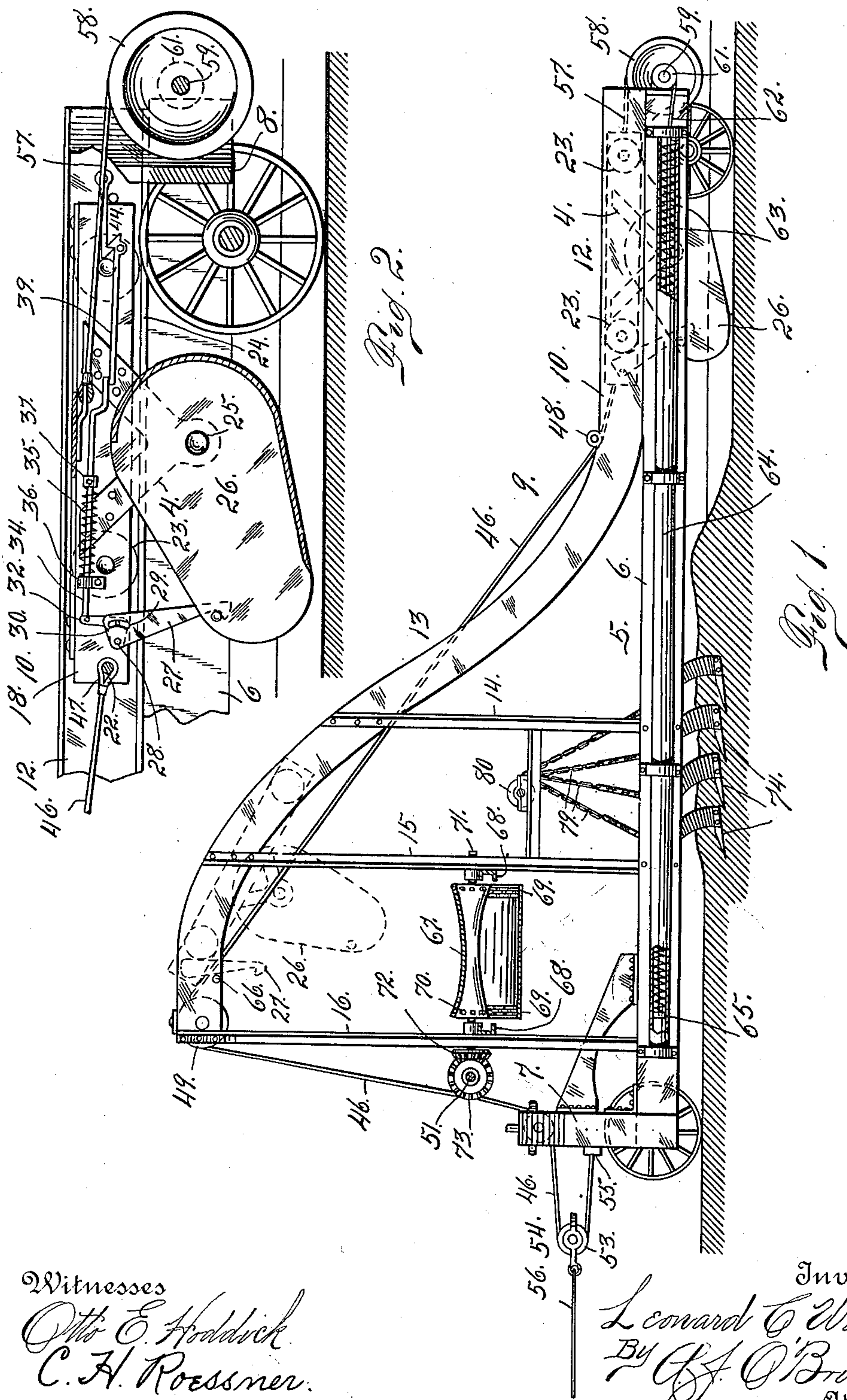


987,660.

L. C. WOOD.
EXCAVATING MACHINE.
APPLICATION FILED APR. 16, 1910.

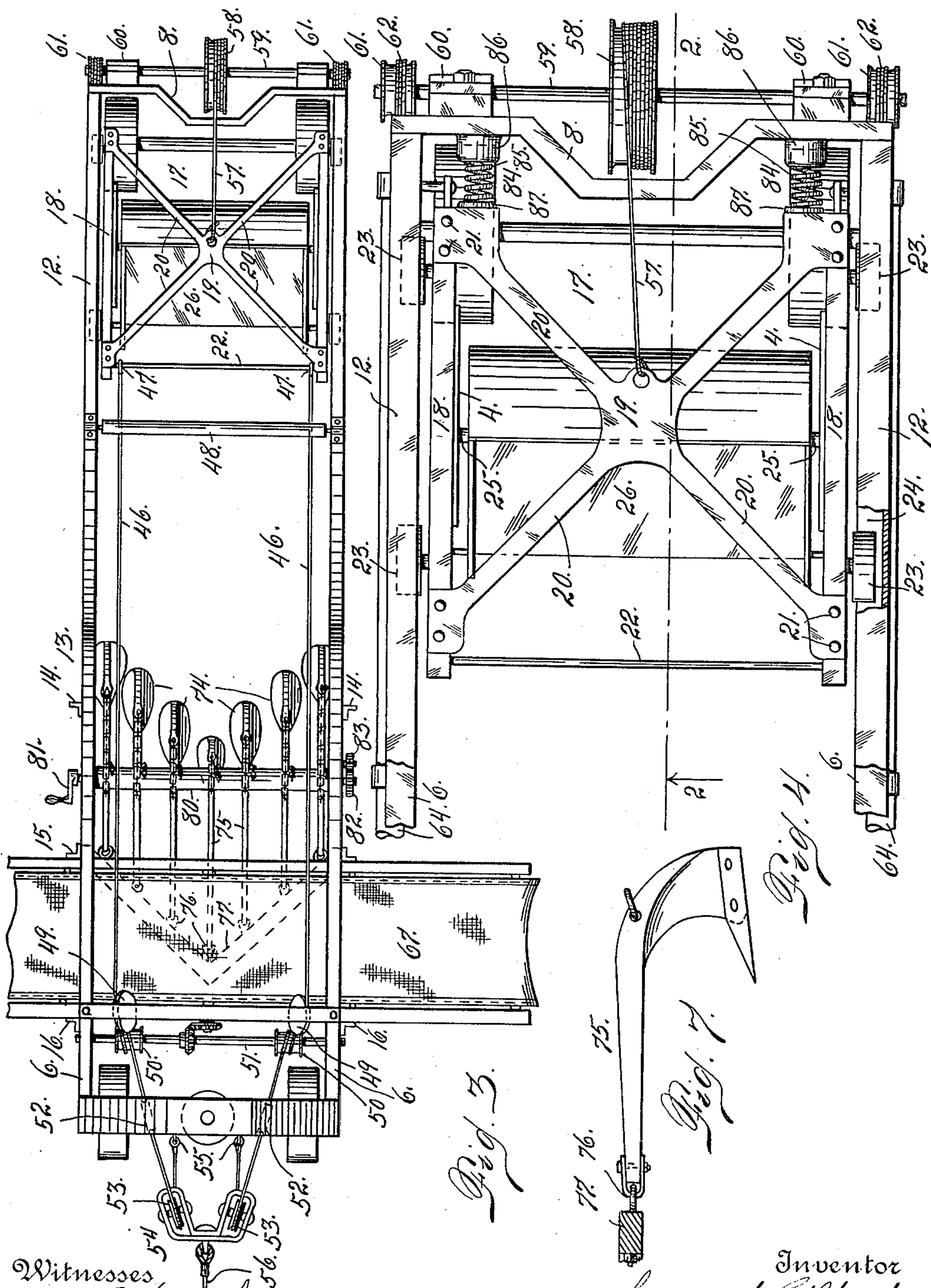
Patented Mar. 21, 1911.

3 SHEETS—SHEET 1.



Witnesses
Otto E. Hoddick
C. H. Roessner.

Inventor
Leonard C. Wood.
By *A. J. O'Brien*
Attorney



Witnesses
Otto E. Hoddvick.
C. H. Rossoner.

Inventor
Leonard C. Wood.
By J. O'Brien.
Attorney

987,660.

L. C. WOOD.
EXCAVATING MACHINE.
APPLICATION FILED APR. 16, 1910.

Patented Mar. 21, 1911.

3 SHEETS—SHEET 3.

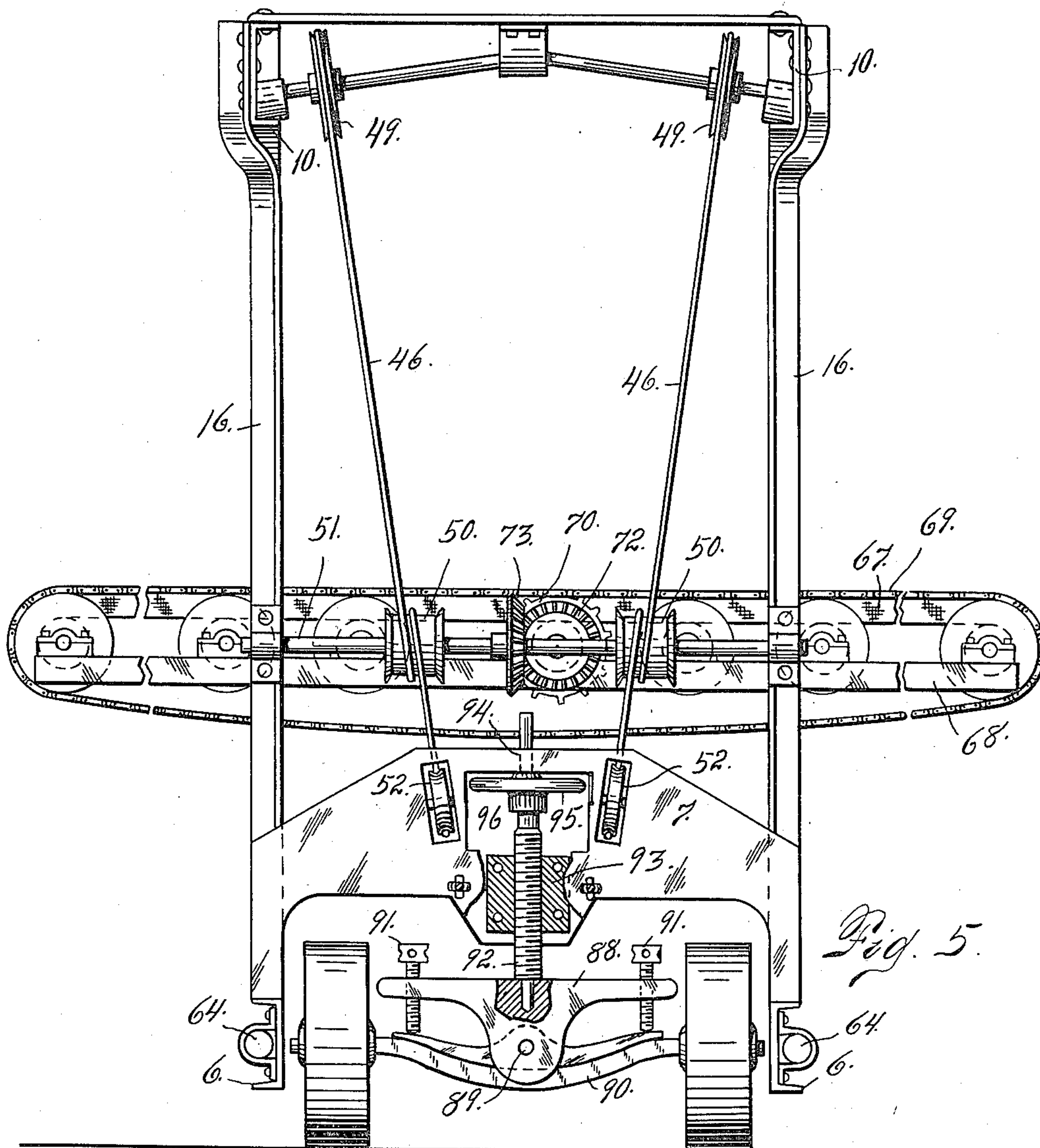


Fig. 5.

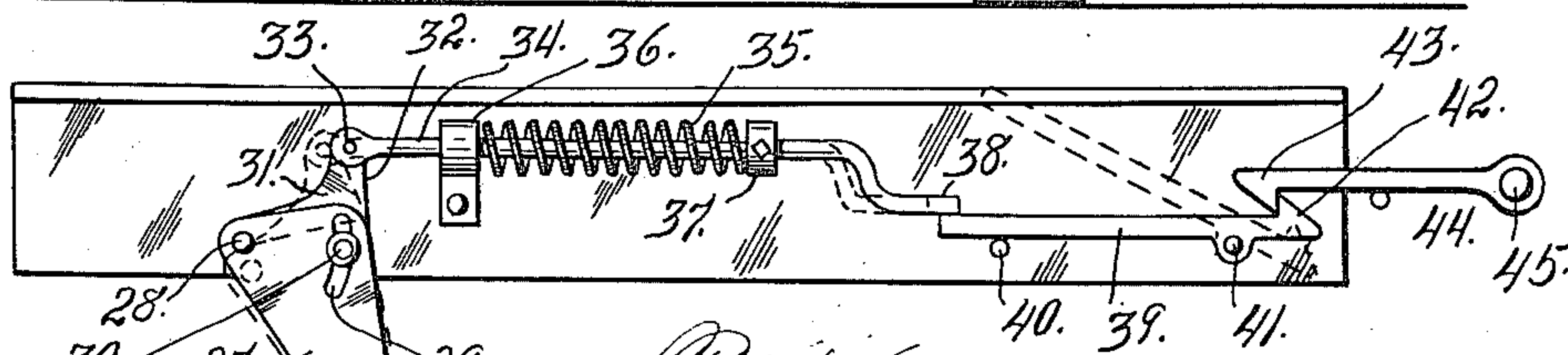


Fig. 6.

Witnesses
Otto E. Hoddick.
C. H. Roesser.

Inventor
Leonard C. Wood.
By *J. O'Brien.*
Attorney

UNITED STATES PATENT OFFICE.

LEONARD C. WOOD, OF DENVER, COLORADO.

EXCAVATING-MACHINE.

987,660.

Specification of Letters Patent.

Patented Mar. 21, 1911.

Application filed April 16, 1910. Serial No. 555,817.

To all whom it may concern:

Be it known that I, LEONARD C. WOOD, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Excavating-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to excavating machines, more especially adapted to be employed in street grading, and which may be employed for general purposes of excavating.

Generally explained, my improved construction comprises a vehicle, upon which are mounted plows for loosening the dirt. Mounted upon the vehicle in the rear of the plows, is a bucket which is normally fixedly connected with the vehicle and travels therewith, and adapted by the force of the dirt into which it moves, to automatically disconnect or unlock itself from the rear portion of the vehicle, in which event the power which normally serves to move the vehicle forward, acts upon the bucket, by virtue of the principle of exerting itself in the line of the least resistance, and causes the bucket with its load to travel upwardly through a suitable track, and automatically dump itself when it has reached the desired elevation. Below the bucket, and adapted to receive the discharge therefrom, is a belt or apron transversely arranged. The upward movement of the bucket, by virtue of suitable connections, places springs under tension, and as soon as the bucket has been dumped, the recoil of the said springs returns the bucket with its truck to its normal position, where it is automatically locked and ready to receive the next load. It will be understood that the power which is connected with the excavator, continues to act until the bucket has reached its upper limit of movement, when it is released, the cable being allowed to slacken during the rearward or return movement of the bucket.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accom-

panying drawings, in which is illustrated an embodiment thereof.

In these drawings: Figure 1 is a side elevation of my improved machine. Fig. 2 is a fragmentary sectional view of the rear portion of the machine shown on a larger scale. This is a section taken on the line 2—2 of Fig. 4. Fig. 3 is a top plan view of the construction, on approximately the same scale as shown in Fig. 1. Fig. 4 is a fragmentary plan view of the rear portion of the machine shown on a larger scale. Fig. 5 is a front end elevation of the machine shown partly in section, and on a larger scale than in Figs. 1 and 3. Fig. 6 is a detail view of the mechanism, for interlocking the bucket carriage with the framework of the vehicle.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the framework or body of the vehicle, which as illustrated in the drawings, includes two parallel side bars 6 connected at their forward extremities by a yoke 7, and at their rear extremities by a transverse angular frame bar 8.

Mounted above the vehicle frame and having its rear portion resting directly thereon, is a track 9, composed of separated channel bars 10 whose rear portion 12 is parallel with the vehicle frame. From the forward extremity of this rear portion, the track extends upwardly, constituting the curved member 13 of the track, the opposite side bars being supported at suitable intervals by posts 14, 15, and 16 mounted on the vehicle frame, their upper extremities being secured to the outer surfaces of the track members. Normally occupying a position in the rear portion 12 of this track, is a carriage 17 composed of two parallel side bars 18 connected by a spider plate 19, having four radial arms 20 extending from the central portion of the plate, their outer extremities being secured to the bars of the carriage frame by suitable fastening devices 21. The forward extremity of the carriage frame is also provided with a transverse rod 22, which serves to connect the side bars 18, and further strengthen the frame which is mounted on the wheels 23, engaging the lower flanges 24 of the channel members of the carriage track.

Secured to the side members 18 of the carriage frame, are depending V-shaped brack-

ets 4, upon which are trunnions 25, upon which the bucket 26 is pivotally mounted near its rear extremity. The forward extremity of the bucket is supported by latches 5 27, one on each side and pivotally connected with the bell crank lever 31 as shown at 28. The upper portion of each of these rods is slotted as shown at 29 to receive the fulcrum pin 30 of a bell-crank lever 31. One arm 10 of this lever is connected with the latch by the pivot pin 28, while its opposite arm 32 is connected as shown at 33 with a rod 34 carrying a coil spring 35 which engages a stop 36 fastened to the carriage frame, and an adjustable stop 27 mounted on the rod. The 15 stop 36 is provided with an eye through which the rod passes. By virtue of its construction and arrangement, the tension of the spring 35 has a tendency to move the rod 34 rearwardly, and by its peculiar action on the 20 bell-crank lever, serves to maintain the latch in its interlocking relation with the bucket. The rear extremity of the rod 34 is bent slightly downward as shown at 38, and normally engages the forward extremity of a 25 latch 39, whose forward end rests upon a pin 40, mounted on the carriage frame. The rear portion of the latch 39 is pivoted on the frame at 41. The rear end of this latch is provided with a hook 42, which normally interlocks with a hook 43, formed on the forward 30 extremity of a latch 44, pivotally connected with the framework of the vehicle, as shown at 45. As the bucket enters the earth, the pull incident to such action acts upon the 35 latch 27 through the bell-crank lever 31 to pull the rod 34 forwardly against the tension of its spring 35, sufficiently to release the rear extremity 38 of the said rod from the forward extremity of the latch 39, thus 40 allowing the latter to swing on its fulcrum 41, under the pull of the latch 44, to the dotted line position, whereby it is disengaged from the holding latch 44, connected with 45 the vehicle frame, as aforesaid.

To the forward rod 22, of the bucket-carriage, are connected as shown at 47, two 50 cables 46, which pass under a guide roller 48, and thence upwardly over the guide pulleys 49 mounted on the upper part of the track 9. These cables after passing over the 55 guide pulleys, extend downwardly and pass around the drums 50, mounted upon a shaft 51, and pass thence under the guide pulleys 52, and thence around the pulleys 53 carried by a movable pulley-holder 54, the ends of the cables passing thence to the forward 60 end of the vehicle frame where they are secured as shown at 55. A cable 56 is also connected with the pulley-holder 54, and extends forwardly to an engine or other suitable source of power, (not shown.)

Connected with the central portion of the spider plate 20 of the bucket-carriage is a 65 cable 57 which leads rearwardly to a drum

58, fast on a shaft 59, journaled in bearings 60, mounted on the rear extremity of the vehicle frame. On each end of the shaft 59, is mounted and made fast a small drum 61. 70 With each of these drums is connected a relatively small cable 62, which normally extends forwardly through a coil spring 63 located in a casing 64, mounted on the vehicle frame. The forward extremity of this 75 cable is connected with the piston 65 which engages the forward extremity of the spring, its rear extremity engaging a stop at the rear end of the tube on the casing 64. During 80 the forward movement of the bucket-carriage, the cable 57 is unwound from the drum 58, while the cables 62 are wound upon the drum 61, and during this operation it is evident that the spring-compressing 85 pistons 65 will be moved rearwardly, whereby the springs 63 are placed under tension. When the bucket-carriage reaches its upper 90 limit of movement, the latches 27 are caused to engage a stop rod 66, above the lower extremity of the latches, whereby the latter are disengaged from the forward extremity of 95 the bucket, which in that event, turns upon its trunnions to the dumping position, indicated by the dotted lines in Fig. 1. As soon as this occurs, the power cable 56 is released 100 at the engine (not shown), whereby the recoil of the springs 63 acts to reverse the movement of the bucket-carriage, whereby the latter is caused to move downwardly in 105 the track 10 to its original position, its latch 39 automatically engaging its companion latch 44, whereby the carriage is again locked at its rearward limit of movement 110 during the return movement of the bucket-carriage down the inclined track, the latch 27 is tilted toward the bucket and the bucket is tilted into engagement with the latch by 115 the ground before the carriage enters upon the horizontal portion of the track. After the bucket has reached its upper limit of movement, as heretofore explained, its contents are discharged on a transversely arranged 120 conveyer belt 67, mounted upon a frame 68, the outer edges of the belt being equipped with sprocket chains 69, engaging centrally located sprocket wheels 70, mounted 125 on a shaft 71, which is actuated through the medium of gears 72 and 73, the gear 72 being fast on the shaft 71 and the gear 73 fast on the transverse shaft 51, carrying the drums 50.

Mounted on the vehicle frame forward of the bucket, is a series of plows 74, each of which is provided with a forwardly extending arm 75, movably connected as shown at 76 with a V-shaped beam 77. Connected 130 with the rear portion of each plow, as shown at 78, is a chain 79. The chains of the series of plows pass upwardly over the roller 80 upon which they are adapted to wind for the purpose of raising them while traveling 135

from place to place when the machine is not in use. Upon one extremity of the roller or windlass 80, is a hand-crank 81 to facilitate the raising and lowering of the plows.

5 On the opposite end of the roller is a ratchet wheel 82 with which a pawl 83, mounted on the framework, coöperates for the purpose of maintaining the roller and its connections in the proper position of adjustment.

10 At the rear extremity of the bucket-carriage-track are located two buffers 84, composed of springs 85, engaging abutments 86, mounted on the cross-bar 8. The forward extremities of these buffers are provided with disks or caps 87, forming a bearing surface for the rear portion of the carriage, when at its rearward limit of movement.

20 From the foregoing description the use and operation of my improved excavator will be readily understood. It must be assumed that an engine or suitable source of power (not shown), is located or stationed at a suitable point in front of the machine.

25 The power cable 56 is connected with this engine and the machine is drawn forwardly a suitable distance. During this forward movement the plows loosen the ground in front of the bucket. During this time the bucket-carriage remains relatively stationary upon the traveling vehicle. As soon, however, as the bucket enters the earth, the downward pull, incident to such engagement, acts upon the latch 27, with sufficient

35 force to operate the bell-crank lever 31, which acts on the rod 34, and moves the latter forward sufficiently to disengage its rear extremity from the latch 39, allowing the latter to assume the position shown in dotted lines (see Fig. 6), whereby the bucket-carriage is released from the vehicle frame. The pull upon the cable 56 now ceases to move the vehicle, and acts upon the bucket-carriage, since the latter affords less resistance than the entire vehicle, with the result that the bucket-carriage moves forwardly to the upper extremity of the track 13, where the latches 27 are disengaged from the forward end of the bucket by virtue of their engagement with the stop rod or bearing 66.

50 The front end of the bucket then moves downwardly allowing its contents to fall upon the transversely arranged conveyer-belt 67. It will be understood that during the forward travel of the bucket and its carriage, the conveyer belt is actuated by virtue of the engagement of the cables 46 with the drums 50 on the shaft 51, motion being communicated to the belt through the instrumentality of the gears 73 and 72. Now, as soon as the bucket has discharged its contents on the belt, the cable 56 is released, and the recoil of the springs 63 acts upon the bucket-carriage to return the latter to its normal position, whereby it is again

locked upon the vehicle frame, through the medium of the latches 39 and 44, as heretofore explained. During the rearward travel of the bucket-carriage, the conveyer belt is actuated, through the medium of the connections heretofore explained, sufficiently to discharge the dirt carried thereby at one side of the machine.

The forward extremity of the machine is provided with a leveling bolster 88, pivotally connected as shown at 89 with the forward axle 90 of the running gear of the vehicle. Threaded in each extremity of the bolster is a screw 91, whose lower extremity engages the axle, thus making it practicable to accurately level the bolster. Journaled in the central portion of this bolster, is a screw 92 threaded in a nut 93, mounted in the framework of the structure. The upper extremity of this screw is journaled in the yoke 7, as shown at 94. The screw is provided with an operating hand wheel 95, which passes through an opening 96 formed in the yoke, and protrudes on both sides thereof to facilitate manipulation. This hand wheel is splined on the screw shaft to allow it to travel upwardly and downwardly if necessary. The function of this screw shaft is to raise and lower the body or framework of the vehicle, with reference to the running gear thereof.

Having thus described my invention, what I claim is:

1. The combination with a vehicle, of a bucket normally locked against movement in relation to the vehicle when at its rearward limit of movement, means connected with the bucket and vehicle for imparting forward travel to the latter, and means for releasing the bucket to allow it to travel independently of the vehicle.

2. In an excavator, the combination with a vehicle, of a carriage normally locked thereon, a bucket trunnioned on the carriage, a track for said carriage mounted on the vehicle and extending forwardly and upwardly from the rear portion thereof, a cable having one extremity connected with the vehicle and the other extremity connected with the bucket carriage, means for applying power to the cable intermediate its extremities, the cable being free to travel on said means, and an operative connection between the bucket and the means for locking the bucket upon the vehicle, whereby as the bucket enters the earth the downward pull upon its lower portion will release the carriage and allow the latter to travel forwardly and upwardly in its track in relation to the vehicle while the latter ceases to move.

3. In an excavator, the combination of a suitable framework mounted on wheels and including a track extending upwardly from the rear portion of the structure and ter-

minating at an elevated point at its forward extremity, a carriage constructed to travel on said track, a bucket trunnioned on the carriage, means for normally locking the carriage on the framework of the structure, a connection between the bucket and the locking mechanism, whereby the downward pull on the bucket resulting from the latter's entering the earth will release the carriage, a cable connected with the carriage at one extremity and with the framework of the structure at the other extremity, a traveling device engaging the cable intermediate its extremities and connected with suitable power for operating purposes, whereby as the power is applied to the traveling device the structure will be moved bodily in the first instance, after which the carriage will be automatically released through the agency of the bucket and allowed to travel forwardly and upwardly in its track in relation to the vehicle or while the latter remains stationary.

4. The combination of a vehicle, including a carriage track extending forwardly and upwardly, a carriage adapted to travel on said track, the carriage being normally locked against travel in relation to the vehicle, a flexible device connected with the bucket carriage at one extremity and with the body of the vehicle at its opposite extremity, a traveling device engaging the cable intermediate its extremities and connected with suitable power for operating the machine, a bucket trunnioned on the carriage, and an operative connection between the bucket and the carriage locking device, whereby as the bucket enters the earth the carriage is automatically released and allowed to travel forwardly on its track independently of the travel of the vehicle, substantially as described.

5. The combination of a vehicle, having a framework thereon, including a carriage track extending forwardly and upwardly from the rear portion of the vehicle, a carriage adapted to travel on said track, means for normally locking the carriage against travel in relation to the vehicle, a bucket trunnioned on the carriage, a flexible device connected with the bucket carriage at one extremity and with the body of the vehicle at its opposite extremity, an antifrictional device engaging the cable between its two points of connection and connected with power for operating purposes, and an operative connection between the bucket and the carriage-locking means for automatically releasing the carriage, substantially as described.

6. The combination of a vehicle having a body, including a carriage track extending forwardly and upwardly, a carriage adapted to travel on said track, a bucket trunnioned on the carriage, means for normally locking

the carriage against travel in relation to the vehicle, an operative connection between the bucket and said locking mechanism for automatically releasing the carriage, a flexible device connected at one extremity with the bucket carriage and at its opposite extremity with the body of the vehicle, and means for applying power to the cable intermediate its extremities whereby the vehicle is initially moved bodily until the action of the bucket releases the carriage.

7. In an excavator, the combination of a vehicle having a track extending upwardly and forwardly from the rear portion thereof, a carriage mounted to travel on said track, means for normally locking the carriage against travel on the track in relation to the vehicle, a bucket trunnioned on the carriage, a power cable connected at one extremity with the carriage and at its opposite extremity with the body of the vehicle, means for applying power to said cable intermediate its extremities and an operative connection between the bucket and the carriage-locking mechanism, whereby the latter is automatically released after the vehicle has reached its forward limit of movement, and the bucket brought into engagement with the material to be handled.

8. The combination of a vehicle having a body, including a carriage track extending upwardly and forwardly from the rear portion thereof, a carriage adapted to travel on said track and normally spring-retained at its rearward limit of movement, means for locking the carriage against travel on the track when in its normal position, a bucket trunnioned on the carriage, a flexible device connected at one extremity with the bucket carriage and at its opposite extremity with the body of the vehicle, means for applying power to said cable intermediate its extremities whereby the vehicle is initially caused to travel bodily, and an operative connection between the bucket and the carriage-locking mechanism for automatically releasing the carriage when the initial travel of the vehicle has been sufficient to bring the bucket into engagement with the material to be handled.

9. The combination of a vehicle having a body member including a carriage track extending upwardly and forwardly from the rear portion thereof, a bucket trunnioned on said track, means for normally locking the carriage against movement on the track in relation to the vehicle, a cable connected with the carriage at one extremity and with the body of the vehicle at its opposite extremity, means for applying power to the cable intermediate its extremities, a latch pivotally connected with the carriage at its upper extremity and engaging the bucket at its lower extremity, and an operative connection between said latch and the carriage

locking mechanism, whereby as the bucket is subjected to a downward pull by its engagement with the material to be handled, the carriage locking mechanism is automatically released, whereby the operating power is exerted on the carriage and the latter carried forwardly and upwardly on its track, and means for automatically disengaging the bucket latch as the carriage reaches its predetermined limit of upward travel, allowing the bucket to swing downwardly for dumping purposes, substantially as described.

10. The combination of a vehicle, having a carriage track mounted thereon, a cable connected with the carriage from the rear and normally spring-actuated to hold the carriage at its rearward limit of movement, means for locking the carriage on its track against movement in relation to the vehicle, a bucket trunnioned on the carriage, a latch pivotally connected with the carriage and engaging the forward portion of the bucket for supporting the latter in position to be filled, an operative connection between the said latch and the carriage-locking mechanism, for automatically releasing the carriage when the bucket has entered the earth incident to its travel with the vehicle, and means located at the upper extremity of the carriage track for releasing the latch from the bucket and allowing the latter to dump, a transversely arranged conveyer mounted on the body of the vehicle to receive the contents of the bucket, a cable having one extremity connected with the carriage, and its other extremity connected with the body of the vehicle, and means for applying power to the cable intermediate its extremities whereby the vehicle is initially moved bodily until the carriage is released, and an operative connection between the conveyer and the cable, whereby the conveyer is operated during the movement of the carriage, substantially as described.

11. An excavator, comprising a vehicle equipped with means for loosening the earth, a bucket located in the rear of the earth-loosening means, the vehicle being also equipped with a track upon which the bucket is adapted to travel, means for normally locking the bucket against travel independently of the vehicle, a flexible device connected at one extremity with the bucket and at its opposite extremity with the body of the vehicle, means for applying power to the cable intermediate its extremities, and means actuated by the bucket as it enters the earth for automatically releasing the latter and allowing it to travel on its track in relation to the vehicle, substantially as described.

12. The combination of a vehicle, having a track, a carriage arranged to travel on the track and having a bucket trunnioned thereon, means for normally locking the bucket

carriage against travel on the track, a flexible device connected with the bucket carriage at one extremity and with the vehicle body at its opposite extremity, means for applying power to the flexible device intermediate its extremities, and means actuated from the bucket for automatically releasing the bucket carriage-locking mechanism to allow the carriage to move forwardly on its track in response to the pull of the cable, substantially as described.

13. An excavator, comprising a vehicle having a track mounted thereon and carrying earth-loosening means, a bucket located in the rear of the earth-loosening means, a carriage for the bucket adapted to travel on the said track, the carriage being normally spring-held at the rearward extremity of the track, means for normally locking the carriage at the rear extremity of the track, a cable connected with the carriage at one extremity and with the body of the vehicle at its opposite extremity, means for applying power to the cable intermediate its extremities, and a connection between the bucket and the carriage-locking mechanism for automatically releasing the carriage as the bucket enters the earth, whereby the bucket and its carriage are caused to travel forwardly on the track, and means for automatically dumping the bucket when it has reached its forward limit of track movement, substantially as described.

14. An excavator, comprising a vehicle having a track, a bucket, a carriage upon which the bucket is mounted, the carriage being normally held against movement on the rear end of the track and adapted to travel on the track when released, a cable connected at one extremity with the carriage and at its opposite extremity with the vehicle body, means for applying power to the cable intermediate its extremities, the cable being free to travel on the power-applying device, and means operated from the bucket as the latter enters the earth for automatically releasing the carriage from the track, substantially as described.

15. The combination of a vehicle having a carriage track, coil-springs mounted on opposite sides of the vehicle, a carriage mounted on the vehicle to travel on said track, cables connected at their forward extremities with pistons serving to compress the springs in response to a rearward pull on the cables, drums mounted on the rear extremity of the vehicle with which the spring-compressing cables are connected, an operative connection between the carriage and the said cables, whereby as the carriage moves forwardly the cables are wound on the drums to compress the said springs, a bucket mounted on the carriage, means for normally locking the carriage against movement on its track, means connected with the locking mechanism

nism for releasing the carriage, and means connected with the vehicle and with the carriage for moving the carriage forwardly on its track while the vehicle remains stationary after the carriage is released, substantially as described.

16. An excavator, comprising a vehicle having a carriage track, a carriage mounted to travel on said track, a bucket mounted on the carriage, means for locking the carriage against movement on its track, an operative connection between the bucket and the carriage-locking mechanism for automatically releasing the carriage as the bucket fills with earth, a flexible device connected at one extremity with the carriage and at its opposite extremity with the vehicle, and means for applying power to the flexible device intermediate its extremities, whereby the vehicle is initially actuated but as soon as the bucket carriage is released the power is exerted through the line of least resistance to move the carriage forwardly on its track, substantially as described.

17. An excavator comprising a vehicle, having a track, a scraper-bucket, a carriage upon which the bucket is mounted, the carriage being adapted to travel on the track but normally locked against movement, a cable connected at one extremity with the carriage and at its opposite extremity with the vehicle body, means for applying power to the cable intermediate its extremities, the cable being free to travel on the power applying device, and means for releasing the carriage to allow the cable to actuate the carriage and bucket-scraper while the vehicle body remains stationary, substantially as described.

18. An excavator comprising a vehicle, having a track, a scraper-bucket mounted to travel on the track, but normally locked against action, a cable connected at one extremity with the scraper-bucket and at its opposite extremity with the vehicle body, means for applying power to the cable intermediate its extremities, the cable being free to travel on the power-applying device, and means for releasing the scraper-bucket to allow it to move forward on the track in response to the pull of the cable while the ve-

hicle body remains stationary, substantially as described.

19. An excavator comprising a vehicle having a track, a scraper-bucket adapted to travel on the track, but normally locked against movement at the rear extremity of the track, a cable connected at one extremity with the scraper-bucket and at its opposite extremity with the vehicle body, means for applying power to the cable intermediate its extremities for the purpose of imparting initial travel to the vehicle body, the cable being free to travel on the power-applying device, means for releasing the scraper bucket to allow it to travel forwardly on the track, and means for automatically returning the scraper-bucket to its normal rearward position, substantially as described.

20. An excavator comprising a vehicle having a track, a scraper-bucket mounted to travel on the track, but normally locked against movement in relation to the vehicle at the rear extremity of the track, a cable connected at one extremity with the scraper-bucket and at its opposite extremity with the vehicle body, means for applying power to the cable intermediate its extremities to impart initial travel to the vehicle body, the cable being free to run on the power applying device, means for automatically releasing the scraper-bucket as the latter enters the earth to be handled, whereby the bucket is allowed to travel forwardly on the track, and means for automatically returning the scraper-bucket to its normal position, for the purpose set forth.

21. An excavator comprising a vehicle having a track, a scraper bucket mounted to travel on the track, but normally locked against movement in relation to the vehicle, a cable connected with the scraper bucket and with the vehicle body, means for applying power to the cable to impart initial travel to the vehicle body, and means for releasing the scraper bucket.

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

LEONARD C. WOOD.

Witnesses:

A. J. O'BRIEN,
ELIZABETH BOWEN.