

No. 685,896.

Patented Nov. 5, 1901.

H. A. WISE.
EXCAVATING MACHINE.

(Application filed Feb. 18, 1901.)

(No Model.)

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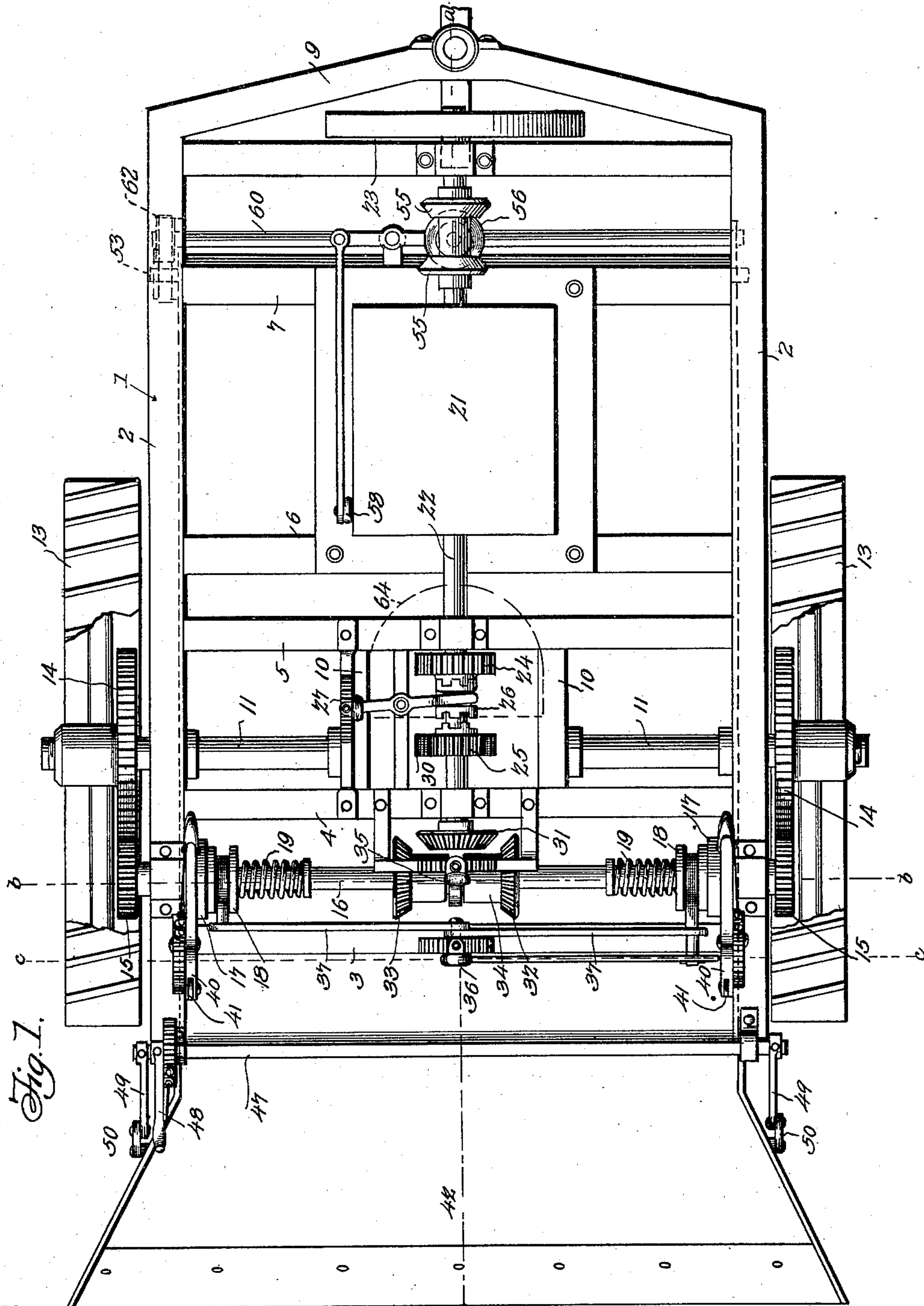


Fig. 1.

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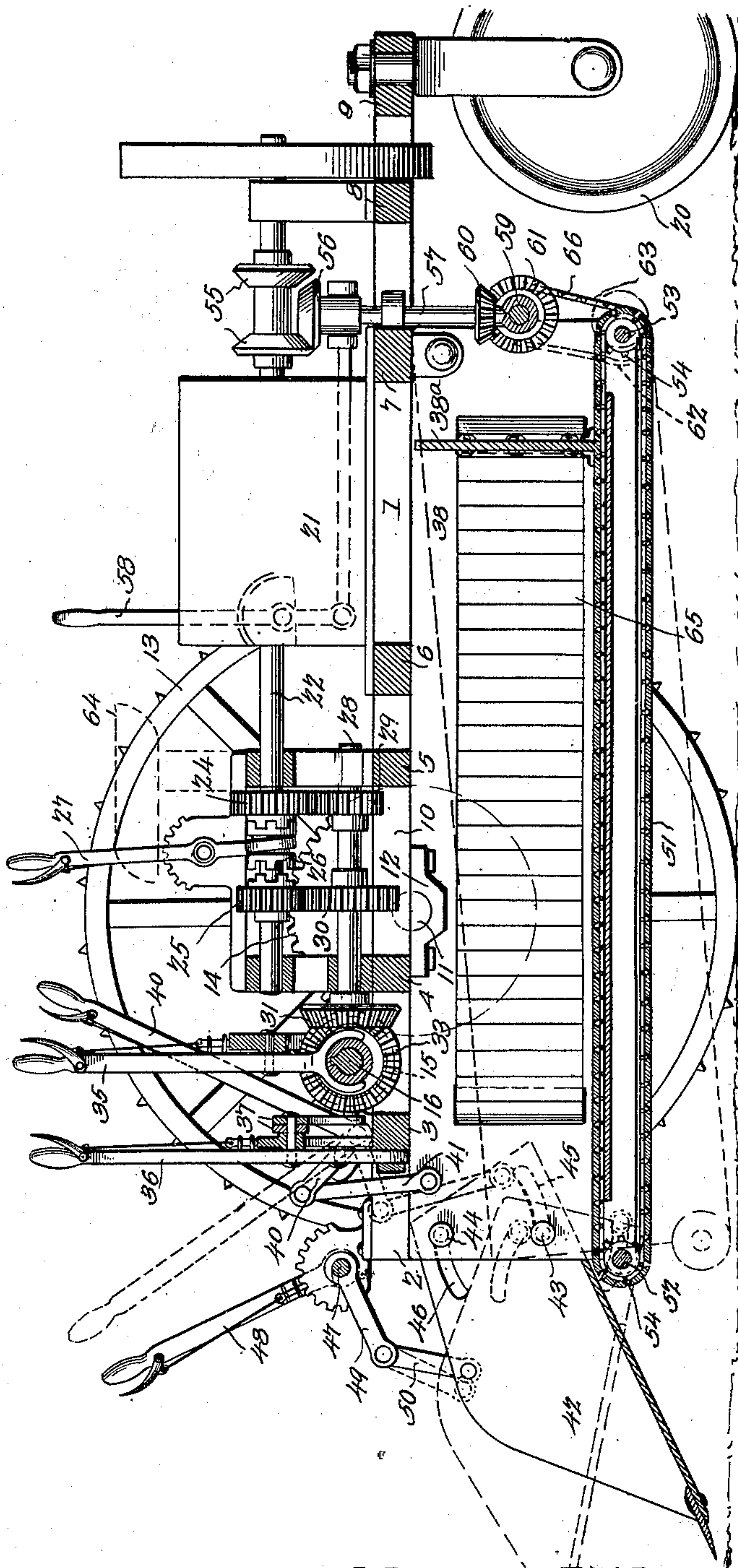
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Fig. 2.



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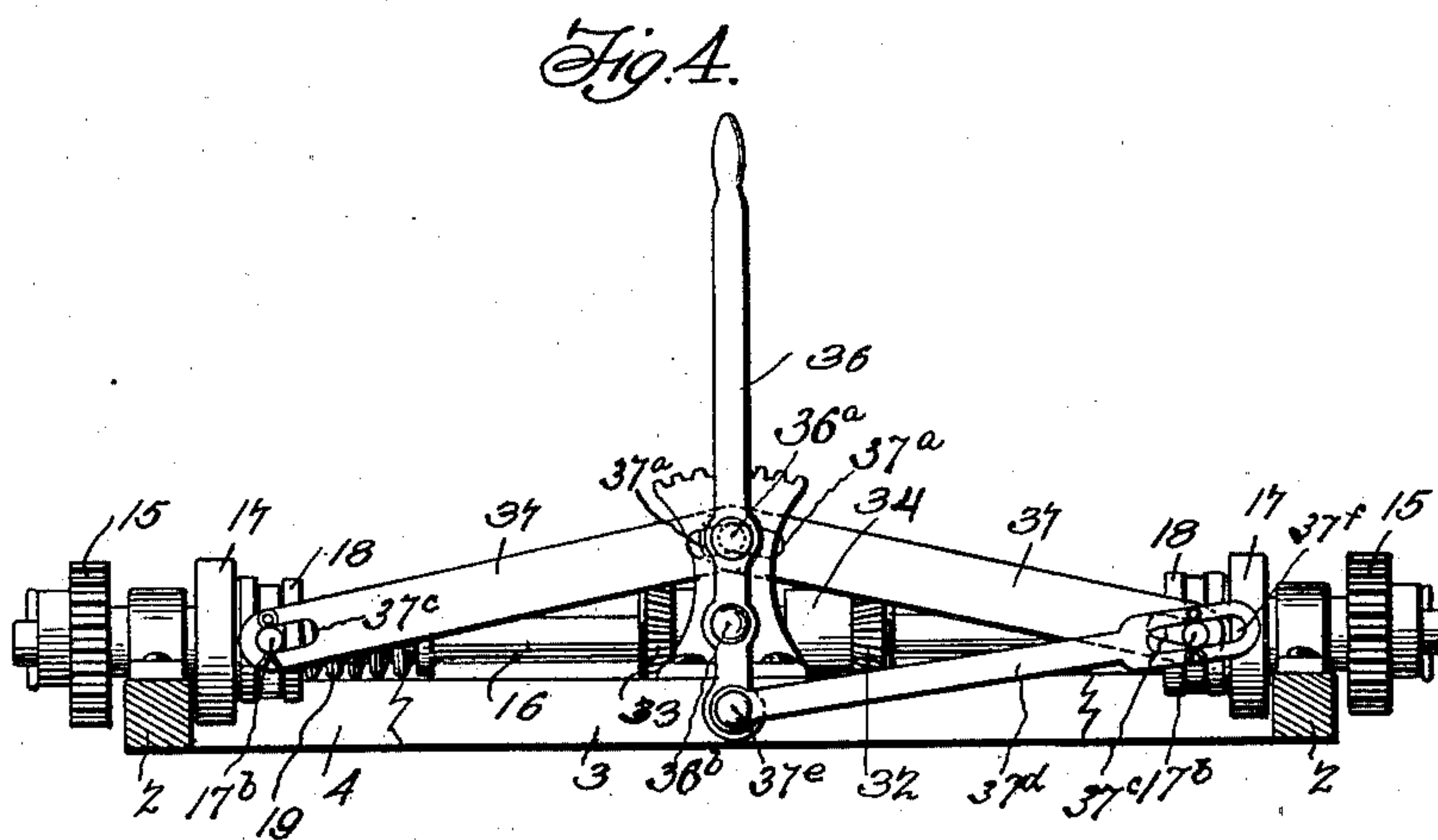
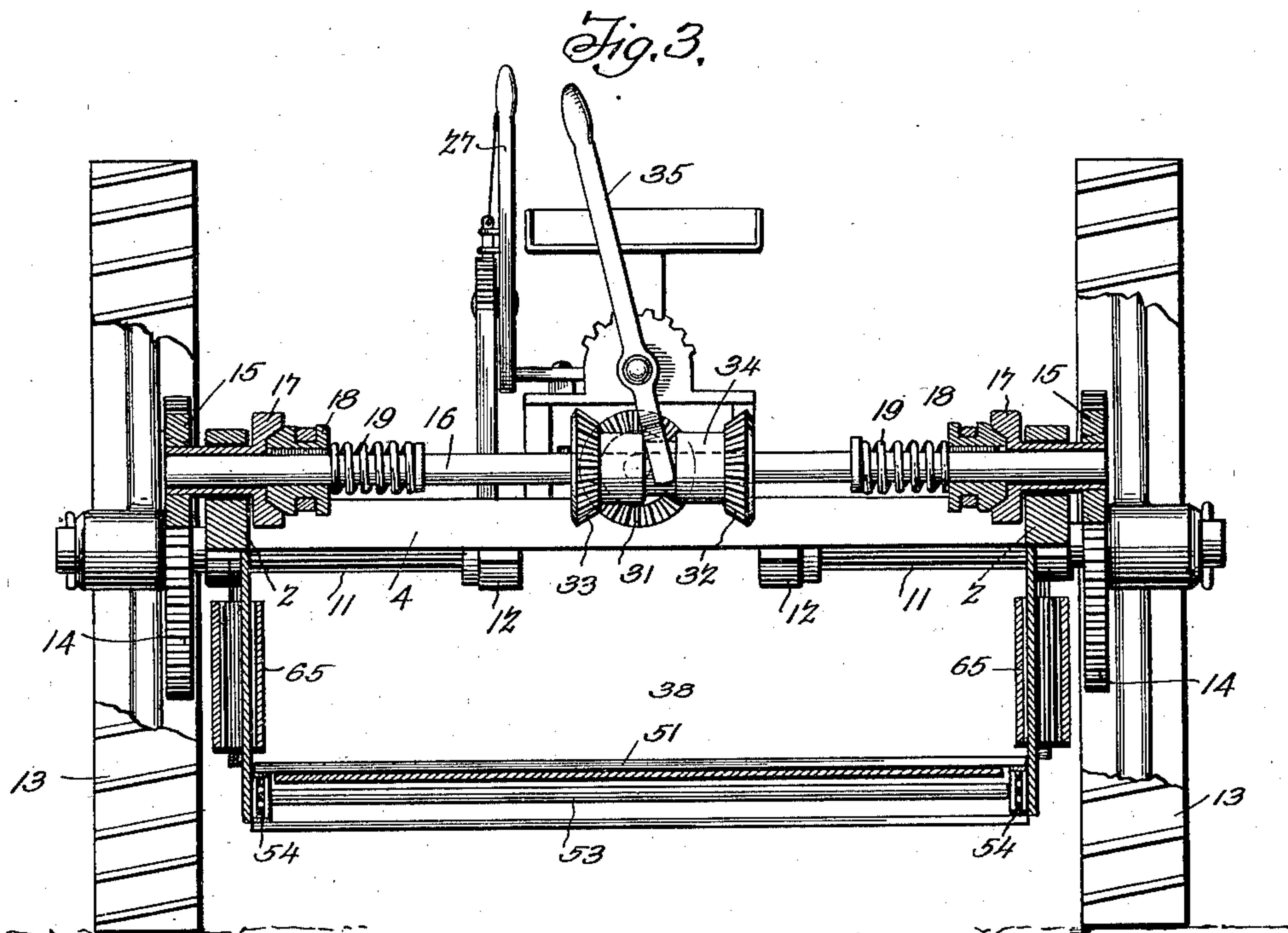
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

HERBERT A. WISE, OF LUXORA, ARKANSAS.

EXCAVATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 685,896, dated November 5, 1901.

Application filed February 18, 1901. Serial No. 47,793. (No model.)

To all whom it may concern:

Be it known that I, HERBERT A. WISE, a citizen of the United States, residing at Luxora, in the county of Mississippi and State of Arkansas, have invented a new and useful Excavating-Machine, of which the following is a specification.

My invention is an improved excavating-machine and road-grader; and it consists in the peculiar construction and combination of devices hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a top plan view of an excavating-machine and grader constructed in accordance with my invention. Fig. 2 is a vertical longitudinal sectional view of the same, taken on a plane indicated by the line *a a* of Fig. 1. Fig. 3 is a vertical transverse sectional view of the same, taken on a plane indicated by the line *b b* of Fig. 1. Fig. 4 is a detail view, partly in section, on the line *c c* of Fig. 1.

The main frame 1 may be of any suitable construction. As here shown, it comprises a pair of side bars 2, connected together by a series of cross-bars 3 4 5 6 7 8 9. The cross-bars 4 5, which are disposed somewhat in advance of the center of frame 1, are connected together by bars 10. Independent axle-shafts 11, which are disposed in line with each other, are journaled in bearings 12 on the under sides of the bars 2 10. On each of the said axle-shafts, at the outer end thereof, is a traction-wheel 13. Master-wheels 14, which are spur-gears, rotate with the said traction-wheels and are engaged by pinions 15, which are loose on a shaft 16. Revolvable with each of the pinions 15 is a friction-clutch member 17. Friction-cones 18 are splined on the shaft 16 and are pressed by springs 19 normally into engagement with the clutch members 17 to cause the pinions 15 to normally rotate with the shaft 16. It will be understood, however, that when one of the friction-cones is disengaged from the friction-clutch member of one of the pinions the latter will be loose on the shaft 16, and hence will not communicate power from the shaft 16 to one of the traction-wheels through the master-wheel 14 of the latter. Hence either of the traction-wheels may be disconnected from the shaft 16, which furnishes power thereto, at will.

At the rear end of the frame 1 is mounted a trail-wheel 20.

An engine, which is illustrated diagrammatically and designated by the reference-numeral 21, is mounted centrally on the frame 1, as here shown on the central portions of the cross-bars 6 7. Any suitable engine may be employed. A shaft 22 is continuously rotated by the engine when the machine is in operation, the said shaft 22 being the power-shaft. At the rear end of the latter is a friction-wheel 23, which also is a fly-wheel. A pair of spur-gears 24 25, which are of unequal diameters, are loose on the front portions of the power-shaft 22. By means of a clutch 26, which is splined on the said power-shaft, either of the said gears 24 25 may be made fast to and caused to rotate with said power-shaft. A lever 27 of suitable construction is connected to the said clutch and serves to operate the same.

A counter-shaft 28, which is journaled in suitable bearings and is here shown as below the power-shaft 22, is provided with a spur-wheel 29, which engages spur-wheel 24, and is further provided with a spur-wheel 30, which engages spur-wheel 25. By means of the said gears and the said clutch 26 the shaft 28 may be rotated at a greater or decreased rate of speed. At the front end of the counter-shaft 28 is a miter gear-wheel 31.

A pair of miter gear-wheels 32 33 are connected together by a tubular sleeve 34, which latter is splined on the shaft 16. The said gear-wheels 32 33 are disposed on opposite sides of the miter gear-wheel 31, and the distance between them is such that either may be engaged therewith or both may be disengaged therefrom. Hence the shaft 16 may be rotated in either direction in order to cause the machine to move forward or rearward, as may be required, and when both of the gears 32 33 are out of engagement with the gear 31 motion of the machine in either direction will be arrested. A hand-lever 35 is connected to the tubular sleeve 34 and is used to shift the gears 32 33. A hand-lever 36 is connected to links 37 by a pin 36^a, which operates in slots 37^a, at the inner ends of the links. The latter are connected to the friction-clutches 18 by pins 17^b, which operate in slots 37^c at the outer ends

of the said links. A link 37^d is pivoted to said lever 36, as at 37^e, the pivot 36^b of said lever being between the points 36^a and 37^e, and the outer end of said link 37^d has a slot 37^f, that
 5 engages one of the pins 17^b. Said hand-lever and said links serve to operate the said friction-clutches 18 for the purpose hereinbefore described.

A carrier-box 38 is disposed under the frame
 10 1 and is open at its front end. The carrier-box at its rear end is pivotally connected to the frame 1, as at 39, and thereby the front open end of the carrier-box is adapted to be raised and lowered. The bell-crank levers
 15 40, which are fulcrumed on the sides of the frame 1, near the front end thereof, are connected to the sides of the carrier-box, near the front end of the latter, by links 41. Said levers 40 serve to raise and lower the front end
 20 of the carrier-box, as will be understood. At the front end of the carrier-box and projecting in advance of the same is a scoop 42, the sides of which at the rear side of the scoop overlap the sides of the carrier-box at the
 25 front end of the latter and are connected thereto by bolts 43 44. The bolts 43 engage curved slots 45 in the sides of the scoop, which curved slots 45 are concentric with the bolts 44, and the latter engage curved slots 46
 30 in the sides of the scoop, which curved slots 46 are concentric with the bolts 43. Hence the scoop is pivotally connected to the front end of the carrier-box and is adapted to be raised and lowered. Furthermore, this means of
 35 connecting the scoop to the carrier-box enables the bottom of the scoop to be raised and lowered with relation to the bottom of the carrier-box. When the scoop is lowered at its front edge, the bottom thereof is also
 40 lowered to a position only slightly above the bottom of the carrier-box; but when the scoop is raised the bottom thereof is raised some distance above the bottom of the carrier-box, so that a space is formed between the bottom
 45 of the carrier-box and the bottom of the scoop. A rock-shaft 47 is journaled in suitable bearings on the front ends of the frame 1. The said rock-shaft is provided with a suitable lever 48 and is further provided with rock-
 50 arms 49, the latter being connected to the sides of the scoop by links 50. Thereby the scoop may be raised or lowered, as will be understood.

The carrier-box is provided in its lower side
 55 with a conveyer 51 of suitable construction, which operates on the bottom of the carrier-box and is carried by endless sprocket-chains. The said conveyer is supported at the front and rear sides of the carrier-box by shafts
 60 52 53, respectively, which are provided with sprocket-wheels 54, that engage the carrier or conveyer sprocket-chains. When the machine is in operation and is advancing, the conveyer travels rearward on the bottom of
 65 the carrier-box and conveys the gate 38^a rearward in the carrier-box from the scoop, the

said gate moving rearward as the earth is delivered into the carrier by the scoop, whereby the earth is disposed compactly in the carrier-box, as will be understood, thus avoid- 70
 ing the necessity of shoveling the excavated earth in the carrier-box. When discharging earth from the carrier-box, the scoop is raised, whereby a space is formed above the conveyer and below the scoop, and the conveyer 75
 is caused to convey the earth from the carrier-box, the said conveyer being caused to move forward on the bottom of the carrier-box and the gate 38^a moving forward therewith. The endless traveling chains which 80
 carry said conveyer are positively driven by power conveyed thereto from the engine, and any suitable means may, within the scope of my invention, be employed to convey power from the engine to the said conveyer. In the 85
 embodiment of my invention here shown I employ a pair of reversely-disposed friction-cones 55, either of which may be engaged by a friction-cone 56 on a shaft 57, that may be shifted by a lever 58. Said shaft 57 is mount- 90
 ed and movable in suitable bearings and is geared to a shaft 59 by miter-gears 60 61. Said shaft 59 has a sprocket-wheel 62, which is connected to a sprocket-wheel 63 on shaft 53 by an endless sprocket-chain 66. 95

In order to facilitate the compact disposition of the excavated earth in the carrier-box when the machine is in operation, I provide the sides of the carrier-box with conveyer- 100
 belts 65, which are not positively driven, but serve to reduce friction between the earth and the sides of the carrier-box and are connected to the ends of the gate 38^a, said gate and said conveyers 51 65 moving in unison.

In practice I provide the conveyers 51 65 105
 with antifriction-rollers to reduce friction between said conveyers and the bottom and sides of the carrier-box.

Having thus described my invention, I claim— 110

1. In an excavator and grader, the combination of a wheeled frame and means to propel the same, a carrier-box carried by said wheeled frame and having its front end open, means to raise and lower the front end of the 115
 carrier-box, a scoop at the front end of said carrier-box, means to raise and lower said scoop, a traveling bottom in said carrier-box, and a gate attached to and movable back and forth in said carrier-box by said traveling bot- 120
 tom, substantially as described.

2. In an excavator and grader, the combination of a main frame having independently-revoluble traction-wheels, a power-shaft, pinions loose on the latter and geared to the traction-wheels, spring-pressed friction-clutches splined on said power-shaft and normally engaged with the pinions, a lever, links 37 connected thereto on one side of the pivot thereof, and connected to said clutches, said lever 130
 having lost motion on said links and the latter having lost motion on said clutches, and

a link 37^d connecting said lever to one of said clutches, said link having lost motion on said clutch, substantially as described.

3. In an excavator and grader, the combination of a carrier-box, a support therefor, means to raise and lower the front end of the carrier-box, a scoop having side walls overlapping the sides of the carrier-box, the scoop being at the front end of the latter, pivotal bolts connecting the sides of the carrier-box and scoop, the latter having adjusting-slots in which the bolts operate, means to raise and lower the front end of the carrier-box, means to raise and lower the scoop, and a conveyer in the bottom of the carrier-box, substantially as described.

4. In an excavator and grader, the combination of a wheeled frame, a carrier-box carried thereby and having its front end open, means to raise and lower the front end of the carrier-box, a traveling bottom in the carrier-box, and a scoop at the front end of said carrier-box, said scoop being adapted to be adjusted to any desired inclination and adapted to be raised and lowered on the carrier-box, substantially as described.

5. In an excavator, the combination of a main frame having independently-revoluble traction-wheels on opposite sides, an engine

on said frame, a gear revolved by the engine, a power-shaft, a sleeve splined thereon, gears on said sleeve, disposed on opposite sides of the engine-gear and adapted to be successively engaged therewith, a lever to shift said sleeve, pinions loose on said power-shaft, and geared respectively to the traction-wheels, spring-pressed clutches splined on said power-shaft, and normally engaged with said pinions, and means to independently release said clutches from said pinions, substantially as described.

6. In an excavator and grader, the combination of a wheeled frame and means to propel the same, a carrier-box carried by said wheeled frame, and having its front end open, means to raise and lower the front end of the carrier-box, a scoop at the front end of the latter, a traveling bottom in said carrier-box, and a gate attached to and movable back and forth in said carrier-box by said traveling bottom, substantially as described.

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

HERBERT A. WISE.

Witnesses:

C. L. GRIGSBY,
W. B. CALHOUN.