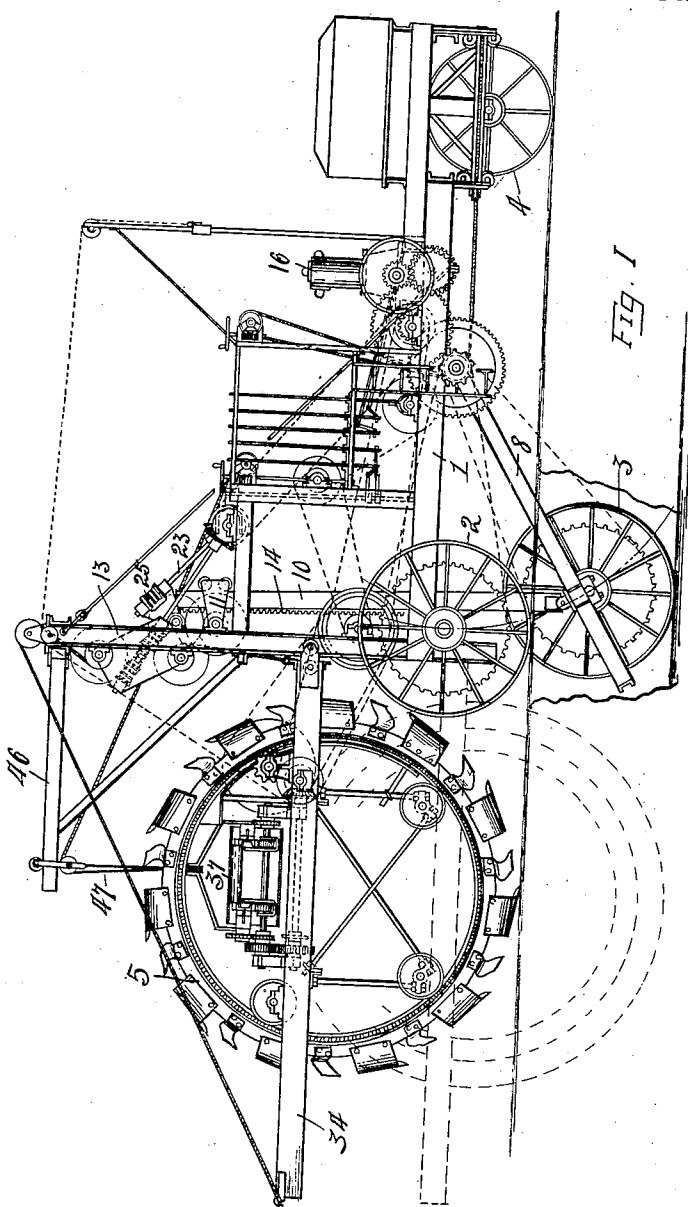


1,056,105

L. A. KRUPP.
EXCAVATING MACHINE.
APPLICATION FILED FEB. 5, 1912.

Patented Mar. 18, 1913.

5 SHEETS—SHEET 1.



WITNESSES:

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BY *Corn & Corn*

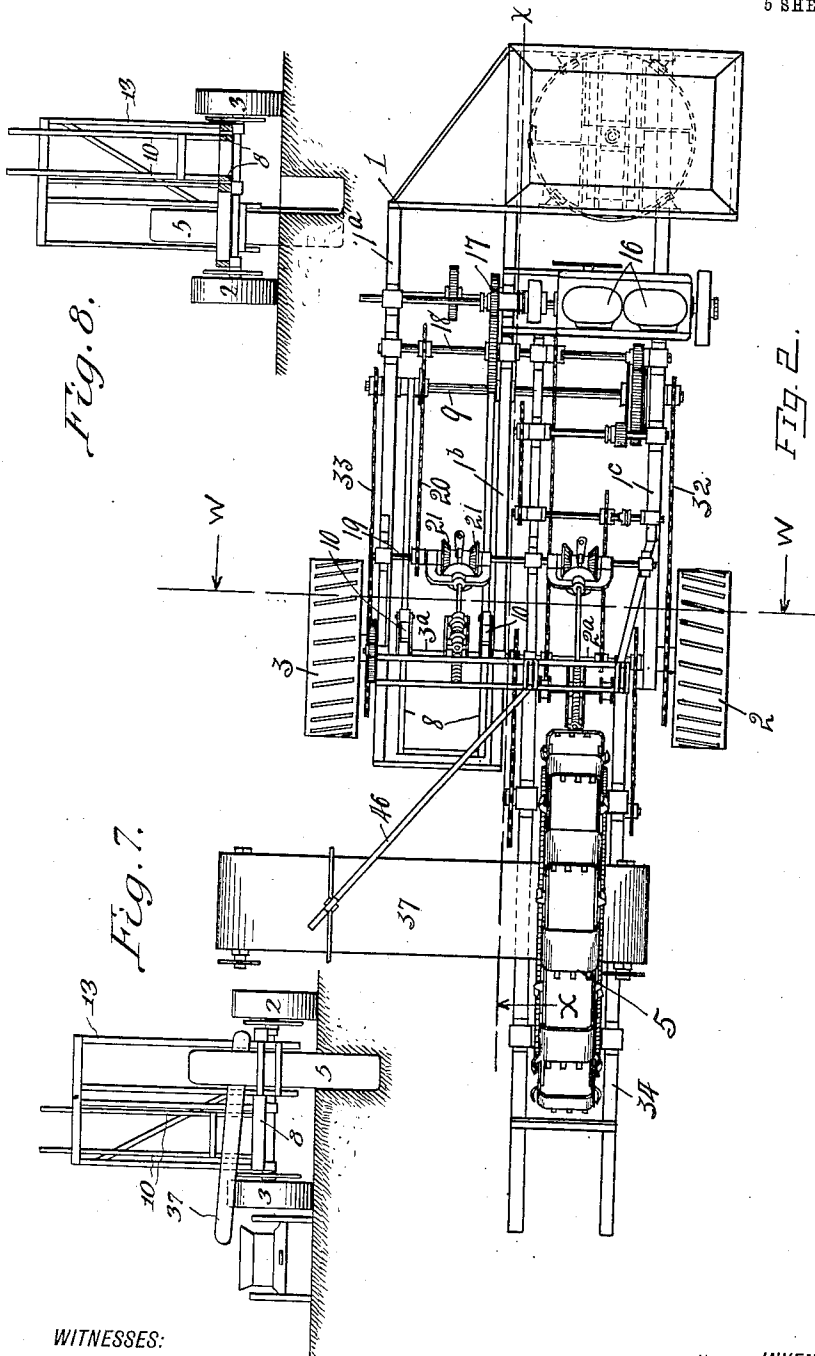
ATTORNEYS

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5 SHEETS—SHEET 2.



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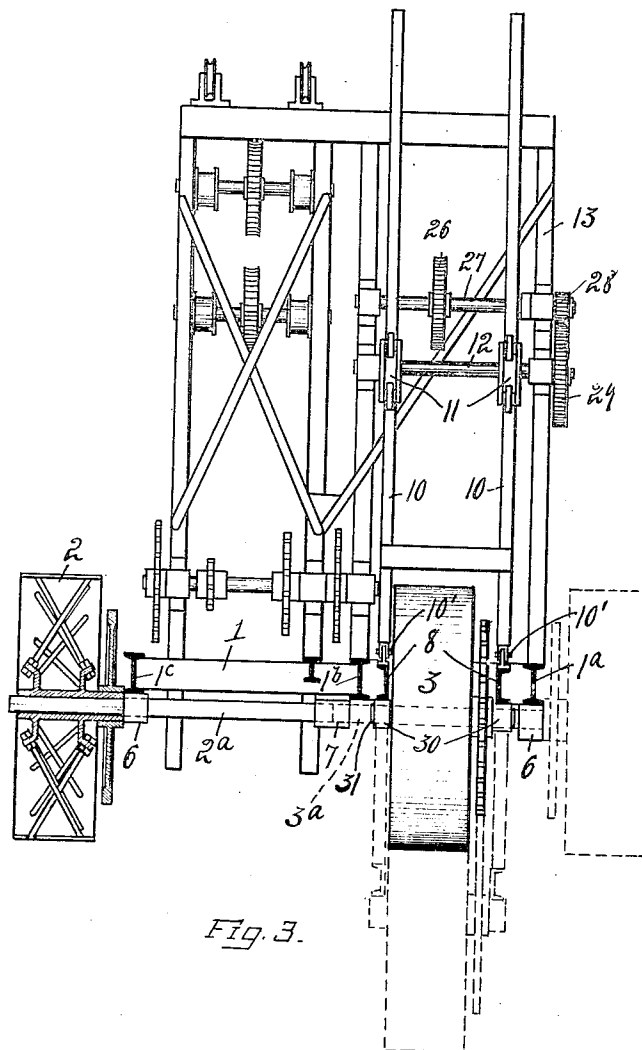
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5 SHEETS—SHEET 3.



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5 SHEETS—SHEET 4.

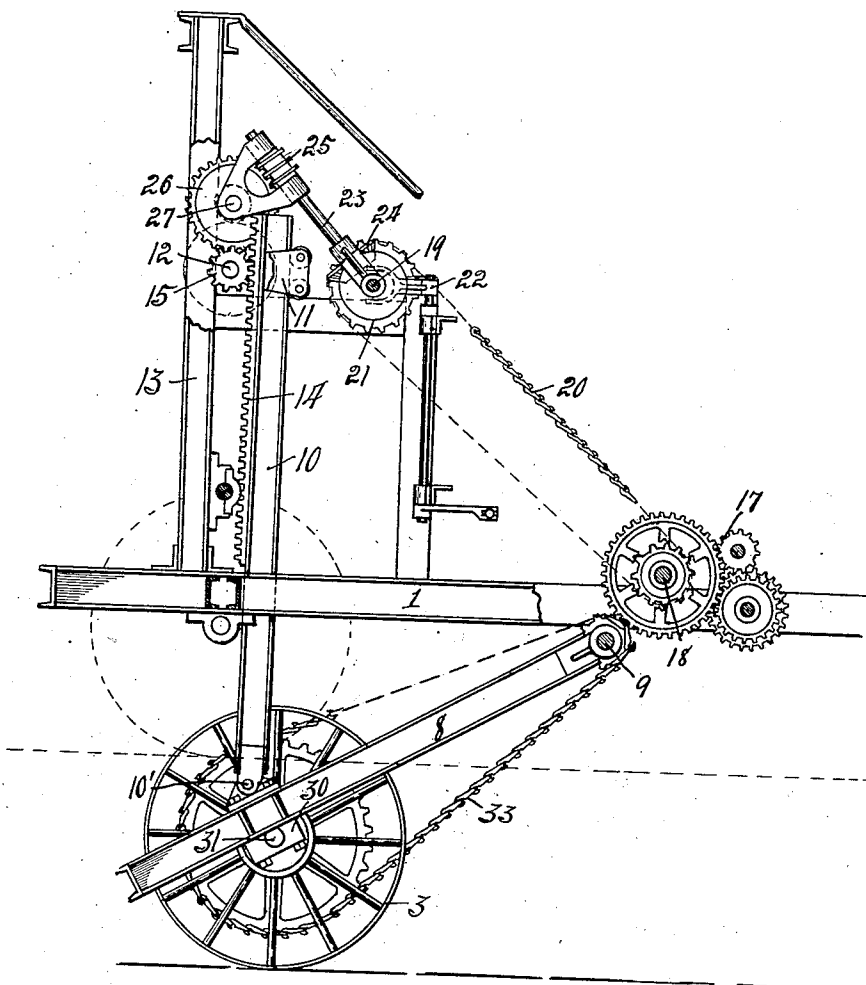


Fig. 4.

WITNESSES

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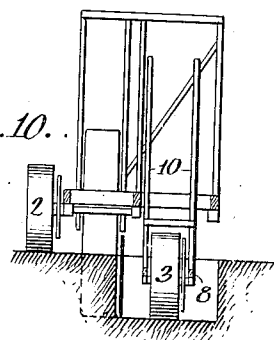
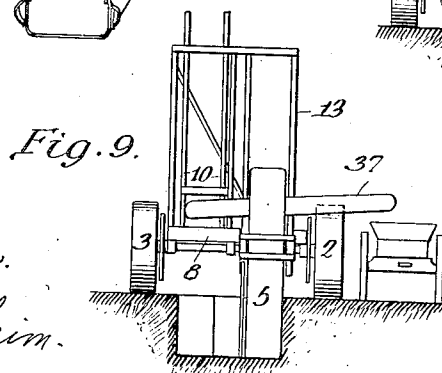
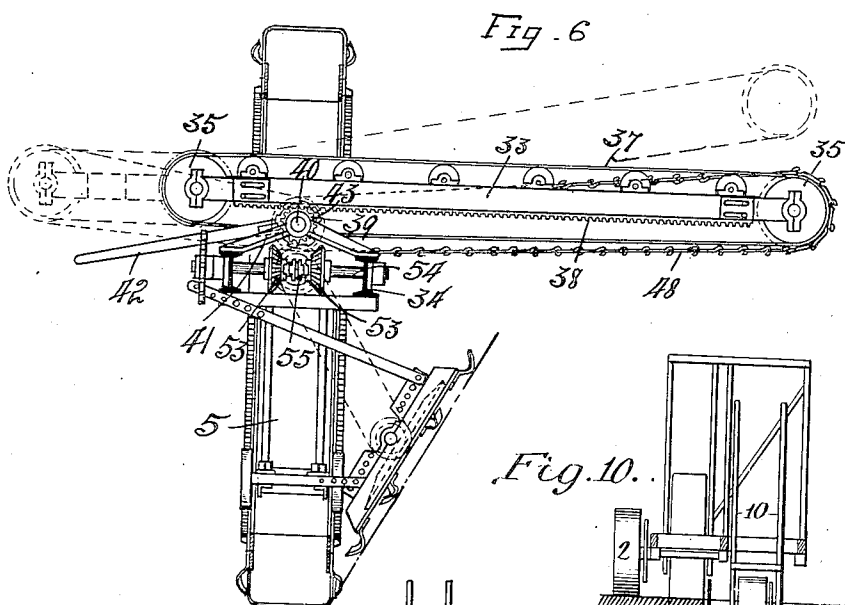
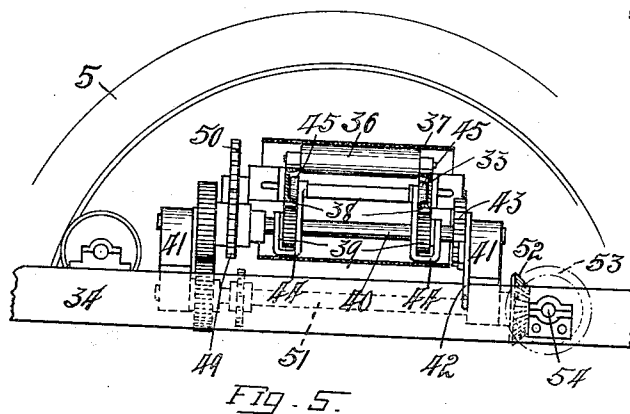
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

LEO A. KRUPP, OF FINDLAY, OHIO.

EXCAVATING-MACHINE.

1,056,105.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed February 5, 1912. Serial No. 675,686.

To all whom it may concern:

Be it known that I, LEO A. KRUPP, a citizen of the United States, and a resident of Findlay, in the county of Hancock and State of Ohio, have invented a certain new and useful Excavating-Machine; and I do hereby 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 figures of reference marked thereon, which form a part of this specification.

My invention relates particularly to trench excavating, open ditching and scalping machines, but is not restricted to such use as it may be used in any connection for which it may be adapted or appropriate.

The object of my invention is to provide an ordinary excavating machine of the rotary cutting-wheel type with simple and efficient means for easily and quickly adjusting at least one of the tractor or frame supporting wheels thereof to enable both of opposing ones of such wheels to travel on opposite banks of a ditch or trench being cut, or in substantially the same plane on opposite sides of the path of a cut, or to enable such wheels to be relatively adjusted in vertical planes whereby one may travel on the bottom of the trench or cut and the other on a bank thereof, thus adapting this type of machines for the digging of wide trenches, street scalping work, or the like.

A further object of my invention is the provision in combination with a machine of this class, of a conveyer mechanism for the diggings, which is adjustable to facilitate a right or left delivery of the diggings as the nature or condition of the work may require.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a side elevation of an excavating machine embodying my invention, with the cutting wheel in elevated position and one tractor wheel lowered into a trench being cut by the machine. Fig. 2 is a top plan view of the machine with the tractor wheels in alining position for narrow trench work. Fig. 3 is a cross-section of the machine on the line *w, w* in Fig. 2 with one

wheel in central section and the other wheel mounted within the lowering frame. Fig. 4 is an enlarged sectional detail on the line *x, x* in Fig. 2 showing the features embodying my invention. Fig. 5 is an enlarged side elevation of a portion of the cutting-wheel carrying frame, with the conveyer mechanism for the diggings in cross-section. Fig. 6 is an enlarged cross-section of the cutting-wheel and its carrying frame, with the conveyer mechanism in elevation thereon. Fig. 7 is a rear end view of the machine going down for first cut in street scalping work. Fig. 8 represents machine coming back and making second cut. Fig. 9 shows machine going down on third cut, and Fig. 10 shows machine coming back on fourth cut with adjustable wheel lowered to ride on bottom of cut.

Referring to the drawings, 1 designates the wheeled frame of any suitable form of ditching or excavating machine, which is supported in the present instance by the two rear tractor wheels 2 and 3 and by the forward steering wheel 4, and has the customary cutting-wheel 5 trailing from one side portion thereof and mounted for the usual adjustment, as well understood in the art.

When the machine is cutting or working down a narrow trench which is of less width than the maximum gage of the tractor wheels 2, 3, such wheels are mounted on the outer ends of a sectional axle which comprises the sections 2^a and 3^a for said wheels, respectively. The axle sections 2^a and 3^a are shown, in the present instance, as being mounted in suitable outer bearings 6 and have their inner ends mounted within a common center bearing 7, the shaft section 3^a being mounted within its bearings in a manner to facilitate its easy removal therefrom.

The truck frame 1 is shown, in the present instance, as comprising three major longitudinally extending spaced beam members 1^a, 1^b, and 1^c, the first two of which cooperate to form an open space within the frame which is disposed at the opposite side of the frame to that from which the cutting-wheel 5 trails, and within which space a wheel carrying frame 8 is mounted for vertical swinging movements, as best shown in Figs. 2 and 3. The frame 8 pivotally trails from a shaft 9 which is mounted in the frame members transversely thereof. Hoisting bars 10, 10 are pivotally attached at their lower ends

to the opposite sides of the frame 8 adjacent to the rear ends thereof, as at 10', and work upward through suitable swinging guides 11, which are carried by a shaft 12 that is mounted is an upright frame or standard 13 transversely of the machine. The guides 11 serve to swingingly retain rack-bars 14 on said hoisting bars in mesh with respective hoisting pinions 15 on the shaft 12, as best shown in Figs. 1, 3 and 4. The hoisting shaft 12 is connected through any suitable gearing with the driving motor 16 on the truck frame, as through the train of gears 17, one of which may be shiftable to engage or release the other gears of the set, such gears communicating rotation from the engine shaft to the shaft 18, which has chain and sprocket connection with a shaft 19, as indicated at 20. The shaft 19 carries two loose bevel gears 21, 21, between which a clutch member slides upon the shaft in feathered engagement therewith to drive either bevel gear or to permit both to stand at rest as desired. This clutch is controlled by a shift lever 22, which is operated in any suitable manner. Rotation is communicated in either direction from the gears 21 to the shaft 12 through the medium of a shaft 23 which carries a bevel gear 24 in mesh with both gears 21, and also carries a worm 25 in mesh with a worm-wheel 26, which is mounted on a shaft 27 with a small pinion 28, which pinion is in mesh with and drives a larger gear 29 on the shaft 12.

The swinging wheel-carrying frame 8 has bearings 30 for removably carrying a short axle section 31 upon which the wheel 3 may be mounted between the sides of the frame 8 when such wheel has been removed from the axle section 3^a. The bearings 30 preferably have their axle receiving openings in position to aline with the axle section 2^a when swung into register therewith so that the axle section 3^a may be projected through said bearings as well as the machine frame bearings 6 and 7 when such axle section is being employed, thus holding the swinging frame stationary in elevated inoperative position when not in use. It will, of course, be understood that the axle section 3^a is removed from its bearings when a tractor wheel 3 is removed therefrom and mounted upon the axle section 31 carried by the swinging frame, thus permitting the swinging frame to have free unobstructed swinging movements within the truck frame 1, as is apparent.

The shaft 9 from which the swinging frame 8 trails, serves as the driving shaft for the tractor wheels 2 and 3 and has one end in driving connection with the wheel 2 through a chain 32 and cooperating sprocket wheels, and its other end in driving connection with the wheel 3 through a chain 33 and cooperating sprocket wheels, as best

shown in Fig. 2. When the tractor wheel 3 is mounted within the swinging frame 8 the driving connection between such wheel and the shaft 9 is the same except that the chain 33 engages a sprocket wheel on said shaft which is disposed between the arms of said frame. The shaft 9 may be geared in any suitable manner to the motor 16 or other source of power as well understood in the art.

The conveyer mechanism for the diggings, which is best shown in Figs. 5 and 6, comprises a frame 33 of any desired length, which is carried within the cutting wheel 5 upon the top of the frame or boom 34, carrying such wheel, and has rolls 35 at its ends, which cooperate with idler-rolls 36 in guiding the course of an endless conveyer apron 37. Each side of the frame 33 has a rack-bar 38 on its under side, which rests upon a pinion 39 carried by a shaft 40, journaled longitudinally of the frame 34 in bearings 41 thereon, the conveyer being adjustable transversely of the frame 34, to project from one side or the other thereof, by a turning of said shaft and pinions. This turning is effected by the cooperating action of a lever 42 and a ratchet-wheel 43. The racks 38 are retained in mesh with the pinions 39 by members 44, which attach to the shaft 40 and carry rolls 45 for traveling in the channels of the conveyer frame sides (see Fig. 5). The free or outer end of the conveyer is suspended in proper elevation from a swinging boom 46 through the medium of an adjustable cable 47, as shown in Fig. 1. The conveyer apron is driven by means of a sprocket chain 48, which connects a drive sprocket 49 with a sprocket 50 carried without the frame 33 by the shaft of either roll 35. The sprocket 49 is suitably geared to a shaft 51 mounted lengthwise of the frame 34 and carrying a miter gear 52 in mesh with two similar gears 53, 53, mounted loosely on a shaft 54 journaled transversely in the frame 34. A clutch member 55 is feathered to the shaft 54 and shiftable to engage either gear 53 to communicate movement in reverse directions to the conveyer apron. The shaft 54 is connected in any suitable manner to the motor 16 of the machine. This form of conveyer mechanism which renders it possible to deliver the diggings at either side of the machine is of special value in street scalping work, as very often it is not possible to have the receiving wagons disposed at all times at the same side of the machine.

In the use of my improved machine the first three cuts are made in the usual manner, that is, the machine is worked forward and backward in the making of the three cuts with the tractor wheels 2 and 3 thereof both traveling on the ground surface at the sides of the trench as shown in Figs. 130

5, 6 and 7. If it is desired to widen the excavation beyond the width of three cuts, or in other words, beyond the width of the space between the tractor wheels, as in wide ditch work or in street scalping work, the tractor wheel 3 and its shaft section 3^a are removed from the truck frame 1 and the wheel is mounted within the rear end portion of the swinging frame 8 upon the short axle section 31 which is inserted in the frame bearings 30 for such purpose. This having been done the operator throws into operation the gearing which connects the motor to the clutch shaft 20, if such gearing is not already in operation, and then shifts the clutch shifting member 22 to effect a driving of the proper gear 21 to communicate a lowering movement to the bars 10 and wheel carrying frame 8 through the connecting mechanism. The wheel 3, having been thus lowered into the cut in position to travel on the bottom thereof, is locked against raising relative to the truck frame by the locking action of the worm and worm-wheel 25 and 26. It is thus apparent that the excavating operation may now be continued to widen the cutting to any desired extent with the tractor wheel 2 operating on the ground or bank surface at the side of the cut in the direction in which the cut is progressing, while the tractor wheel 3 travels within the cut on the bottom thereof. It is to be understood, of course, that the adjusting movements and digging action of the cutting wheel are the same as in other machines of this character, or may be controlled in any suitable manner.

I wish it understood that my invention is not limited to any specific construction or arrangement of the parts except in so far as such limitations are specified in the claims.

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

1. In a machine of the class described, the combination with a truck frame, and opposing supporting wheels therefor, of vertically adjustable means carried by the frame at the same end thereof as said wheels and between the vertical planes of such wheels and capable of carrying a supporting wheel to permit a lowering thereof into a cut.

2. In a machine of the class described, the combination with a truck frame, and opposing supporting wheels therefor, of means carried for vertical swinging movements by the frame at the same end thereof as said wheels and between the vertical planes thereof and capable of carrying a supporting wheel to permit a lowering thereof into a cut.

3. In a machine of the class described, the combination with a truck frame, and opposing supporting wheels therefor, one of such wheels being removable, of vertically ad-

justable means carried by the frame between the vertical planes of said wheels and capable of carrying the removable one of such wheels to permit a lowering thereof into a cut, and means for adjusting said first mentioned means and locking it in adjusted position.

4. In a machine of the class described, the combination with a truck frame, and opposing tractor wheels carried thereby, one of said tractor wheels being removable, of mechanism having a part disposed between said wheels and capable of carrying the removable one of said wheels for vertical adjustment, and common drive means for said wheels.

5. In a machine of the class described, a truck-frame, wheel carrying means at opposite side portions of the frame, wheels carried by said means, and vertically adjustable means carried by the frame between the vertical planes of said first means and adapted to carry a wheel between the positions of said first mentioned wheels for coöperating with one of said wheels to support the frame.

6. In a machine of the class described, a truck-frame, frame supporting wheels carried at opposite sides of the longitudinal center of the frame, and means carried by the frame for vertical swinging adjustment and adapted to carry a wheel between the positions of said first mentioned wheels for coöperating with one of said frame supporting wheels to support the frame.

7. In a machine of the class described, a truck-frame, supporting wheels therefor, excavating means between the paths of movements of said wheels, and vertically adjustable means for carrying a frame supporting wheel at one side of the path of movement of the excavating means and between said supporting wheels.

8. In a machine of the class described, a truck-frame, supporting wheels at opposite sides of the frame, excavating means carried by the frame between the paths of movements of said wheels, and vertically adjustable means carried by the frame between said wheels and at one side of the path of movement of the excavating means and adapted to carry a wheel for coöperating with one of said frame supporting wheels to support the frame.

9. In a machine of the class described, a truck-frame, supporting wheels at opposite sides of the frame, excavating means carried by the frame, vertically adjustable means carried by the frame between said wheels and at one side of the path of movement of the excavating means and adapted to carry a wheel to coöperate with one of said supporting wheels to support the frame, and mechanism operable to adjust said wheel carrying means.

10. In a machine of the class described, a truck-frame, a sectional axle carried by the frame, at least one of such sections being removable, supporting wheels carried by
5 said axle sections, one of said wheels being removable, a wheel carrying frame mounted for vertical adjustment within the truck-frame and adapted to be retained in a predetermined position of adjustment by one of
10 said axle sections, a separate axle section capable of being carried by said wheel carrying frame, when the removable one of said

axle sections is removed, said frame and the axle section carried thereby being capable of carrying the removable one of such wheels 15 to permit a lowering thereof into a cut.

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

LEO A. KRUPP.

Witnesses:

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CHARLES E. JORDAN.