No. 823,855. PATENTED JUNE 19, 1906.

W. GILMORE.

UNIVERSAL EXCAVATING AND GRADING MACHINE.

APPLICATION FILED AUG. 26, 1905.

5 SHEETS—SHEET 1.

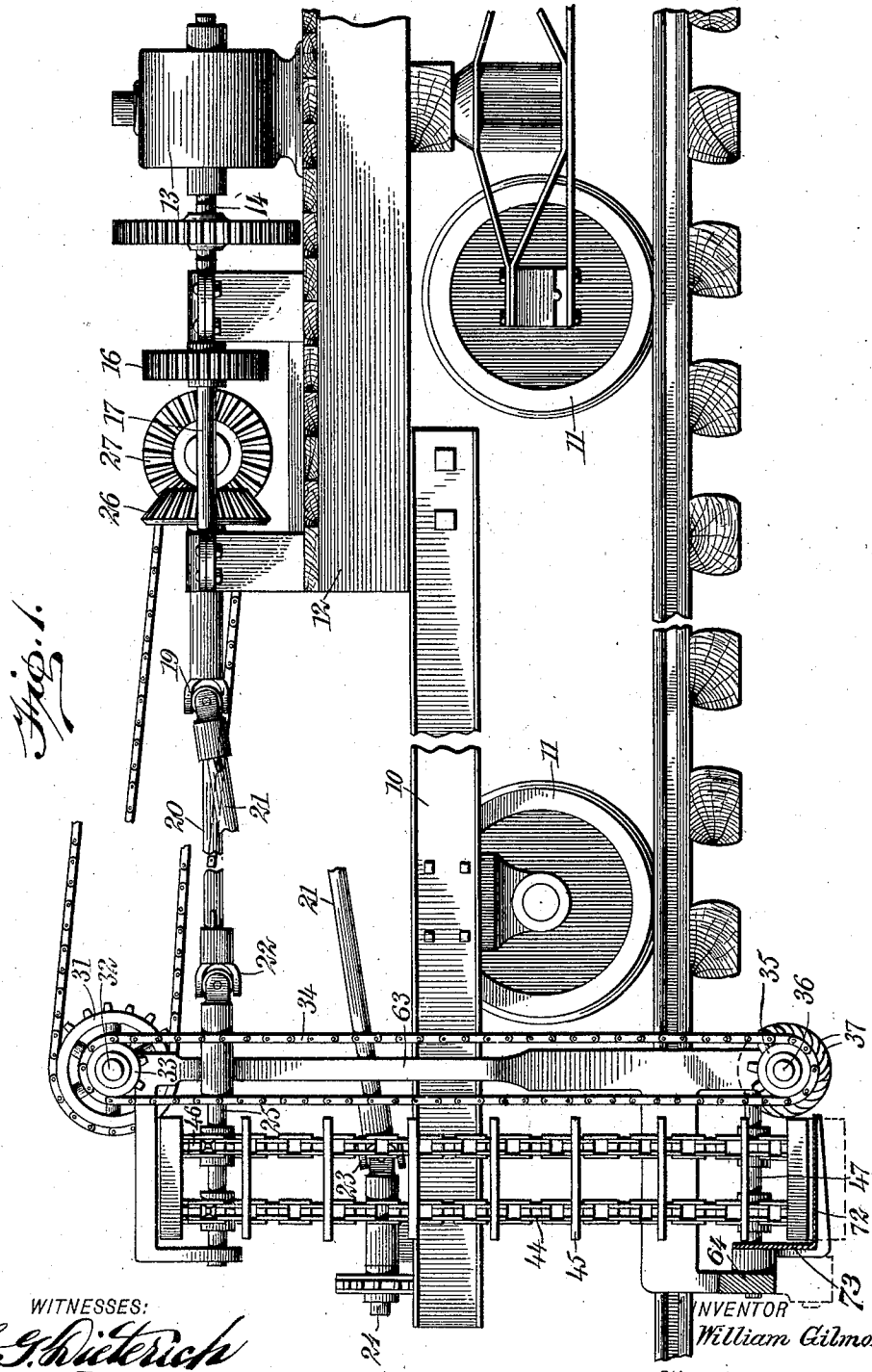


Fig. 1.

WITNESSES:

H. G. Dieterich

A. E. Fay.

INVENTOR

William Gilmore

BY

ATTORNEYS

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

No. 823,855. PATENTED JUNE 19, 1906.

W. GILMORE.

UNIVERSAL EXCAVATING AND GRADING MACHINE.

APPLICATION FILED AUG. 26, 1905.

5 SHEETS—SHEET 2.

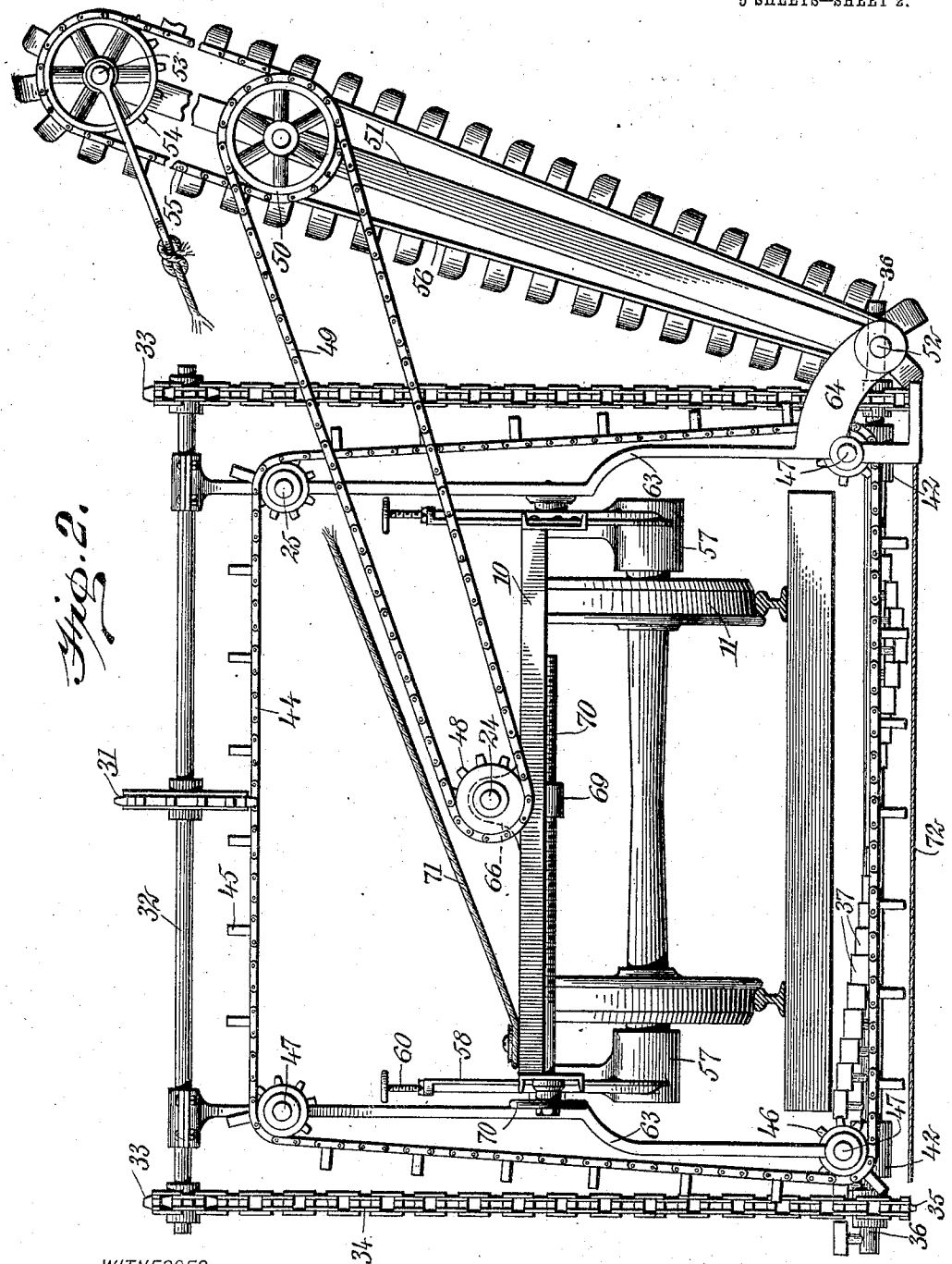


Fig. 2.

WITNESSES:

H. G. Dieterich

A. E. Fay.

INVENTOR

William Gilmore

BY

ATTORNEYS

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

No. 823,855. PATENTED JUNE 19, 1906.

W. GILMORE.

UNIVERSAL EXCAVATING AND GRADING MACHINE.

APPLICATION FILED AUG. 26, 1905.

5 SHEETS—SHEET 3.

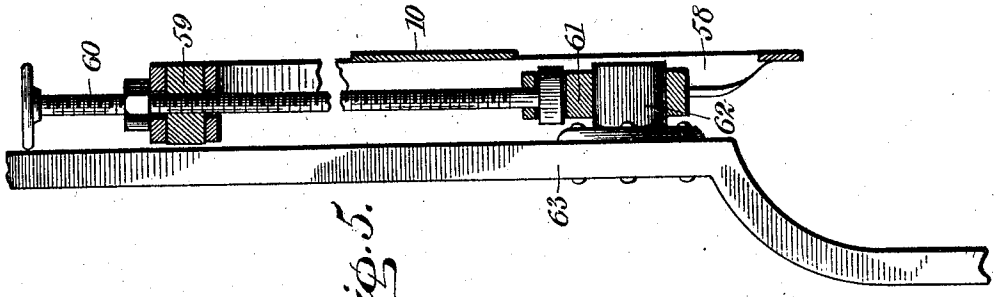


Fig. 5.

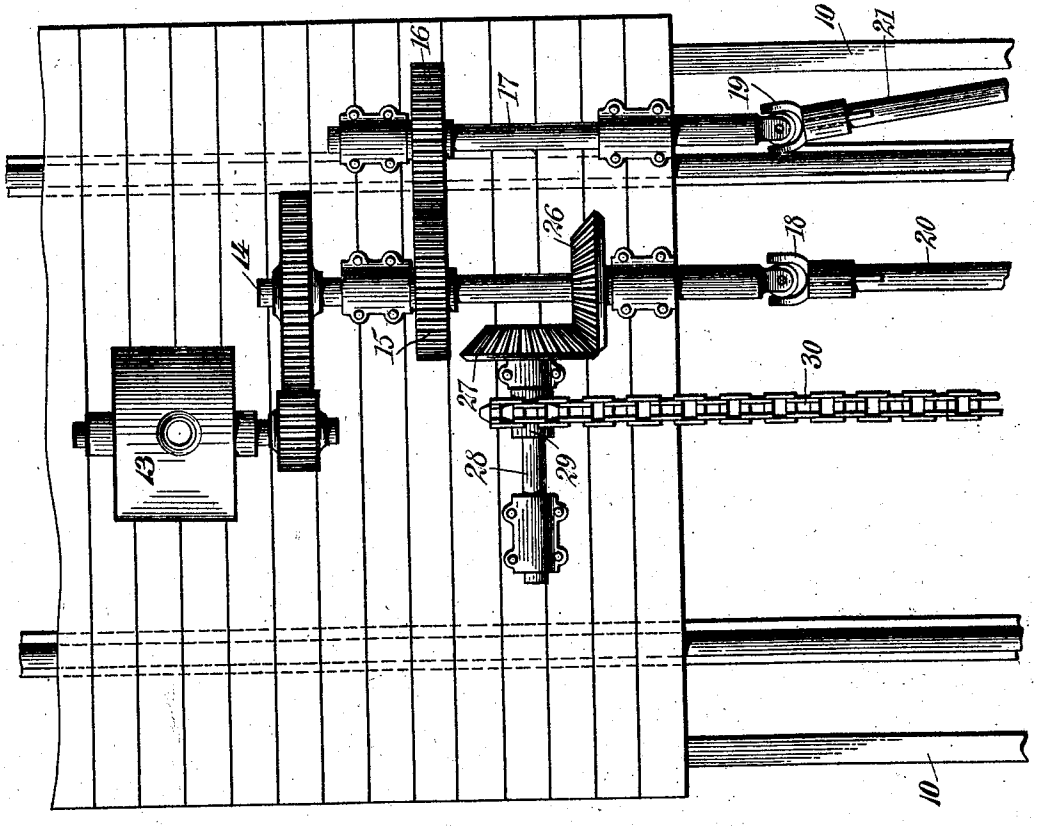


Fig. 3.

WITNESSES:

H. G. Dieterich

A. E. Fay.

INVENTOR

William Gilmore

BY

ATTORNEYS

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS. WASHINGTON D. C.

No. 823,855. PATENTED JUNE 19, 1906.

W. GILMORE.

UNIVERSAL EXCAVATING AND GRADING MACHINE.

APPLICATION FILED AUG. 26, 1905.

5 SHEETS—SHEET 4.

Fig. 8.

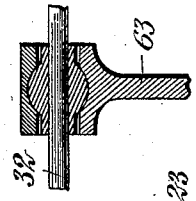


Fig. 7.

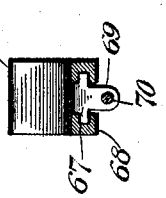
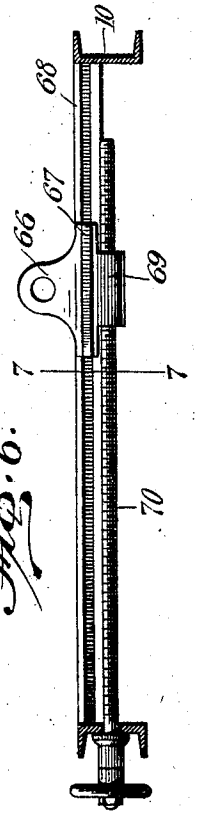


Fig. 4.

Fig. 6.



WITNESSES:

H. G. Dieterich

A. E. Fay.

INVENTOR

William Gilmore

BY

Munn & Co.

ATTORNEYS

No. 823,855. PATENTED JUNE 19, 1906.

W. GILMORE.

UNIVERSAL EXCAVATING AND GRADING MACHINE.

APPLICATION FILED AUG. 26, 1905.

5 SHEETS—SHEET 5.

Fig. 9.

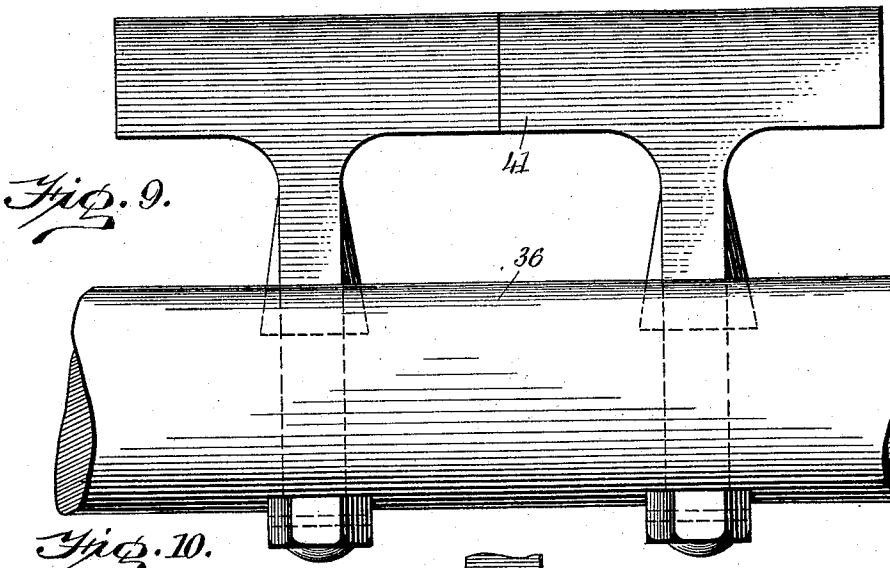


Fig. 10.

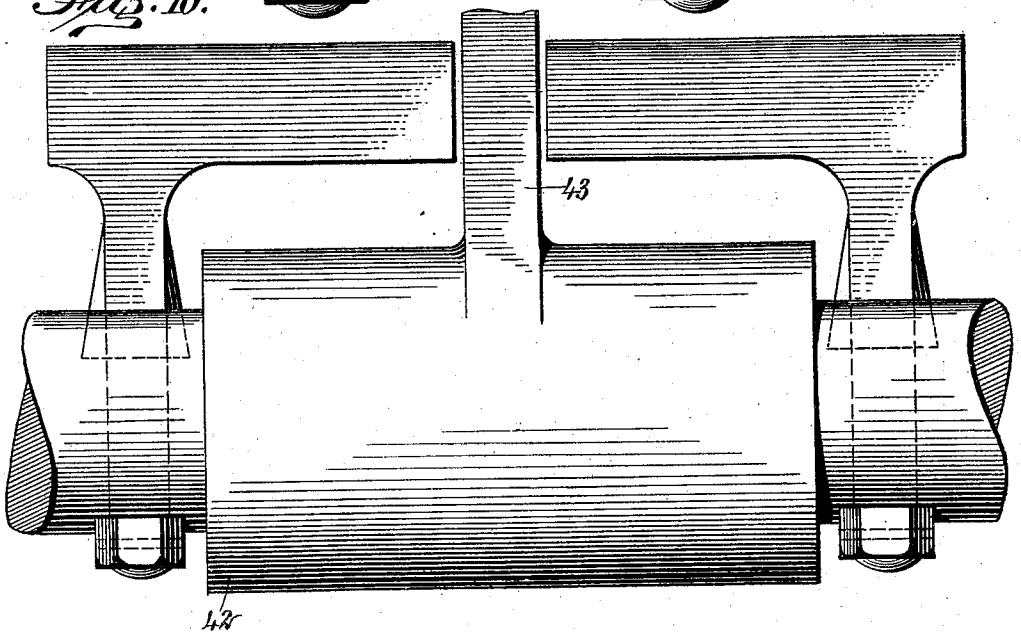
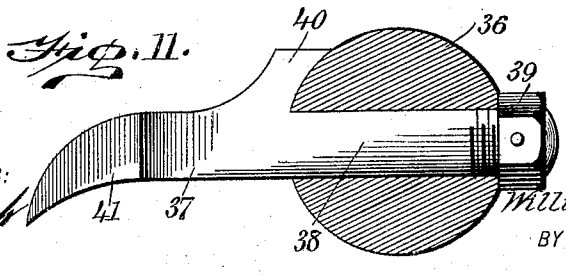


Fig. 11.



WITNESSES:

H. G. Dieterich

A. F. Fay

INVENTOR

William Gilmore

BY

Munn & Co.

ATTORNEYS.

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM GILMORE, OF MERIDIAN, MISSISSIPPI.

UNIVERSAL EXCAVATING AND GRADING MACHINE.

No. 823,855. Specification of Letters Patent. Patented June 19, 1906.

Application filed August 26, 1905. Serial No. 275,908.

To all whom it may concern:

Be it known that I, WILLIAM GILMORE, a citizen of the United States, and a resident of Meridian, in the county of Lauderdale and State of Mississippi, have invented a new and Improved Universal Excavating and Grading Machine, of which the following is a full, clear, and exact description.

My invention relates to an excavating and grading machine, the principal objects thereof being to provide for universal adjustment of the parts to permit working under various conditions, and especially to provide for excavating under a railroad-track without removing the track, so as to cut down grades without discontinuing the trains for any length of time and to do the work at a greatly-reduced cost on account of the rapidity of the machine in handling large amounts of earth.

Further objects are to provide for fitting the machine for new construction-work, either in making cuts or fills, by making very simple changes.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a machine, showing the principle of my invention. Fig. 2 is an end elevation of the same. Fig. 3 is a plan of a portion of a machine. Fig. 4 is a plan of the remainder of the machine. Fig. 5 is a sectional view of an adjusting device shown in Fig. 2. Fig. 6 is a sectional view of another adjusting device. Fig. 7 is a sectional view on the line 7 7 of Fig. 6. Fig. 8 is a sectional view of a detail. Fig. 9 is an elevation of a cutter-shaft, showing the form of the cutters. Fig. 10 is a similar view of the shaft at a different point; and Fig. 11 is a sectional view of the shaft, showing a cutter in elevation.

The device is shown as comprising a truck 10, mounted on wheels 11, which may be ordinary car-wheels or may be constructed in such a manner as to provide for propelling the device along a track. The truck is provided with a platform 12, upon which is mounted a motor 13 of any desired character, connected with a shaft 14. On this shaft is mounted a gear 15, which meshes with a second gear 16 on a shaft 17. Each of the shafts 14 and 17 is provided with a clutch and means for transmitting power to a point at an angle with the shaft. For this purpose I show universal joints 18 and 19, respectively, transmitting power through shafts 20 and 21 and universal joints 22 and 23 to shafts 24 and 25. The shaft 14 is also provided with a bevel-gear 26, transmitting power to a gear 27 on a shaft 28. This shaft carries a spur-wheel 29, which transmits power through a chain 30 to a sprocket-wheel 31 on a shaft 32, on the opposite ends of which are located sprocket-wheels 33, which are connected, by means of a chain 34, with sprocket-wheels 35 on a shaft 36. This shaft 36 carries a series of cutters or excavating implements 37.

As shown in Fig. 11, each cutter is provided with a shank 38, which passes through a perforation in the shaft and is secured thereto by a nut 39. Each cutter is also provided with a projection 40, which is broadened at the rear and extends part way around the shaft to afford a firm bearing-surface against the shaft for the cutter. The cutters are also provided with flanges 41, extending longitudinally of the shaft, so that there will be no space between the edges of the cutters. These cutters are placed around the shaft, each one slightly to the rear of the preceding one, so that altogether they form a circle one or more times around the shaft. This provides that the starting of the shaft will not cause any one set of cutters to take too large a cut before the others are introduced into the earth, thus providing a uniform cutting operation throughout the length of the shaft.

In Fig. 10 a hub 42, by which the shaft is supported, is shown, and the cutters on both sides of the hub extend from the right and left hand sides, respectively, toward a hanger 43, which supports the hub and provides against leaving a space at this point which will not be operated upon by the cutters. The shaft 36 is designed to extend under the track to be graded, and the whole device will travel along the track as the excavating operation proceeds.

For moving the excavated earth along the side of the cutters in order that it may be taken out of the way I have shown a conveyer 44, having plates 45 designed to move along and convey the earth to the side of the machine. This conveyer is in the form of an endless chain running on sprocket-wheels 46. These sprocket-wheels are arranged in pairs, as shown in Fig. 1, and one pair of them is mounted upon the shaft 25, the others being mounted upon three shafts 47 parallel with the shaft 25, these four shafts being arranged

substantially in the form of a rectangle, but the lower ones being slightly farther apart than the upper ones. When the material is moved to one side of the machine by the conveyer 44, it is desirable to provide means for conveying it away to some distance, and this is accomplished through the shaft 24, upon which is mounted a sprocket-wheel 48, operating, by means of a chain 49, a sprocket-wheel 50. This wheel is mounted on a frame 51, which is pivotally mounted by means of a shaft 52. The frame also supports a shaft 53, which carries a sprocket-wheel 54, connected, by means of a chain 55, with a second sprocket-wheel (not shown) on the shaft on which the wheel 50 is mounted. The shaft 53 operates an endless-chain conveyer 56, which also runs over the shaft 52. All these conveying devices are operated by the motor simultaneously, first, to cut the earth deposited at the rear; second, to convey the earth from this position to the side of the machine, and, third, to convey it to a distance from the machine upon the side.

I will now describe the means which I have illustrated for supporting the various conveying and excavating devices that have been referred to above.

The axles of the wheels 11 are provided with bearings 57, upon which are mounted frames 58. Each of these frames is provided with a nut 59, in which works a hand-screw 60. This screw is swiveled at its lower end to a slide 61, which operates up and down in the frame and carries a stud 62, which is rigidly connected with a frame 63. This frame extends upwardly and carries the shafts 25 and 47, as well as the shaft 32, in suitable bearings, and on the lower side the two frames 63 carry the lower shafts 36 and 47. These supporting-frames 63 constitute means for moving the cutter-shaft along below the tracks. On the side on which the conveyer 56 is located an extension 64 is mounted for supporting the shaft 52. It will be seen that the whole of the two frames 63, with the parts that they carry, can be raised and lowered by manipulating the screws 60 and also that this part of the device can be removed from the body of the machine.

In order to provide for locating the conveyer 56 at any desired angle, the shaft 24 is mounted in bearings 66, which are in turn mounted on a slide 67, working in ways 68 on the frame. This slide is provided with a nut 69 and a hand-screw 70 for operating it. The manipulation of this screw provides for moving the shaft 24, which is permitted by the universal joints and allows the adjustment of the angle of the conveyer. A cable or rope 71 is connected with the shaft 53 for holding the conveyer in the desired position, and this can readily be adjusted.

I have shown a drag conveyer or platform 72, over which the conveyer 44 moves. This platform has a back 73 bent upwardly, preferably at right angles, and forms a trough for receiving the earth excavated and holding it in a position to be acted on by the conveyer 44.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an excavating-machine, the combination of an earth-cutting device, means for moving the earth longitudinally with respect thereto, and a conveyer for receiving the earth from said means.

2. In an excavating-machine, the combination of a rotary excavating device having a series of cutters, a link conveyer located adjacent thereto and adapted to move material along the excavating device to one side of the machine, and an endless-chain conveyer for receiving material from the first-mentioned conveyer and transferring it away from the machine.

3. In an excavating device, the combination of a rotary shaft, a series of cutters arranged each at an angle to the others about said shaft, and means for conveying material along the shaft at the rear thereof.

4. An excavating-machine, having a shaft, and a series of cutters mounted on the shaft, each cutter being arranged at an angle from the cutter upon each side thereof.

5. An excavating-machine, comprising a shaft having a series of perforations, each perforation being located at an angle with respect to the next one, and a series of cutters each having a shank adapted to pass through one of said perforations, said cutters being provided with flanges whereby the cutting-blades present a substantially continuous surface.

6. An excavating-machine, comprising a shaft having a series of perforations, each perforation being located at an angle with respect to the next one, and a series of cutters each having a shank adapted to pass through one of said perforations, said cutters being provided with flanges whereby the cutting-blades present a substantially continuous surface, and each cutter being provided with a projection extending to the rear and adapted to engage the surface of the shaft.

7. An excavating-machine, comprising a shaft having a series of perforations, each perforation being located at an angle with respect to the next one, and a series of cutters each having a shank adapted to pass through one of said perforations, said cutters being provided with flanges whereby the cutting-blades present a substantially continuous surface; in combination with a frame for supporting said shaft, and means for mounting said frame below a car-track, whereby the car-track may be graded without taking up the track.

8. An excavating device, comprising a

shaft, a series of cutters thereon, and means for supporting said shaft and moving it along below a track, whereby the earth below the track can be excavated without removing the track.

9. An excavating-machine, comprising a truck, a frame adjustably mounted thereon, a cutting device supported by said frame below the track upon which the truck runs, and means mounted adjacent to the cutting device for moving material therefrom to one side of the track.

10. An excavating-machine, comprising a truck, a frame connected therewith, said frame having a nut, a screw mounted in said nut, a second frame to which the screw is swiveled, and an excavating device mounted on said second frame.

11. In an excavating-machine, the combination of a truck, a motor thereon, a pair of shafts connected with said motor, a second pair of shafts connected with the first-mentioned shafts, universal joints between said two sets of shafts, an excavating device connected with one of said last-mentioned shafts, and a conveyer connected with the other.

12. In an excavating-machine, the combination of a motor, a shaft therefor, a second shaft operatively connected with the first shaft, a universal joint mounted upon each of said shafts, an excavating device connected with one shaft, a conveyer connected with the other shaft for removing material from the excavating device, and a second conveyer connected with the first-mentioned shaft.

13. In an excavating-machine, the combination of a motor, a shaft therefor, a second shaft operatively connected with the first shaft, a universal joint mounted upon each of said shafts, an excavating device connected with one shaft, a conveyer connected with the other shaft for removing material from the excavating device, and a second conveyer connected with the first-mentioned shaft, and a trough located adjacent to the excavating device for receiving material from the latter and delivering it to the first conveyer.

14. An excavating-machine comprising an excavating device, a platform for receiving material therefrom and a conveyer operable along said platform for removing material therefrom.

15. An excavating-machine comprising a rotary excavating device, a platform extending parallel with the excavating device and adjacent thereto and an endless conveyer mounted over said platform and adapted to move along the platform.

16. In an excavator, the combination of an adjustable frame, an excavating device mounted thereon, a conveyer on the frame for moving material to one side of the frame, a second conveyer pivotally mounted upon said frame, means for operating the second conveyer, and means for adjusting it to any desired angle with respect to the frame.

17. In an excavator, the combination of a truck, a platform thereon, a motor on the platform, a shaft operated by the motor, a second shaft operated by the first shaft, an excavating device operated by the first shaft, and two conveyers, one operated by each of said shafts, a pivoted frame upon which one of said conveyers is mounted, a sprocket-chain for operating said conveyer, a sprocket-wheel with which the chain engages, and means for adjusting said sprocket-wheel toward and from the conveyer which it operates.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM GILMORE.

Witnesses:
J. M. HARWELL,
E. B. WILLIAMS.