

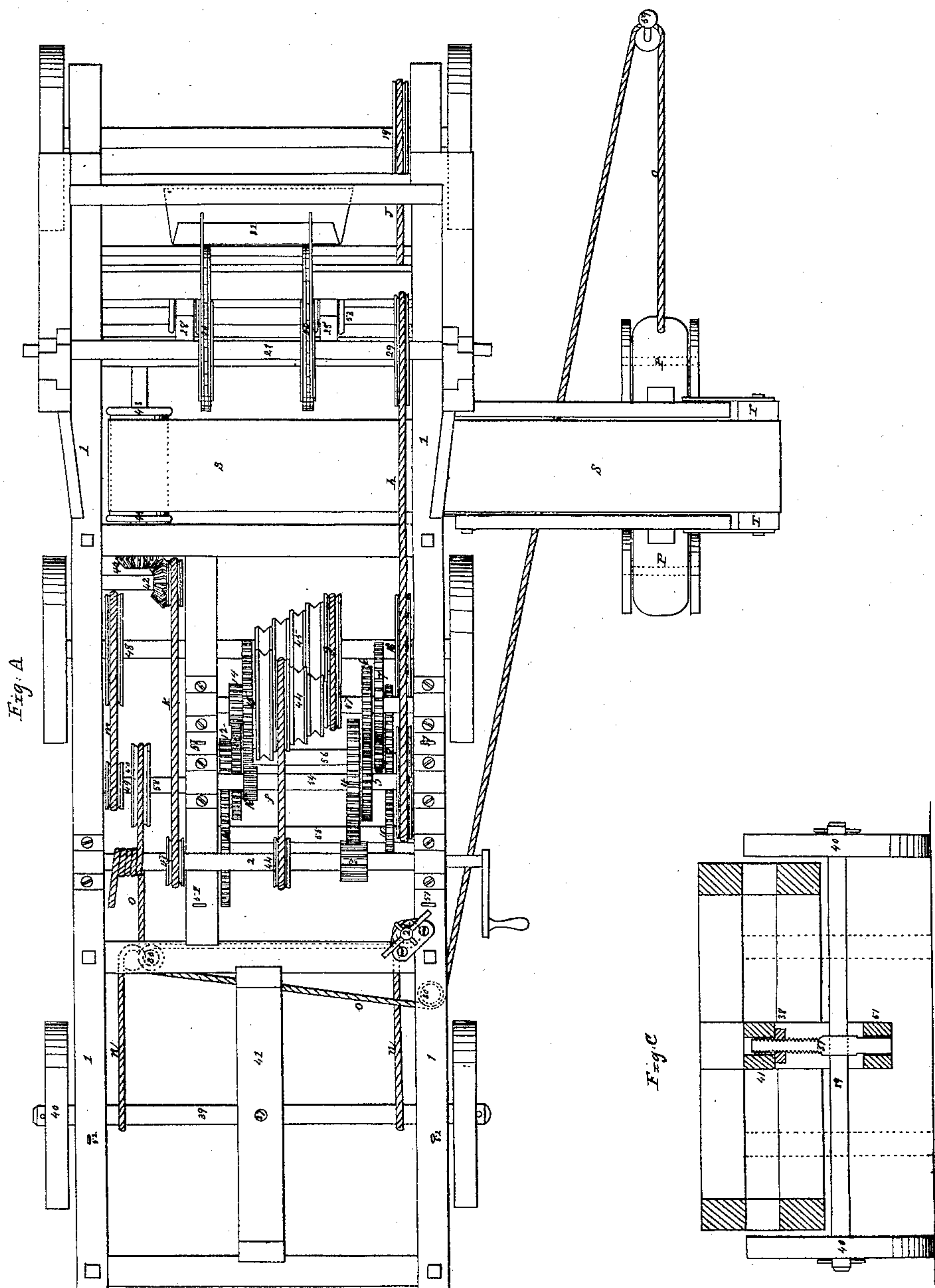
Sheet 1, 2 Sheets.

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Excavator.

N<sup>o</sup> 18,573.

Patented Nov. 10, 1857.



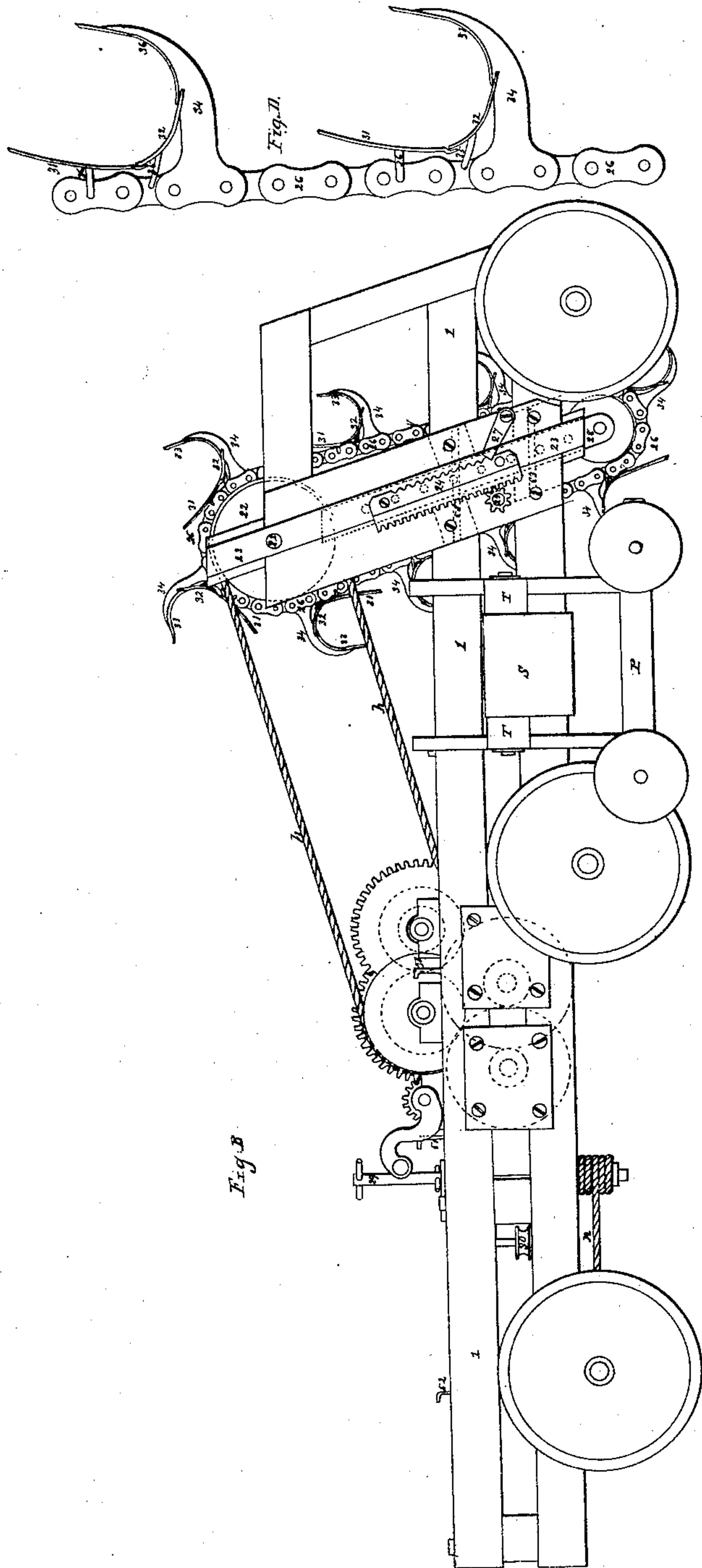
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# UNITED STATES PATENT OFFICE.

JOHN COWDON, OF NEW ORLEANS, LOUISIANA.

## EARTH-MOVING MACHINE.

Specification of Letters Patent No. 18,573, dated November 10, 1857.

*To all whom it may concern:*

Be it known that I, JOHN COWDON, of the city of New Orleans and State of Louisiana, have invented a new and useful Improvement in Machines for Earth-Moving; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and made to form part of this specification, and to the letters and figures of reference marked thereon.

Like letters and figures refer to corresponding parts of the improvement.

The nature of my improvement consists in several parts of the machine to make it complete in its operation,—

Firstly: A combined arrangement of a system of gearing, pulleys, bands, or chains, to give a forward motion to the machine and operate the elevators, and to regulate the motion of the machine to suit the capacity given to the excavators for doing their work, that is, when a shallow cut is taken the motion of the machine will be made more rapid, than when a deep cut is taken,—and to move the machine from place to place independent of any aid excepting the machinery attached thereto, and to go with it at all times, as part of the machine.

Secondly: Constructing the elevators by joining them together in their parts in such a manner, that when the chains to which they are attached pass over the top pulleys, they will expand or spread, and thereby give the dirt a free chance to fall from them into the conveyer. The dirt, as a general thing, will pack itself in the elevators in the process of cutting and elevating, but the manner described of constructing the elevators will readily liberate it, at the proper time.

Thirdly: Carrying the end of the conveyer along with the machine, when the end of it extends too great a distance from the machine to support itself, and which is effected by arranging to the end of the conveyer frame, a carriage and operated by means of a cord from the machine, and with a motion always equal in speed with the motion given to the machine, and with this improvement for carrying the conveyer of the machine, the dirt can be taken any reasonable distance from the machine, and is particularly use-

ful for taking the dirt out of deep and wide ditches.

Fourthly: The manner of arranging and operating the rear axle and wheels of the frame of the machine by which arrangement of parts I am enabled to give the proper or desired direction to the machine when in operation, or when being moved from place to place.

The machine as a general thing is mounted on six wheels, and the manner of arranging the rear axle and wheels, with the frame of the machine enable me to elevate the forward part of the machine, so it will rest on the middle and after wheels, and thus elevated, I can give the machine direction by using the after wheels for steering it, with an arrangement of a windlass and cord with the axis of the rear wheels.

To enable others skilled in the art to make and use my improvement, I will proceed to describe its construction and operation by referring direct to the accompanying drawings, of which,

Figure A represents a top view or plan of the machine in a supposed complete state. Fig. B, is a side elevation of the machine. Fig. C, is a transverse sectional elevation of the frame of the machine of that part to which the rear axle is attached, and Fig. D, is a portion of the elevating chain drawn separate from the machine for more fully showing the manner of constructing the elevator for the purpose before mentioned.

1, 1, represents the frame mounted on six wheels and to which the machinery is attached.

(2) is the main shaft, from which the different parts of the machinery gets its motion excepting the steering apparatus before described.

The gearing consisting of the wheels, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16 and the pulleys 17, 18, 19, 20, 44, 45, and 46, and the cords or chains *f*, *h*, and *J*, are employed for giving and regulating the relative motions of the machine and elevator, in the process of their operation. For instance when the machine is to be moved without working the elevators it is accomplished by means of the pulley 46, transmitting motion to the cone pulley 44, by the cord, *f*, and from that to the cone pulley 45, on the wheel axis with



the cord (*g*) which puts in motion the cord, (J,) that passes around the pulleys, 18 and 19, on the middle and forward wheel axis as represented in Fig. A, and thus give rapid motion to the machine without, as before stated, working the elevators. The next motion of the machine described, will be for taking a shallow cut with the elevators which will admit of a rapid movement of the machine, for instance when it is employed for plowing, or subsoil plowing or shallow ditching, &c.—and is effected with the gear wheel (3), giving motion to the wheel (4) (5) and (6) which operates the cone pulleys (44) and (45), for giving forward motion to the machine, (as before stated)—and the pulley (17) on shaft (54) and cord (*h*) operates the elevating shaft (21) as represented. This speed is sufficiently rapid to move the machine, if desired, without working the elevators. The next motion of the machine described will be for taking a deeper cut with the elevators, and consequently a slower motion of the machine, and is effected with the gear wheel (3) working in the wheel (4) on shaft (54) which gives motion to the pinion (16) that works in wheel (15) on shaft (57) and the pinion (14) attached to the wheel (15) works in wheel (13) which gives motion to the shaft (56) and the pinion (8) on the shaft works in the wheel (7) which gives motion to the cone pulleys (44) for moving the machine forward as before stated. The next and slowest motion given to the machine, and with which motion the deepest cut is taken with the elevators, is effected by the wheel (3) working in the wheel (4) on the shaft (54) which gives motion to the pinion (16) that works in wheel (15) on shaft (57) and the pinion (14) attached to the wheel (15) works in wheel (13) and gives motion to the pinion (12), attached to wheel (13), which works in wheel (11), and gives motion to the shaft (55) and pinion (10) on shaft (55) gives motion to the cone pulley through the wheels 9, 8, and 7, as represented for moving the machine forward as before stated. The elevating shaft in this, as with other motion given to the machine is operated with the pulley (17) and cord (*h*) as before described and represented.

There can be five changes made in the motion of the machine, with the cone pulleys, 44, and 45, for each motion given by the gearing to the elevating shaft 21. The pins 51, 51, are for holding the shafts 55, and 56, in gearing when in operation. The machine will receive its motion from a steam engine that will be attached to the shaft (2.)

The following is a description of the elevators which are attached to the chain 26, and made to pass around the pulleys (22)

on the elevating shaft (21) working in the frame pieces 23, and the chain works around a drum below that revolves in the frame pieces (28,)—which frame pieces are raised and lowered, for making shallow and deep cuts as may be required with the pinion (25), and ratchet (24) placed on each side of the machine, and to prevent the frame from slipping down, the back of the ratchet is furnished with notches, and a pawl (27,) as represented in Fig. B,—and for holding the frame pieces (28,) to their place laterally they are guarded on each side with rod bolts, 53, 53, as fully represented in Fig. A. The improved elevators are composed of several parts—the hook pieces, 34, which are attached to, and made to form part of the chains as represented in Fig. D, and the sheet metal pieces 31, 32 and 33,—the pieces 33, are firmly attached to the hook pieces 34, and the outer edges, of which pieces form the cutters to the elevators,—and the pieces 31, and 32 are attached to the chain links by hook rods 35, and 36, and the edges of the pieces are joined together in such a manner as to admit of a spreading and contracting movement of them,—for instance, in Fig. D, they are shown in a contracted state,—while in Fig. B, they are seen in an expanded state, in passing over the top pulleys, on the elevating shaft (21), for the purpose of freeing the dirt from the elevators, which has been more or less packed in them, in the process of excavating, and by the contracting of the elevators in their passage up to the elevating shaft.

If ever desired, the elevators can be worked on the outside of the machine, which will suit very well in using the machine as a plow, or for excavating in such localities as will not be convenient to work the elevators in the center of the machine,—in such cases the whole machine will operate as represented excepting the elevating shaft, and its attachments, which will extend out to one or both sides of the machine if desired.

The carrier for conveying the dirt away from the machine, drawn up by the elevators is operated by means of the pulley 47, and cord (*h*) giving motion to the gearing 42, 42, as represented in Fig. A, and drum 43, around which drum, the conveying apron is placed and winds over the roll T, attached to the end of the conveying frame as represented, the end of which frame is mounted on the carriage P, which is drawn along by the cord (*o*) attached to the forward end of the carriage, and passing around a friction pulley fixed to the stake 59, ahead of the machine, and the end of the cord is then passed to the after end of the machine, and around the friction rolls 30, 30, as represented, and then around the pulley 50, on



the shaft 58, and as a general thing will be wrapped around the shaft 2, several times for drawing in the slack,—as it winds itself off of the pulley 50, the pulley 50, receives its motion from the pulley 48, on the middle axis of the machine, cord (*m*) and pulley 49, on the shaft 58.

The motion given to the pulley 50, for winding up the cord (*o*) is equal to the forward motion at all times given to the machine with the cord arranged with the machine, and carriage as represented, so that the carriage for carrying the end of the carrier frame will always move with a speed equal to that of the machine.

The stake 59, is to be placed from time to time ahead of the machine as the machine works up to it.

For giving direction and steering the machine the after axle and wheels are arranged with the machine as follows. The after part of the machine is furnished with a frame work 41, and provided with a screw shaft 37, as represented in Fig. (C) and the wheel axis 39, passes through the screw shaft, which is the only connection it has with the frame, and the end of the axles 37, is made capable of vibrating backward and forward and is actuated with the cord (*n*) (*n*) attached to each end of the shaft and windlass apparatus 29, by which arrangement of parts the axle can be moved horizontally sufficient to give direction to the machine, and when very short turns are to be made with the machine, the wheels (40) are placed on the inside of the frame as represented by the dotted lines, which will admit of a greater motion of the axis (39) owing to the wheels having a greater space to move in than when on the outside of the machine, and therefore the machine can be made to make a shorter turn.

When the machine is being moved without doing work the forward part of it will be elevated so that the front wheels will be free from the ground, and the machine will rest on the four hind wheels, which is effected by screwing down the nut (38) on the shaft (37) which causes the after part of the frame of the machine to fall, as it will be the heaviest, when the engine is attached to it for operating the machine,—and with the machine thus resting on the four hind wheels, and steered by the two hind ones,

and axle, it is much easier to move and give direction to the machine, than if moved on all six wheels.

When the machine is being moved without doing work, the conveyer frame, and carriage P, attached to the frame with its attachments will be laid on the machine.

The conveyer frame mounted on the carriage P, if desired can be made in sections, and long enough when put together, to carry the dirt fifty, seventy five feet or a greater distance from the machine.

What I claim as my improvement and desire to secure by Letters Patent is—

1. The combined arrangement of the gear wheels, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16, and pulleys, 17, 18, 19, 20, 44, 45, and 46, and the chains or cords, *f*, *h*, and *J*, all arranged on the shafts as represented, or substantially the same, and for the purpose of giving and regulating the forward motion of the machine and movement of the elevators in the manner and for the purposes mentioned in the foregoing specification.

2. I also claim the construction of the elevators by dividing them into three, more or less, pieces and arranging the pieces 31, 32, and 33, to the chain 26, and hook pieces 34, as specified and represented or substantially the same for the purpose of causing them to expand or spread, for freeing the dirt from the elevators when being discharged in the manner, and for the purposes specified in the foregoing specification.

3. I also claim the combination and arrangement of the parts with and employed for carrying the end of the conveyer frame, consisting of the carriage P, cord (*o*) and pulley stake 59, friction rolls, 30, 30, and driving pulley 50, or substantially the same operated in the manner and for the purposes specified in the foregoing specification.

4. I also claim the combined arrangement of the shaft 37, nut 38, wheel axis 39, with the frame work 41, as represented for elevating and lowering the rear end of the frame of the machine preparatory for steering and giving the machine direction as specified in the foregoing specification.

JOHN COWDON.

Witnesses:

CHARLES H. FOX,  
M. BENSON.