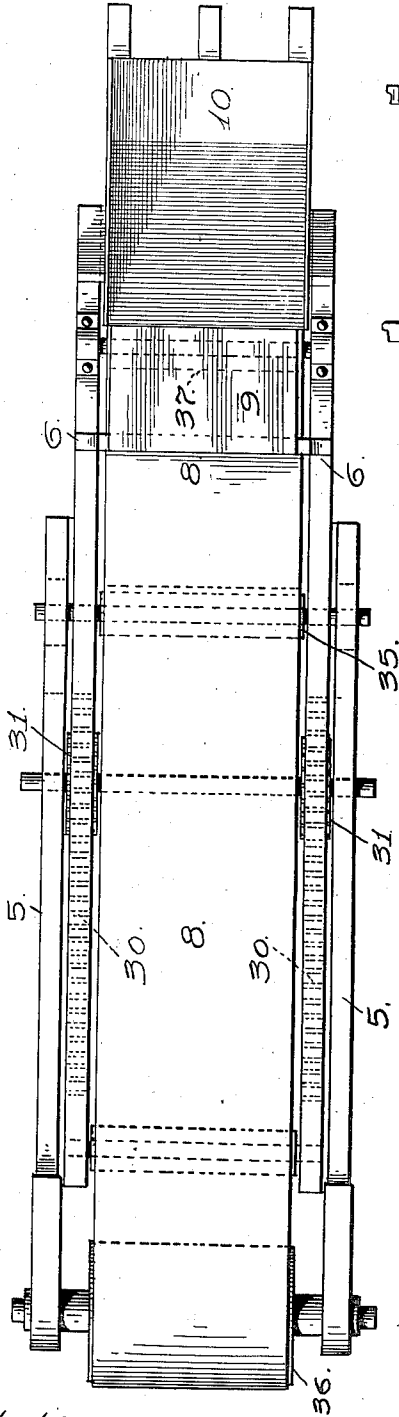
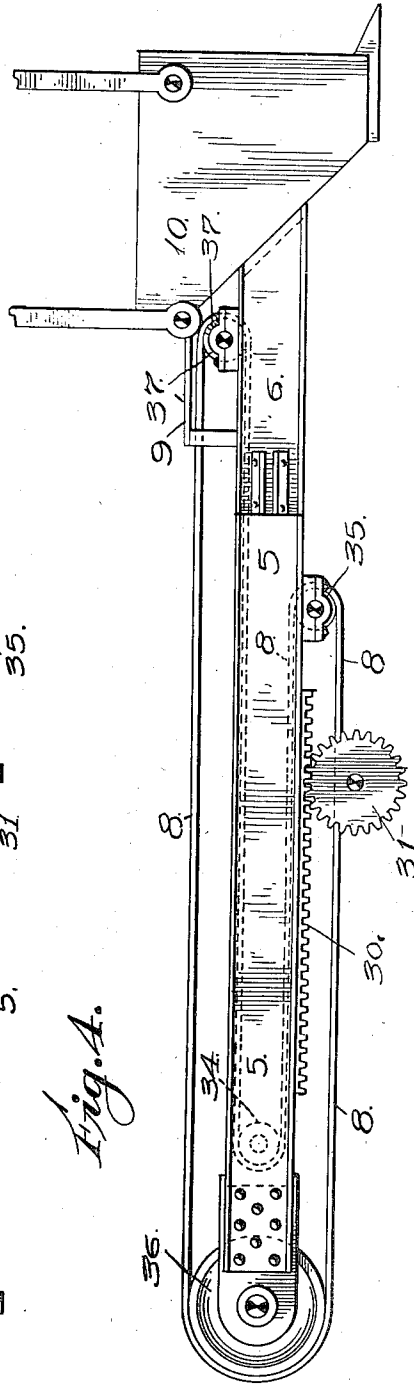


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANKLIN J. DEARBORN, OF OAKLAND, CALIFORNIA.

EXCAVATING-MACHINE.

1,041,603.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed June 6, 1910, Serial No. 565,403. Renewed September 9, 1912. Serial No. 719,459.

To all whom it may concern:

Be it known that I, FRANKLIN J. DEARBORN, citizen of the United States, residing at Oakland, county of Alameda, State of California, have invented certain new and useful Improvements in Excavating-Machines, of which the following is a specification.

My invention relates to an excavating machine or power shovel of the type used for continuous excavating, wherein it is desired to loosen and transport the loose material to a point distant from the excavation, and has for its object, a greater output within a given period, a ready manipulation of the material excavated, and a constant operation of the excavating apparatus. To accomplish these several features, I employ mechanism illustrated in the accompanying drawings, in which:

Figure 1, is a view in elevation of my excavating machine or power shovel; Fig. 2, is a detail view of the sheaves mounted on the end of the boom; Fig. 3, is a plan view of the extension ladder and shovel partly broken; Fig. 4, is a side elevation of Fig. 3.

1 is a carriage or truck of any suitable type and construction upon which is mounted the necessary power plant, as the steam boiler 33, and the engine 2. The truck or carriage also carries a turntable 3, a conveyer belt 4, a hopper 27, and a supporting frame 19.

A ladder 5 having an extension 6 is pivotally secured at one end of the turntable 3. This ladder carries an endless adjustable belt or conveyer 8 mounted upon the pulleys 36 and 37 and the idlers 34 and 35, a crowding engine 7 and the driving engine 7'; attached to the inner or truck end of the extension 6 is the movable idler 34 taking up or giving out the belt 8; also attached at or near the outer or shovel end of the ladder 5 is the return idler 37. Attached to the extension 6 is the rack 30 and to the ladder 5 the pinion 31 for operating the extension 6. The plate 9 is attached to the extension 6 for receiving the impact of the excavated material. A shovel or bucket 10 is pivotally mounted in suitable bearings on the extension 6, lifted and controlled by cables 12 and 23.

A boom 15 is pivotally connected to the turntable 3; at the upper end of this boom are mounted sheaves 14 and 14', (Fig. 2) over which the cables 12 and 23 pass from

the shovel or bucket 10 to the hoisting drum 22 driven by engine 20. The sheave 16 working in the bight of the dumping cable 12 is attached to a piston 17 operating in the cylinder 18 which is pivotally mounted on the top of the frame 19 in the same vertical axis as the turntable 3 to provide for its radial movement in connection with the boom 15. The sheave 21 is an idler under which the dumping cable 12 operates during the dumping of the shovel 10. By the action of the piston 17 in the cylinder 18 the cable 12 is shortened and controls the pivotal or dumping movement of the shovel 10, thereby causing the contents to be deposited upon the conveyer belt 8 which discharges the same into the hopper 27; from the hopper 27 it is received by belt 4, and delivered to the discharging conveyer 29.

The operation is as follows: The vehicle 1 is driven forward by means of the engine 2 with the ladder 5 adjusted by the cable 23 at the lowest point of excavation, until the shovel 10 is in contact with the face of the bank or material to be excavated. The engine 7 then operates the extension 6 by means of the rack 30 and pinion 31, causing the teeth or cutting edge of the shovel 10 to crowd into the material to be excavated. This last operation lengthens the top or carrying side of the conveyer 8, which additional length is supplied by movement of the idler 34 in the same direction and through the same distance as the crowding of the shovel causes the pulley 37 to move in. The pulley 37 and the idler 34 are attached at the opposite ends of the extension 6, while the idler 35 is attached to the ladder 5. As the extension 6 is crowded outward by the action of the pinion 31 in rack 30, the pulley 37 and the idler 34 move with it. As the distance between the pulleys 36 and 37 increases the distance between the idlers 34 and 35 decreases a like amount. By virtue of the manner in which the belt 8 is mounted over these idlers the additional length required in the top of the belt during the crowding operation is supplied from that portion between the idlers 34 and 35. When the shovel by means of the crowding operation has penetrated the bank or material to be excavated to the desired depth, the engine 20 (Fig. 1) operates the hoisting drum 22 over which the cables 12 and 23 are wound, lifting by means of these cables the ladder 5 and the shovel 10 on the pivoted

end of the ladder on the turntable 3. Immediately with the beginning of this operation, power is applied to the cylinder 18 and the sheave 16 is drawn backward in the bight of the dumping cable 12 to the position shown by the dotted lines thereby shortening the same and causing the shovel 10 to rotate in a vertical plane on its pivot and in this manner causing the teeth or cutting edge of the shovel to point upward. With the shovel in this position the operation of hoisting by means of the engine 20 and the hoisting drum 22 is continued until the top of the cut is reached or the limiting position of the shovel, as shown in the dotted lines. The material loosened from the face of the bank or material to be excavated during these operations, falls through the shovel 10 and on to the conveyer 8 which delivers it to the hopper 27, thence by means of the conveyer 4 to the discharging conveyer 29 which delivers it to the point of deposit. When the shovel has reached the top of the cut, or the limiting position, as shown by the dotted lines, the power is released from the cylinder 18 and the shovel allowed to rotate to the desired position and the whole is dropped to the lowest position, when the above operation is repeated. When it is desired to begin a new cut, the ladder and the shovel are rotated by means of the engine 2 and the turntable 3, which provides for its radial movement.

Power is transmitted to the different engines and cylinders by means of suitable connections, not shown.

Having described my invention what I claim and desire to secure by Letters Patent is:—

1. An excavating machine comprising a movable frame, a turntable mounted there-

on, a telescoping extension ladder pivotally secured to the turntable, a bucket pivotally carried by said ladder, a conveyer on said ladder for receiving the material from the bucket, a boom pivoted on the turntable, a drum, cables passing from the drum over the end of the boom to the bucket, and means engaging one of the cables for tilting the bucket on the ladder while the ladder is rising.

2. An excavating machine comprising a movable frame, a turntable mounted thereon, a telescoping extension ladder pivotally secured to the turntable, a bucket pivotally carried by said ladder, a conveyer on said ladder for receiving the material from the bucket, a boom pivoted on the turntable, a drum, cables passing from the drum over the end of the boom to the bucket, and means engaging one of the cables for tilting the bucket on the ladder while the ladder is rising, said means comprising a cylinder and piston located above the drum.

3. An excavating machine comprising a main frame, a turntable thereon, a boom pivoted on the turntable, a bucket carrying arm pivoted to the turntable, a drum, means for rotating the same, cables passing from the drum over the end of the boom to the arm, a cylinder pivotally supported over the turntable, the pivot being in line with the pivot of the turntable, a piston, and means for connecting the piston to one of the cables.

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

FRANKLIN J. DEARBORN.

Witnesses:

J. L. RUGGLES,
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