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Patented Oct. 15, 1901.

E. H. TAYLOR.
EXCAVATOR AND CONVEYER.

(Application filed Feb. 2, 1901.)

(No Model.)

2 Sheets—Sheet 1.

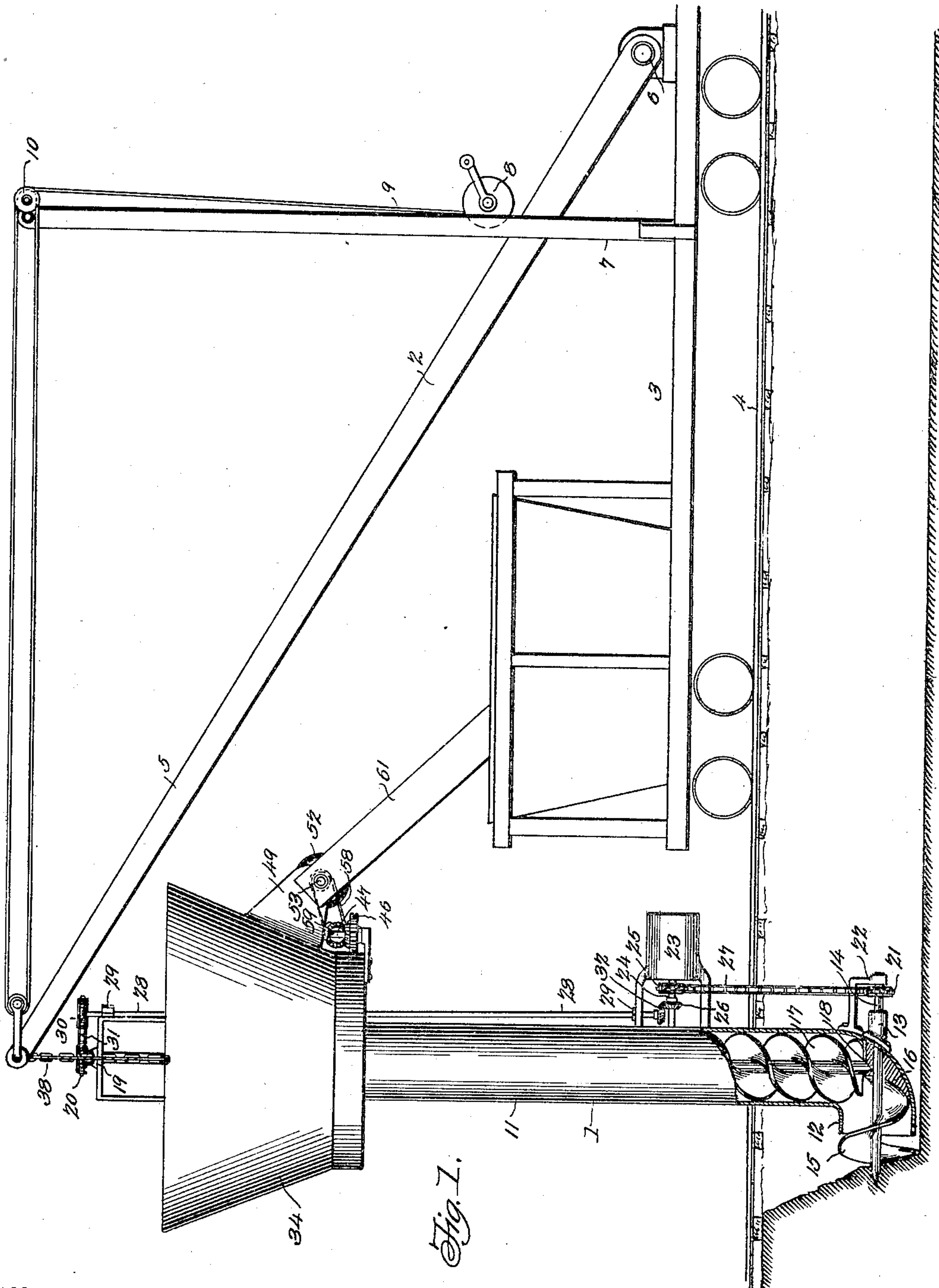


Fig. 1.

Witnesses

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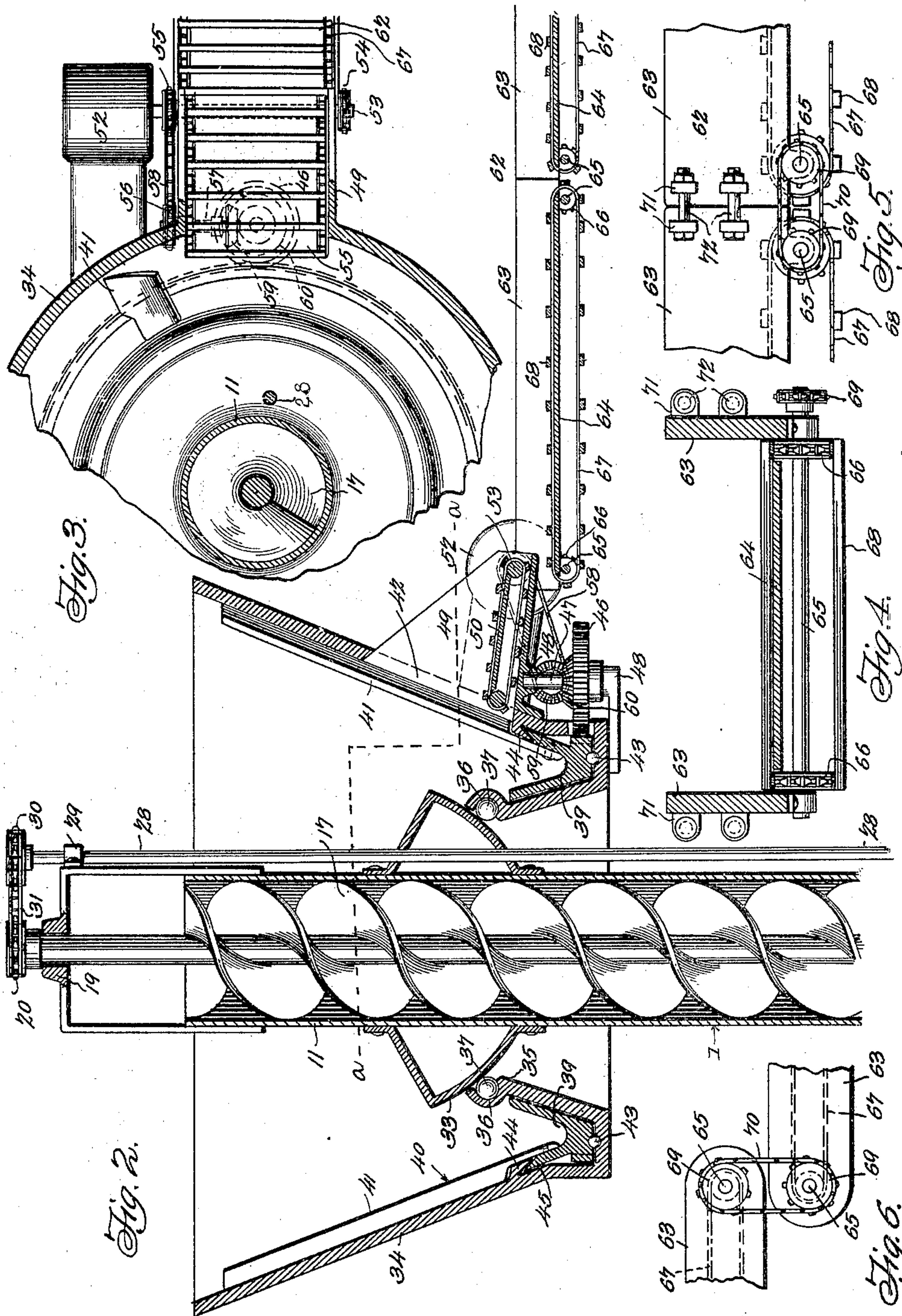
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UNITED STATES PATENT OFFICE.

EDGAR H. TAYLOR, OF MOUND CITY, ILLINOIS.

EXCAVATOR AND CONVEYER.

SPECIFICATION forming part of Letters Patent No. 684,762, dated October 15, 1901.

Application filed February 2, 1901. Serial No. 45,766. (No model.)

To all whom it may concern:

Be it known that I, EDGAR H. TAYLOR, a citizen of the United States, residing at Mound City, in the county of Pulaski and State of Illinois, have invented a new and useful Excavator and Conveyer, of which the following is a specification.

My invention is an improved excavator and conveyer for excavating earth, grading, ditching, and conveying the earth to any desired point; and it consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of my improved excavating-machine, showing the same arranged in operative position. Fig. 2 is a detail sectional view of the upper portion of the excavator. Fig. 3 is a detail horizontal sectional view of the same, taken on a plane indicated by the line *a a* of Fig. 2. Fig. 4 is a detail transverse sectional view of the conveyer. Fig. 5 is a detail side elevation of the same. Fig. 6 is a detail elevation showing a modification of the conveyer.

The excavator 1 is suspended from a derrick 2 on a car or other suitable support 3. As here shown, the car is on a track 4, which is parallel with the ditch in course of construction. The derrick-arm 5 is pivoted at one end on a suitable support 6, with which the car is provided. The vertical hoisting-frame 7 is provided with a winch 8. The hoisting rope or cable 9, which is attached to the winch, engages blocks or sheaves 10 at the upper end of the hoisting-frame and the outer end of the derrick-arm. Thereby the latter may be raised and lowered in order to raise and lower the excavator. The derrick may, however, be of any other suitable construction, and I do not limit myself in this particular. The vertical elevating-tube 11 of the excavator is provided at its lower end with a forward-extending intake-elbow 12, in the rear side of which is an elongated bearing 13 for a horizontally-disposed auger-shaft 14, at the front end of which is a cutting and boring auger 15, which operates in the intake-elbow and projects forward therefrom. The function of the auger 15, as will be understood,

is to excavate the earth in advance thereof and to feed the excavated earth rearward through the intake-elbow 12 into the lower end of the elevating-tube 11. It will be observed by reference to Fig. 1 that the intake-elbow is provided at the rear of the auger 15 with a concaved offset 16, which conforms to the shape of the flight at the rear end of said auger 15 and forms a coacting seat therefor, the flight of the auger and the said offset 16 coacting to force the excavated earth from the intake-elbow 12 upward into the lower end of the elevating-tube 11 and to prevent any of the excavated earth from lodging in the said elbow.

In the elevating-tube 11 is mounted the vertically-disposed elevating-worm 17, the shaft of which has its lower end stepped in a bearing 18, formed in the upper side of the offset 16. At the upper end of the elevating-tube 11 is a bearing 19 for the upper portion of the worm-shaft 17. A sprocket-wheel 20 is fixed to the upper end of the worm-shaft 17. A sprocket-wheel 21 is fixed to the auger-shaft 14 near the rear end thereof. The extreme rear end of the auger-shaft has its bearing in a bracket 22 on the rear side of the intake-elbow 12.

On the rear side of the elevator-tube is secured a suitable frame, casing, or support (represented diagrammatically at 23) for a suitable engine, preferably an electric motor, of which the power-shaft is designated at 24. The said power-shaft is provided with a sprocket-wheel 25 and with a miter gear-wheel 26. An endless sprocket-chain 27 connects the sprocket-wheel 25 with the sprocket-wheel 21, and hence power is conveyed from the engine or motor to the excavating-auger, as will be understood. On the rear side of the elevating-tube 11 is a vertical shaft 28, which is mounted in suitable bearings, as at 29. Said shaft has at its upper end a sprocket-wheel 30, which is connected to the sprocket-wheel 20 of the elevating-worm shaft by an endless sprocket-chain 31, and said shaft has at its lower end a miter gear-wheel 32, which engages the gear-wheel 26 and coacts therewith to convey power from the power-shaft of the engine or motor to the shaft 28, power being conveyed from the

latter to the elevating-worm by the sprocket-wheels 20 30 and sprocket-chain 31, as will be understood.

Near the upper end of the elevating-tube 11 5 and securely attached thereto is a support 33, the lower portion of which forms a section of a sphere. A hopper 34, of inverted truncated conical form, is disposed around the upper portion of the elevating-tube and is provided 10 in its under side with an annular socket 35, having a ball-race 36, in which are disposed bearing-balls which bear against the rounded lower surface of the support 33. Hence a ball-and-socket joint is formed between the 15 said hopper and the upper portion of the elevating-tube, so that the elevating-tube may be disposed at any required angle with relation to the axis of the hopper. The latter is suspended from the derrick-arm 5 by any 20 suitable means, chains (indicated at 38) being here shown for this purpose. In the bottom of the hopper is the supporting member 39 of a revoluble scraper 40, which comprises the supporting member 39 and scraping-blades 41, 25 the latter operating on the inner side of the hopper and preventing earth from adhering thereto and also facilitating the discharge of the earth from the hopper through the opening 42 in one side thereof. The supporting mem- 30 ber 39 has a suitable bearing in the bottom of the hopper, here shown as a ball-bearing, the bearing-balls 43 operating in a race formed in the proximate sides of the supporting member 39 and the bottom of the hopper. In 35 the hopper is a flange 44, which overlaps an annular flange 45 on the upper side of the supporting member 39, to which flange 45 the lower ends of the blades 41 are attached. The member 39, which is circular in form, is 40 provided with peripheral spurs, and hence forms a spur-gear, which is engaged by a pinion 46 on a short vertical shaft 47, the upper and lower ends of which are journaled in suitable bearings 48. A spout or discharge- 45 way 49 extends outward from the opening 42, and on the lower side thereof is an endless traveling discharge-conveyer 50 of suitable construction, which is adapted to convey the excavated earth from the hopper through the 50 opening 42. A suitable engine, (illustrated diagrammatically at 52,) as an electric engine, is carried by the hopper, being disposed on the rear side thereof, and rotates the outer shaft 53 of the conveyer 50, thereby imparting motion to the said conveyer. The said 55 shaft 53 is further provided with sprocket-wheels 54 55. The sprocket-wheel 55 is connected to a similar wheel 56 on a shaft 57 by an endless sprocket-chain 58. Said shaft 57 60 is journaled in suitable bearings and at its inner end is provided with a miter gear-wheel 59, which engages a similar wheel 60 on the shaft 47. Thereby power is conveyed from the motor or engine 52 also to the revoluble 65 scraper in the hopper.

In Fig. 1 of the drawings I show a dis-

charge-chute 61, which receives earth from the conveyer 50 and discharges the same onto the car.

In Fig. 2 I show a sectional conveyer 62, 70 which may be employed to convey the excavated earth from the hopper 34 to any suitable point. Each section of the sectional conveyer 62 comprises a frame 63 of suitable length, a bottom 64, which connects the 75 sides of the frame, shafts 65 in bearings at the ends of the section, sprocket-wheels 66 on said shafts, endless traveling sprocket-chains 67, which connect the sprocket-wheels of said respective shafts, and transversely-dis- 80 posed flights 68, which connect said sprocket-chains and on the upper leads thereof pass over the bottom of the section-frame. Each of the shafts 66 is provided at one end on the 85 outer side of the frame with a sprocket-wheel 69, and when two or more of the said sections are joined together endwise the endless traveling conveying element of each section is connected to the endless traveling convey- 90 ing element of the adjacent section by an endless sprocket-chain 70, which connects the adjacent sprocket-wheels 69, the said sprocket-chains 70 and wheels 69 conveying 95 power from one conveying element to the next in series, as will be understood. This means for connecting the conveying-sections 100 together enables the sections to be disposed either in a straight line or at an angle with relation to each other, and hence the sectional conveyer as a whole may be extended from 105 the excavator in any direction and disposed either in a straight line, a curve, or a series of curves, as may be required to reach the objective point at which the material is ultimately discharged. Any suitable means, as 110 trestles, horses, or the like, may be employed to support the sections of the sectional conveyer. The frames of the sections of the sectional conveyer may be connected together at 115 their proximate ends by any suitable means. In Figs. 4 and 5 I show the said frames as provided with lugs 71, which project from 120 their outer sides and show bolts 72 of suitable length engaging said lugs and securing the ends of the sections together.

In the modified form of the sectional conveyer shown in Fig. 6 the ends of the frames are not directly connected together, but are 125 disposed one below the other. Other means may be employed to secure the sections of the sectional conveyer together and to support the same, and I do not limit myself in this particular.

Having thus described my invention, I claim—

1. In an excavator, the combination of an 125 elevating-tube having an intake-elbow at its lower end, an excavating-auger in the said elbow projecting in advance thereof to cut material in advance of said elbow and force said 130 excavated material rearward through said elbow, and an elevating element in said elevat-

ing-tube to receive the said excavated material from the intake-elbow and carry the excavated material up through the elevating-tube, substantially as described.

5 2. In an excavator, the combination of an elevating-tube having an intake-elbow at its lower end, an excavating-auger in the said elbow, an elevating-worm in said elevating-tube, and means to actuate said excavating-
10 auger and elevating-worm, substantially as described.

3. In an excavator, the combination of an elevating-tube having an intake-elbow at its lower end, an excavating-auger in said elbow,
15 an elevator element in said elevating-tube, a motor supported and carried by said elevating-tube and connections between the said motor and said excavating-auger and elevator element, substantially as described.

20 4. In an excavator, the combination of an elevating-tube having an intake-elbow at its lower end, said elbow provided at its rear side with a concaved offset 16, an excavating-auger in said elbow and having the flight
25 adapted at its rear end to the front side of said offset, for the purpose set forth, and an elevating-worm in said elevating-tube, substantially as described.

5. In an excavator, the combination of an
30 elevating-tube, a hopper in which the upper portion of said elevating-tube is disposed, said tube and hopper being connected together

by a universal joint, for the purpose set forth, and means to suspend the said hopper and thereby support the said elevating-tube, sub- 35
stantially as described.

6. In an excavator, the combination of an elevating-tube, a hopper into which said elevating-tube discharges and a revoluble
40 scraper in said hopper, the latter having a discharge-opening, substantially as described.

7. In an excavator, the combination of an elevating-tube, a hopper into which said elevating-tube discharges, and a revoluble
45 scraper in said hopper, the latter having a discharge-opening, and said revoluble scraper having a gear, and a counter-shaft having a pinion engaging said gear, substantially as described.

8. In an excavator, the combination of an
50 elevating-tube, a hopper into which said elevating-tube discharges, said hopper having a discharge-opening, a revoluble scraper in said hopper, a motor supported and carried by the hopper and connections between the motor
55 and the revoluble scraper to operate the latter, 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.

EDGAR H. TAYLOR.

Witnesses:

J. W. GARNER,

F. S. APPLEMAN.