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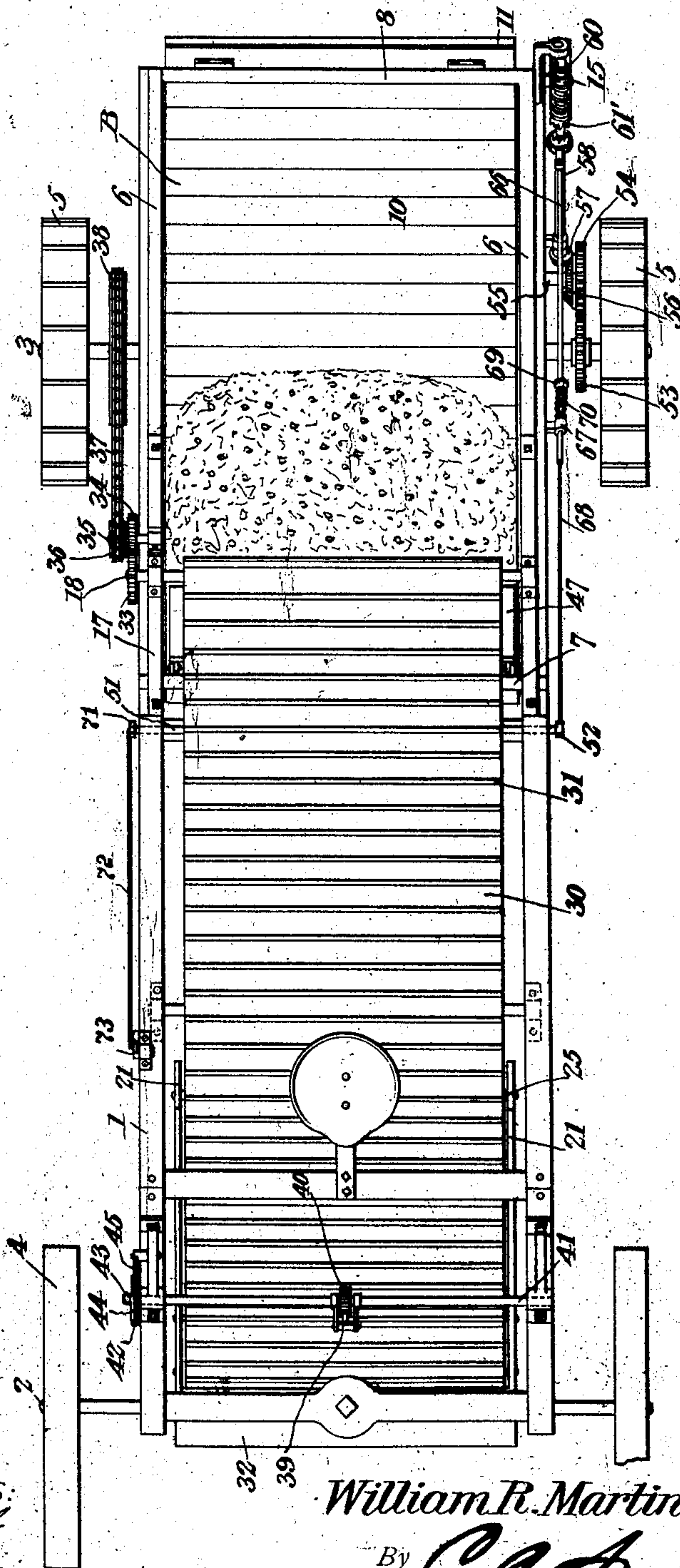
PATENTED JULY 31, 1906.

W. R. MARTIN.
EXCAVATOR.

APPLICATION FILED NOV. 29, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



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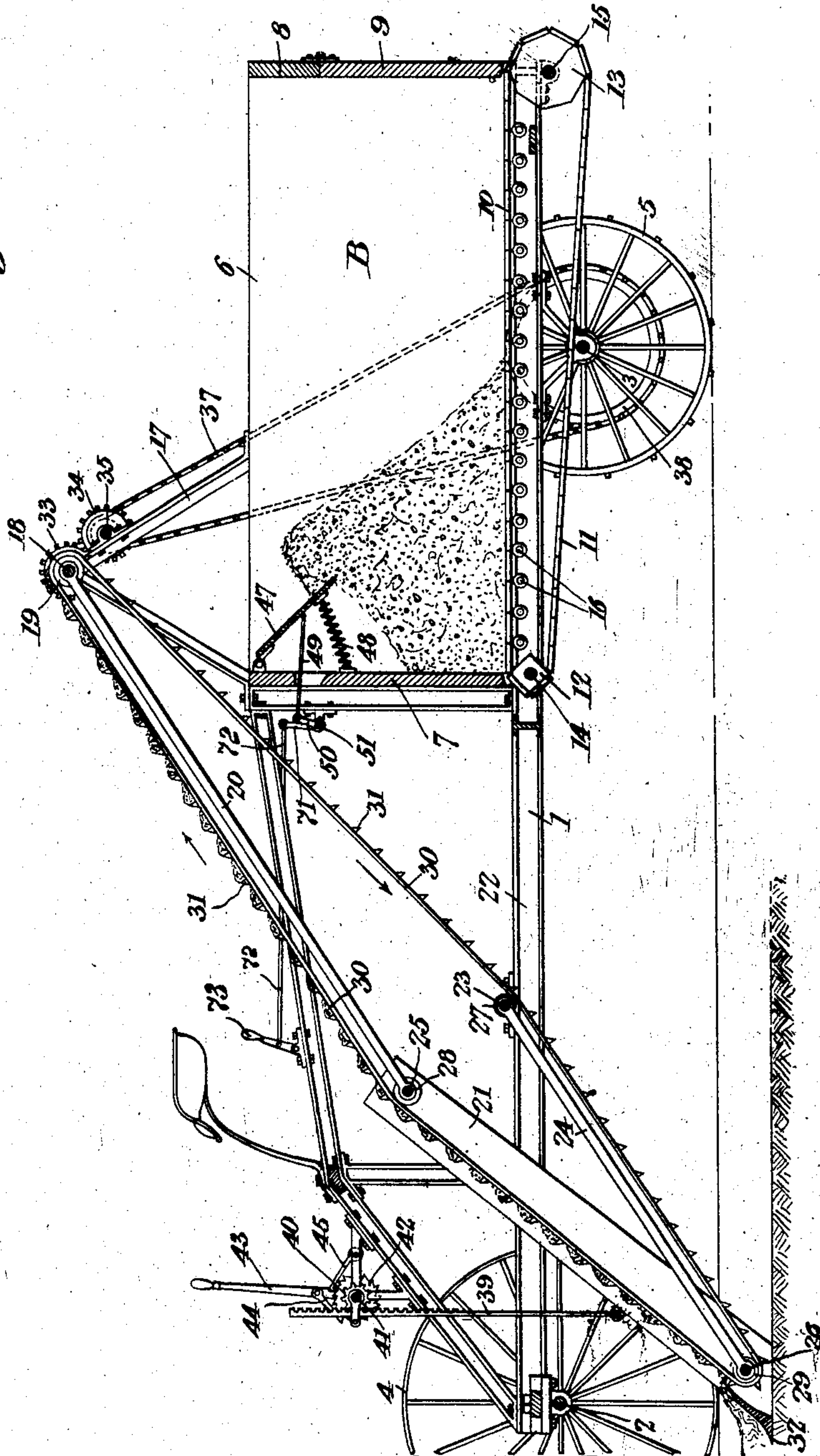
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3 SHEETS—SHEET 2.

Fig. 2.



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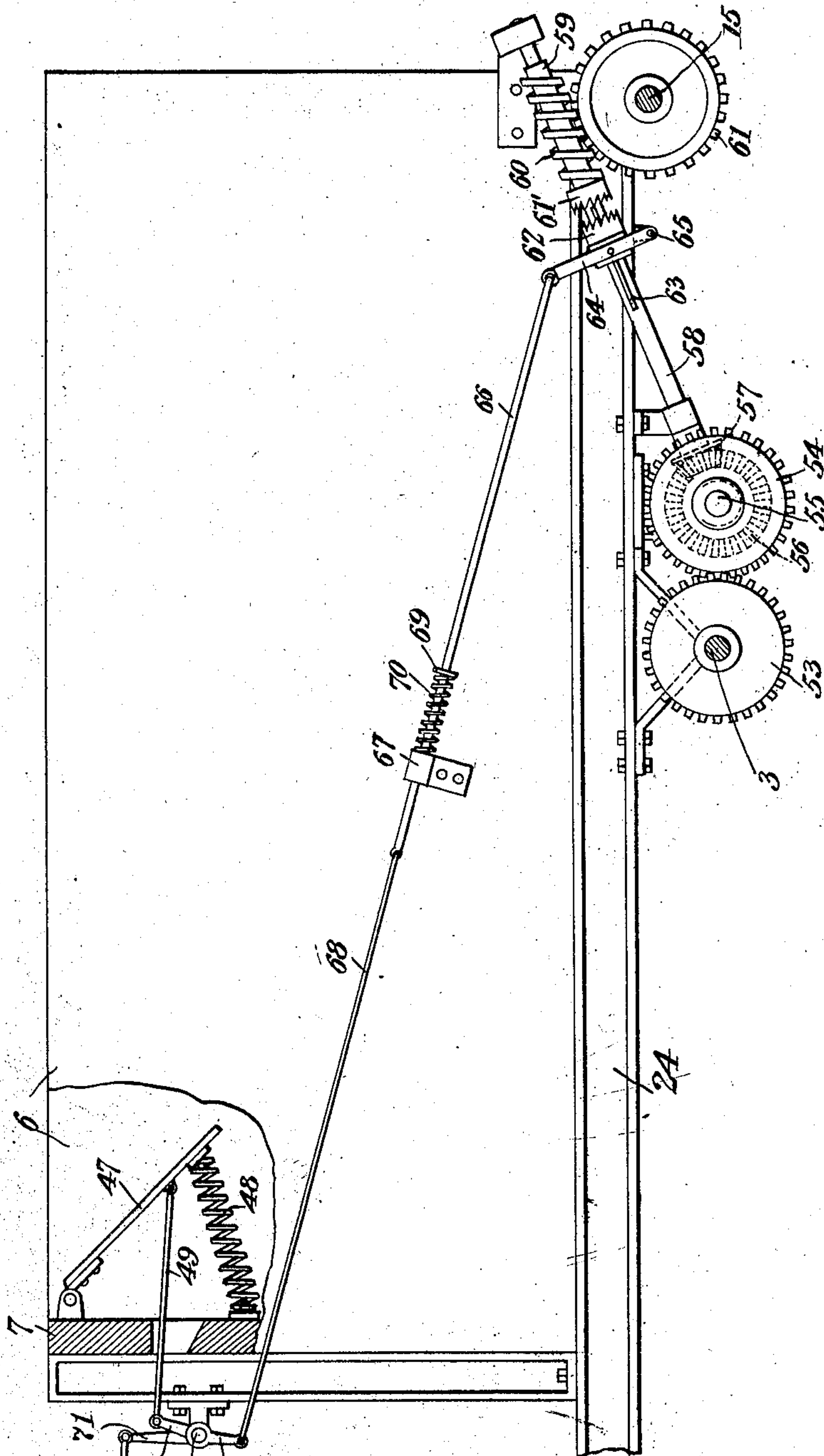
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM RILEY MARTIN, OF IDAHO FALLS, IDAHO.

EXCAVATOR.

No. 827,457.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed November 29, 1905. Serial No. 289,628.

To all whom it may concern:

Be it known that I, WILLIAM RILEY MARTIN, a citizen of the United States, residing at Idaho Falls, in the county of Bingham and State of Idaho, have invented a new and useful Excavator, of which the following is a specification.

This invention relates to excavators for digging or excavating ditches, trenches, and the like; and it has particular reference to an excavator of this class which is mounted upon carrying-wheels and which is provided with an adjustable frame carrying a digger and an endless conveyer or elevator whereby the dirt loosened by the digger is conveyed into a receptacle which is also supported upon the carrying-wheels and which forms a part of the complete structure. In excavators of this class as heretofore constructed the excavated material which is elevated by the endless conveyer is dumped by the latter into a receptacle where it accumulates until it overflows the top edges, unless it is shifted from the position in which it is deposited by the elevator or endless conveyer.

The principal object of the present invention is to prevent the accumulation of the excavated material in one particular location of the receptacle and to dispense with the necessity of shifting it manually.

Further objects of the invention are to simplify and improve the construction and operation of this class of devices.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations, and modifications within the scope of the invention may be made when desired.

In the drawings, Figure 1 is a top plan view of an excavating-machine constructed in accordance with the principles of the invention. Fig. 2 is a longitudinal vertical sectional view of the same. Fig. 3 is a side elevation, partly in section, of a portion of the machine, illustrating the automatic trip mechanism.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

In the construction of the improved excavating-machine there is provided a suitably-constructed frame 1, supported upon front and rear axles 2 3, having carrying-wheels 4 5. The frame 1 supports a box or receptacle B, the weight of which is supported mainly above the rear axle. This box or receptacle includes the side pieces 6 6, the front piece 7, and a rear member or cross-piece 8, at the lower edge of which is hingedly supported a rear end-gate 9. The bottom of the box or receptacle is composed of an endless conveyer 10, made up of a plurality of slats 11, suitably connected or linked together, so as to travel over a pair of polygonal rollers 12 13 upon shafts 14 15, which are supported for rotation in suitable boxes or bearings in the frame near the front and rear ends of the box or receptacle B. A plurality of rollers, as 16, are provided to support the upper lead or flight of the endless carrier 10, so as to prevent the latter from sagging under the weight imposed thereon.

Upon the upper edges of the side members 6 6 of the box are secured brackets 17, affording bearings for a shaft 18, carrying a roller 19. Upon the shaft 18 there are pivoted bars 20, the free ends of which are connected pivotally with the upper end of a frame 21. The side members 22 of the frame 1 are provided with bearings for a shaft 23, upon which are pivoted bars 24, the free ends of which are pivotally connected with the lower end of the frame 21, which latter is preferably provided with shafts 25 and 26, constituting pivots for the free ends of the bars 20 and 24, respectively. Upon the shafts 23, 25, and 26 there are mounted rollers 27, 28, and 29, which serve, in conjunction with the roller 19 upon the shaft 18, to support an endless conveyer 30, which may be of any suitable and appropriate construction, but which preferably consists of an endless apron of textile or other flexible material which is provided at intervals with slats 31, constituting buckets. A digger-blade 32 of suitable construction is carried at the lower end of the frame 21, said digger-blade being extended upwardly over the lower edge of the endless conveyer, so that material loosened by the said digging-blade in the progress of the machine will be deposited upon the said endless conveyer to be elevated thereby, as will be readily understood.

The shaft 18, which supports the upper end of the endless conveyer, has been shown as provided with a pinion 33, meshing with a pinion 34 upon a short shaft 35, supported in suitable bearings upon one of the brackets 17. The shaft 35 also carries a sprocket-wheel 36, which is connected by a link belt 37 with a sprocket-wheel 38 upon one of the hind wheels 5 of the machine, from which motion in the proper direction will thus be transmitted to the endless conveyer.

Suitably connected with the frame 21 is a rack-bar 39, which is guided in engagement with a pinion 40 upon a shaft 41, carrying also a ratchet-wheel 42. Upon the shaft 41 there is pivoted a lever 43, having a pawl 44 engaging the ratchet-wheel, which may thereby be turned to effect the adjustment of the frame 21, the latter being retained in adjusted position by means of a check-pawl 45, pivoted upon the frame of the machine. Other mechanism than that just described may be utilized within the scope of the present invention for the purpose of effecting the adjustment and the retention in adjusted position of the frame 21 and related parts, the construction just described being for the purpose of illustration only. A seat 46 for the driver or operator is suitably supported in convenient proximity to the lever 43.

It will be observed that the shaft 18, which supports the upper or discharge end of the endless conveyer or elevator 30, is disposed above the forward end of the box or receptacle B, so that material discharged over the said elevator or conveyer will naturally drop in the front end of said box or receptacle, which latter is obviously made of sufficient capacity to contain as much material as may be conveniently transported in one load. The material delivered by the endless conveyer or elevator will naturally drop in the front part of the box or receptacle, and to move said material gradually in a rearward direction in said box or receptacle mechanism is employed as follows: Upon the front end 7 of the box or receptacle B near the upper edge and between the side pieces 6 6 is hinged a trip-board 47, the free edge of which is normally forced in an upward direction by a suitably-disposed spring 48, the tendency of said spring being to force the free edge of the trip-board into the path of material discharged over the endless conveyer 30 and dropping into the box or receptacle B. The position of the trip-board remains practically unaffected until material accumulates in the box to such an extent as to rise above the free edge of said trip-board, after which additional material will accumulate above the trip-board and exert a downward pressure thereon sufficient to overcome the tension of the spring 48. The trip-board 47 is connected, by means of a link 49, with a crank 50, extending from a rock-shaft 51,

supported in suitable bearings upon the frame of the machine and having near its outer end a crank 52. Connected with one of the hind wheels 5 is a spur-wheel 53, meshing with a spur-wheel 54 upon a suitably-supported short shaft 55, which also carries a bevel-gear 56, meshing with a bevel-pinion 57 upon a shaft 58, supported in suitable bearings and carrying a sleeve 59, having a worm 60, meshing with a worm-gear 61 upon the shaft 15, carrying the roller 13, which supports the rear end of the endless conveyer 10, which constitutes the bottom of the box or receptacle B. The sleeve 59, which is loose upon the shaft 58, carries a clutch member 61', adapted to be engaged by a clutch-collar 62, which slidably engages the shaft 58 and is connected for rotation with the latter by means of a key or spline 63. The clutch-collar 62 is adjusted upon the shaft 58 by means of a shipping-lever 64, fulcrumed at 65 and connected pivotally with one end of a sliding rod 66, supported in a bearing 67, and the other end of which is connected with the crank 52 by means of a link or flexible connection 68. The sliding rod 66 has a collar 69, between which and the bearing 67 is interposed a spring 70, the tension of which is exerted to actuate the lever 64 to move the clutch-collar 62 into engaging position with the clutch member 61'.

It will be understood that the tension of the spring 48 is to be sufficiently powerful not only to support the trip-board 47, but also to overcome the tension of the spring 70, so as to hold the clutch member 62 normally out of engagement with the clutch member 61'. When by the accumulation of material in the box or receptacle B the trip-board 47 is depressed, the rock-shaft 51 will be oscillated in its bearings, thus releasing the strain upon the link or connecting member 68 and permitting the spring 70 to expand, thus actuating the sliding bar 66 and the lever 64 to throw the clutch-collar 62 into engagement with the clutch member 61', thus locking the latter upon the shaft 58, which is being constantly rotated by the intermediate gearing connecting it with one of the carrying-wheels 5. The worm 60 will now engage the worm-gear 61, causing the shaft 15 to rotate and the upper flight of the endless carrier 10 to be moved in a rearward direction, thus moving the pile of excavated material away from the trip-board 47. As soon as the latter is relieved from the abnormal weight of material resting thereon its free edge is forced in an upward direction by the spring 48, thereby exerting draft upon the link or connecting member 68 and moving the sliding bar 66 against the tension of the spring 70, thereby actuating the lever 64 to unship the clutch-collar 62 from engagement with the clutch member 61', and thus causing the stoppage of the endless conveyer 10. This operation

will be automatically repeated at intervals until the receptacle B has received its load.

The rock-shaft 51 is provided with an arm or crank 71, which is connected by a link 72 with a lever 73, which is supported in a position within convenient reach of the driver or operator, who by manipulating said lever may oscillate the rock-shaft at will. By means of this hand-lever it will be seen that the clutch mechanism 61' 62 may be held in engaging position for any desired period sufficient to effect the unloading of the contents of the box or receptacle B, the material passing under the hingedly-supported end-gate, as will be readily understood. Thus it will be seen that in the operation of the device it may be utilized to excavate a ditch or trench by causing the machine to travel over the ground with the ditcher-carrying frame adjusted to the desired depth. When a load has been accumulated, the frame 21 is elevated and supported in a raised position by the means provided for the purpose, and the load may then be conveyed to the dumping-place, where it may be discharged by first manipulating the lever 73 to throw the clutch members 61' 62 into engagement and then causing the machine to pass over the ground until the load has been discharged.

Having thus described the invention, what is claimed is—

1. In an excavating-machine, a load-carrying receptacle having an endless-conveyer bottom and means including a trip member operable by the load accumulating in the receptacle for intermittently actuating said endless conveyer.

2. In an excavating-machine, a load-carrying receptacle having an endless-conveyer bottom, and means including a trip member operable by the load accumulating in the receptacle whereby said conveyer-bottom will be automatically operated, at intervals.

3. In an excavating-machine, a load-carrying receptacle, and means including a trip member operable by the load accumulating in the receptacle for automatically shifting the position of the load in said receptacle.

4. In an excavating-machine, a load-carrying receptacle, and automatic means including a trip member operable by the load accumulating in the receptacle for moving the contents of said receptacle, intermittently, in the direction of the discharge end of the receptacle.

5. In an excavating-machine, a load-carrying receptacle, means for discharging material into the forward end of said receptacle, and means including a trip member operable by the load accumulating in the receptacle for intermittently and automatically moving the contents of the receptacle in a rearward direction.

6. In an excavating-machine, a load-car-

rying receptacle having an endless-conveyer bottom, means for driving said carrier-bottom including normally non-engaging clutch members, and means including a trip member operable by the load accumulating in the receptacle for placing said clutch members into engagement.

7. In an excavating-machine, a load-carrying receptacle having an endless-conveyer bottom, means for driving said conveyer-bottom including normally non-engaging clutch members, and means for placing said clutch members in engaging position said means including a trip member operable at intervals by the load accumulating in the receptacle.

8. In an excavating-machine, a load-carrying receptacle having an endless-conveyer bottom, means for driving said conveyer-bottom including clutch members, and a spring-actuated member tending to move one of the clutch members into engaging position with the other clutch member; and a spring-actuated trip member connected with the spring-actuated clutch-operating member and actuating the latter against the tension of its operating-spring to hold the clutch device normally in non-engaging position; said trip member being disposed within the load-carrying receptacle and operated at intervals by material accumulating in the latter.

9. In an excavating-machine, a wheel-supported frame having a load-receiving receptacle, means carried upon the frame for excavating material and for conveying the same into the receptacle, an endless conveyer constituting the bottom of said receptacle, a supporting-shaft for said conveyer having a worm-gear, a suitably-supported shaft driven from one of the carrying-wheels of the machine, a sleeve mounted loosely upon said shaft and having a worm meshing with the worm-gear and a clutch member, a clutch member slidably engaging the shaft, a shipping-lever engaging the slidable clutch member, a sliding rod connected with the shipping-lever, a spring actuating said rod and operating the shipping-lever to throw the clutch member into engaging position, a rock-shaft having oppositely-extending cranks, a link connecting one of said cranks with the slidable spring-actuated rod, a spring-actuated trip-board, and a link connecting said trip-board with another crank of the rock-shaft; said trip-board being disposed within the load-carrying receptacle and adapted to be automatically actuated at intervals by material accumulating in said receptacle.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM RILEY MARTIN.

Witnesses:

O. A. JOHANNESSEN,
L. A. HARTERT.