

No. 759,954.

PATENTED MAY 17, 1904.

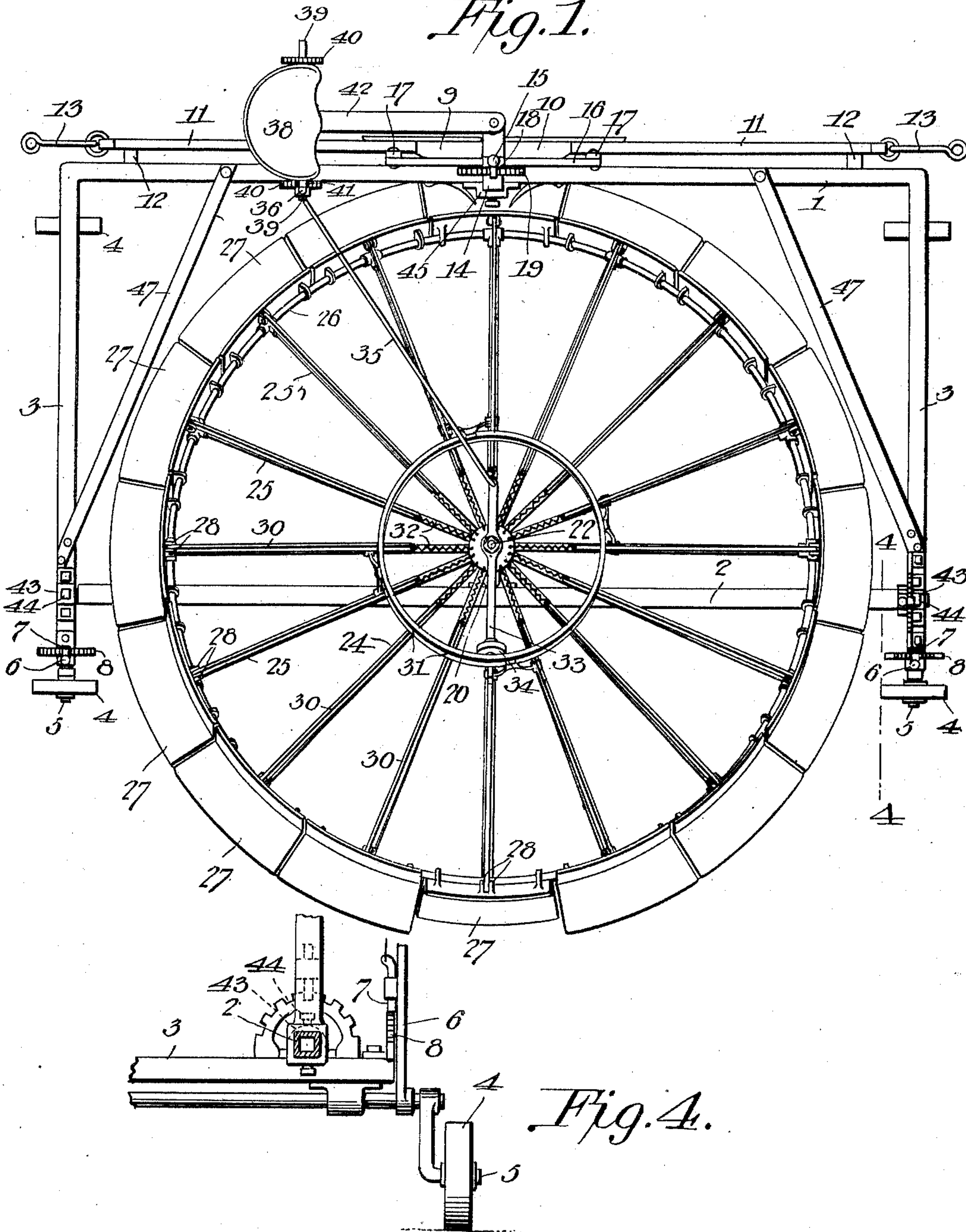
J. W. BAKER.  
GRADING AND DITCHING MACHINE.

APPLICATION FILED JAN. 15, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 4.*

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Witnesses

*E. F. Stewart*  
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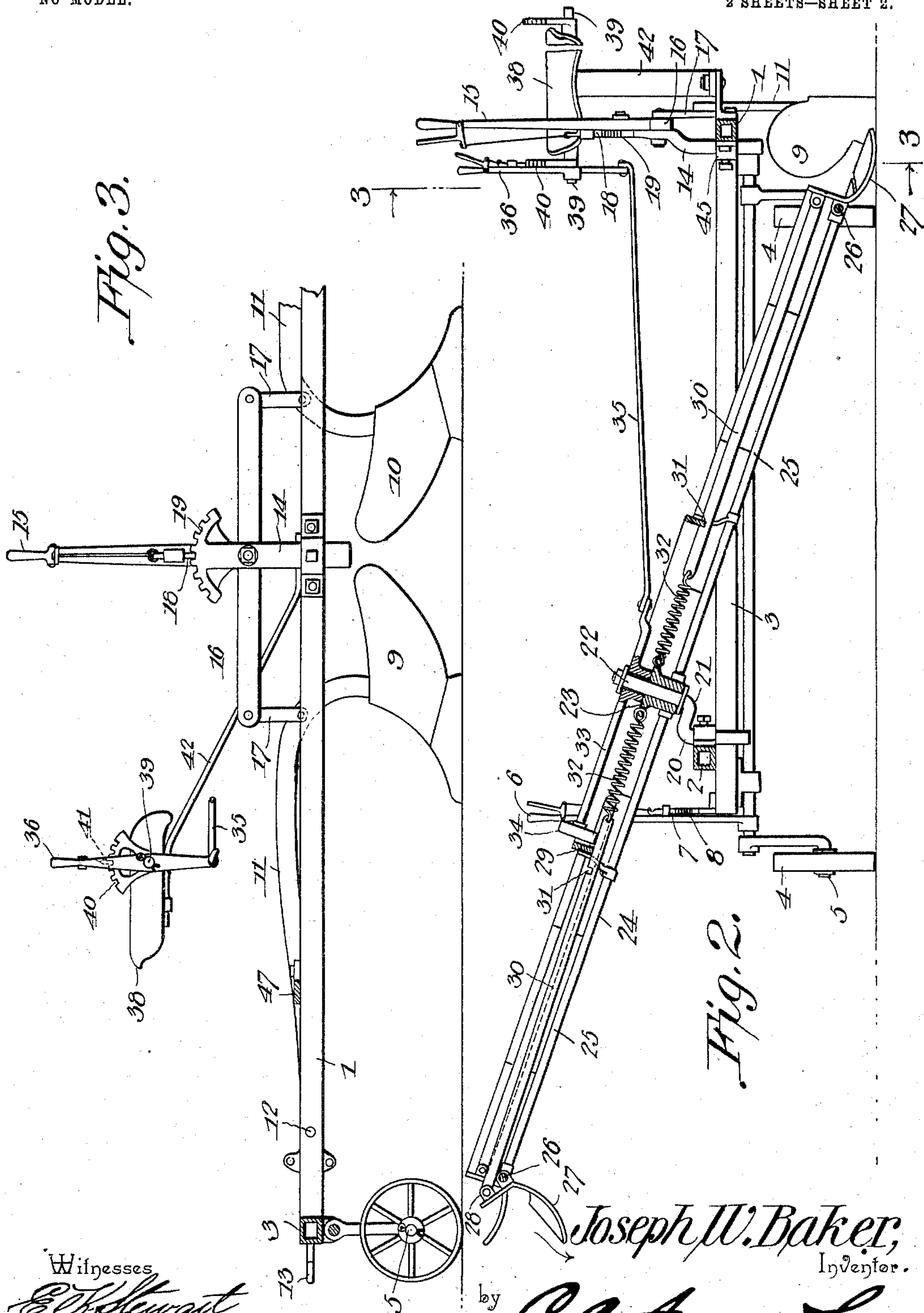
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# UNITED STATES PATENT OFFICE.

JOSEPH W. BAKER, OF EL PASO, TEXAS.

## GRADING AND DITCHING MACHINE.

**SPECIFICATION** forming part of Letters Patent No. 759,954, dated May 17, 1904.

Application filed January 15, 1904. Serial No. 189,151. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH W. BAKER, a citizen of the United States, residing at El Paso, in the county of El Paso and State of Texas, have invented a new and useful Grading and Ditching Machine, of which the following is a specification.

This invention relates to grading and ditching machines such as are used for making, grading, and repairing roads, for digging ditches, building levees, and for all similar purposes which require dirt to be excavated, elevated, and delivered at a distance from the point where the excavation is made.

The invention has for its object to provide a machine of this class which shall be simple in construction and efficient in operation; and with these ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings is shown a simple and preferred form of embodiment of my invention, it being understood that changes may be made as to the size, proportion, and exact manner of assemblage of parts within the scope of my invention and without departing from the spirit or sacrificing the utility of the same.

In said drawings, Figure 1 is a plan view of a machine constructed in accordance with my invention. Fig. 2 is a transverse sectional view enlarged. Fig. 3 is a sectional view taken on the line 3 3 in Fig. 2, the carrier-wheel being omitted. Fig. 4 is a sectional detail view enlarged, taken on the line 4 4 in Fig. 1.

Corresponding parts in the several figures are indicated by similar numerals of reference.

In carrying out my invention I provide a rectangular frame composed of side pieces 1 and end pieces 3 3. The frame is supported by means of wheels 4, mounted upon crank-axles 5 at the front and rear ends of the frame, said crank-axles being adjustable by means of levers 6, having lock-dogs adapted to engage suitably-disposed toothed quadrants 8 for the purpose of retaining the axles, which latter are mounted to rock in suitable bearings attached to the frame in any position to

which they may be adjusted. By this construction it will be seen that the entire frame may be raised or lowered, as may be desired, and also that either end of said frame may be vertically adjusted independently of the other end.

Adjacent to one side of the frame in proximity to the side beam 1 are disposed two plows 9 and 10, one of said plows being a right-hand plow and the other a left-hand plow. The beams 11 of said plows have pivotal connection at 12 with the side 1 of the frame, and said beams are provided at their front ends with ordinary means, as 13, for the attachment of draft.

Rising from the side piece 1 is an upright 14, to which is pivoted a hand-lever 15, having at its lower end a T-head 16, the oppositely-extending arms of which are connected, by means of links 17, with the rear ends of the plow-beams 11. It will be seen that by moving the lever 15 in one direction one of the plows will be depressed into operative or earth-engaging position, while by reversing the position of the lever the relative position of the plows will be reversed. The lever 15 may be locked at any desired point of adjustment by means of an ordinary lock-dog 18, engaging a toothed segment 19, supported by the upright 14.

The opposite side beam 2 of the frame has an upright 20, provided with an inwardly-extending elbow 21, at the inner end of which is an inclined spindle 22, supporting the hub 23 of a large wheel 24, which constitutes the carrier of the machine. This wheel comprises besides the hub 23 a plurality of radiating spokes 25, connecting said hub with the rim 26, which hingedly supports a plurality of buckets 27, having inwardly-extending lugs 28, each bucket being provided with a pair of said lugs. The spokes of the wheel support a ring or annulus 29. Pivotal connection with the lugs 28 of each of the buckets 27 is a latch-bar 30, provided near its inner end with a notch 31, adapted to engage the under edge of the ring 29, which latter thus serves to lock the latch-bar in operative position. The inner ends of the latch-bars are connected with the hub of the wheel by



means of coiled springs 32, whereby they are automatically drawn into operative or locked position, as will be readily understood.

Suitably swiveled on the spindle 22 above the hub of the wheel 24 is an arm or lever 33, carrying at one end a wheel 34, constituting a trip device for the latch-bars, in the path of which the said wheel is disposed. The opposite end of the arm or lever 33 is connected by a rod 35 with an operating-lever 36. Said operating-lever is connected detachably with one side of the driver's seat 38 and may be shifted from one side of said seat to the other side, the seat being provided on each side with a fulcrum pin or stud 39 for said lever and with a toothed segment 40 to be engaged by a lock-dog 41, with which said lever is provided. The seat 38 is carried by a pivoted supporting-spring 42, whereby it may be reversed, so as to face either end of the frame of the machine. When the seat is thus reversed, it obviously becomes necessary to shift the operating-lever 36 from one side of the seat to the other, the connecting-rod 35 being unhooked from the lever while such change is being effected. By means of this lever and connecting-rod the arm or lever 33, carrying the trip-wheel 34, may be adjusted to various positions in order that the latch-bar may pass into engagement with the trip mechanism at any desired predetermined point.

The frame of the machine is for strengthening purposes provided with suitably-disposed braces 47, and I desire it to be understood that in order to properly support the weight of the carrier-wheel suitable guides and antifriction-bearings may be used wherever they may be profitably employed. Such devices, however, are well known in the art and have not been particularly illustrated in the drawings.

It will be observed that in the operation of this device the draft may be attached to either end of the machine, which may be thus propelled in either direction. The lower portion of the periphery of the carrying-wheel 24 is to be adjusted in contact with the ground, and this may be effected by mounting the ends of the frame-bar 2 pivotally in boxes 43 upon the end pieces 3 of the frame. The weight of the wheel upon the elbow 21 will cause it to sag automatically into the proper earth-engaging position, and it may, if desired, be secured in such earth-engaging position by means of set-screws 44, engaging the boxes 43, or by any other suitable and convenient means. It is also obvious that the entire frame of the machine, by means of the crank-axles carrying the supporting-wheels, may be raised or lowered within the limits of the length of the cranks. To provide for such adjustment, the upright 14, carrying the plow-setting lever 15, is also preferably mounted adjustably in a socket 45 upon the side piece 1 of the frame. When the machine in opera-

tion passes over the ground, the plows having been previously set to the proper position, the dirt turned by the operative plow will be deposited upon the buckets of the carrying-wheel, which latter by contact with the soil will be rotated as the machine progresses, thus elevating the soil and simultaneously carrying it to the opposite side of the frame. The latch-bars of the respective buckets will thus be engaged by the trip-wheel, which has been previously adjusted by the means described, being thereby depressed until the notches 31 become disengaged from the annulus 29, when the weight of the load upon the buckets will tilt the latter against the tension of the springs 32, thus discharging the load. Being relieved of the load, the weight of the buckets will be overcome by the tension of the springs 32, whereby the latch-bars are redrawn into locked position, and the buckets will thus be ready to receive another load.

It is obvious from the foregoing that the machine by simply transferring the draft from one end of the frame to the other and reversing the position of the plows and seat may be operated with equal efficiency in opposite directions. The general construction is such that the machine is enabled to work very close to fences, hedges, and similar obstructions, and the dirt excavated may be deposited at a distance from the point where it is excavated equal to the diameter of the wheel, which in practice may be made of any desired size. The frame may be adjusted and the wheel may be tilted so as to elevate the dirt to any desired height within the capacity of the machine, which will thus be found extremely useful not only for road building and grading purposes, but equally for ditching and for building levees and the like.

Having thus described my invention, I claim—

1. In a machine of the class described, an earth-engaging inclined carrier-wheel, and right and left hand plows arranged adjacent to the lower edge of said wheel.

2. In a machine of the class described, an inclined earth-engaging carrier-wheel, a frame supporting the same, and a pair of plows, one right-hand and one left-hand, supported by said frame adjacent to the lower earth-engaging edge of said wheel.

3. In a machine of the class described, an inclined earth-engaging carrier-wheel, a frame supporting the same, a pair of oppositely-faced plows disposed adjacent to the lower earth-engaging edge of said wheel, and means for moving said plows vertically in opposite directions.

4. In a machine of the class described, an inclined earth-engaging carrier-wheel, a supporting-frame for the same, supporting-wheels for said frame, means for vertically adjusting the latter with relation to the said supporting-wheels, a plow arranged adjacent to



the lower earth-engaging edge of the carrier-wheel, and means for independent vertical adjustment of said plow.

5. In a machine of the class described, an inclined carrier-wheel, a supporting-frame for the same, supporting-wheels for said frame, means for adjusting the latter vertically with relation to the said wheels, oppositely-faced plows, the beams of which have pivotal connection with one side of the frame adjacent to the lower edge of the carrier-wheel, an upright vertically adjustable with relation to the frame, and means connected with said upright for effecting vertical adjustment in opposite directions, of said plows.

6. In a machine of the class described, a wheel-supported frame, oppositely-faced plows connected with one side of said frame, an upright rising from the opposite side of said frame and having an inwardly-extending elbow, and an inclined earth-engaging wheel journaled to said elbow.

7. In a machine of the class described, a wheeled supporting-frame, oppositely-faced plows connected with one side of said frame, an inclined carrier-wheel, and means for supporting the latter adjustably in an inclined position.

8. In a machine of the class described, a wheeled supporting-frame, an inclined carrier-wheel having a plurality of buckets, excavating means for throwing the excavated material upon said buckets at the lower edge of the wheel, and means for tilting the said buckets at a predetermined point.

9. In a machine of the class described, a supporting-frame, a reversely-revoluble inclined carrier-wheel, oppositely-pointed excavating means disposed adjacent to the lower edge of the carrier-wheel, and means for adjusting said excavating means vertically in opposite directions.

10. In a machine of the class described, a supporting-frame, a reversely-revoluble carrier-wheel having a plurality of tilting buckets, oppositely-pointed excavating means, means for adjusting said excavating means vertically in opposite directions, an adjustable rotary tripping device, and latch means co-operating with said tripping device to tilt the buckets when the carrier-wheel rotates in either direction.

11. In a machine of the class described, a supporting-frame including a side piece journaled on the end bars and constituting a rock-shaft, and an inclined carrier-wheel mounted upon said rock-shaft.

12. In a machine of the class described, a supporting-frame including a rock-shaft, supporting-wheels for said frame, means for effecting vertical adjustment of said frame with relation to the said supporting-wheels, and a carrier-wheel mounted upon said rock-shaft.

13. In a machine of the class described, a

wheeled supporting-frame including a rock-shaft, an upright rising from said shaft and having an elbow and a carrier-wheel journaled upon said elbow.

14. In a machine of the class described, a carrier-wheel, a plurality of buckets connected hingedly with the rim of said wheel, latch-bars connected hingedly with said buckets and provided with notches near their inner ends, and an annulus concentric with the rim of the wheel and engaging the notches in the latch-bars.

15. In a machine of the class described, a suitably-supported carrier-wheel, a plurality of buckets hingedly connected with the rim of said wheel, latch-bars hingedly connected with said buckets and provided with notches near their inner ends, an annulus concentric with the rim of the wheel and adapted to engage the notches in the latch-bars, and springs connecting the inner ends of the latter with the hub of the wheel.

16. In a machine of the class described, a suitably-supported carrier-wheel, a plurality of buckets hingedly connected with the rim of said wheel, latch-bars hingedly connected with said buckets and having notches near their lower ends, an annulus concentric with the rim of the wheel and engaging the notches in said latch-bars, spring means for forcing the latch-bars in an inward direction, and a tripping device to disengage the notched latch-bars from the annulus.

17. In a machine of the class described, a suitably-supported carrier-wheel, buckets hingedly connected with the rim of said wheel, an annulus concentric with the rim of the wheel, latch-bars adapted to engage said annulus, spring means for forcing said latch-bars in an inward direction, and adjustable trip means to engage and unlock said latch-bars at a predetermined point.

18. In a machine of the class described, a suitably-supported carrier-wheel, buckets connected hingedly with the rim of said wheel, latch-bars hingedly connected with said buckets, an annulus concentric with the rim of the wheel and engaging said latch-bars, spring means for forcing the latter into engagement with the annulus, an arm journaled upon the axis of the carrier-wheel, a rotary tripping element carried by said arm to disengage the latch-bars from the annulus at a predetermined point, and adjusting means for the trip-carrying arm.

19. In a machine of the class described, a wheeled supporting-frame, an inclined, reversely-revoluble carrier-wheel, excavating elements, disposed adjacent to the lower edge of said wheel, means for effecting opposite vertical adjustment of said excavating elements, a seat, and a pivoted, reversible seat-supporting standard.

20. In a machine of the class described, a wheeled supporting-frame, an inclined car-



rier-wheel having a plurality of tilting buckets, latch mechanism for retaining said buckets in operative position, a pivoted trip-carrying arm, excavating elements disposed adjacent to the lower edge of the carrier-wheel,  
5 means for adjusting said excavating elements vertically in opposite directions, a seat provided on opposite sides with fulcrum-pins, a pivoted reversible support for said seat, an  
10 operating-lever fulcrumed upon the latter,

and connecting means between said operating-rod and the trip-carrying arm.

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

JOSEPH W. BAKER.

Witnesses:

U. S. GOEN,

J. F. MITCHELL.