

W. J. DANKEL & C. E. VAN PELT.
GRADER OR EXCAVATING MACHINE.
APPLICATION FILED MAR. 12, 1913.

1,216,779.

Patented Feb. 20, 1917.

3 SHEETS—SHEET 1.

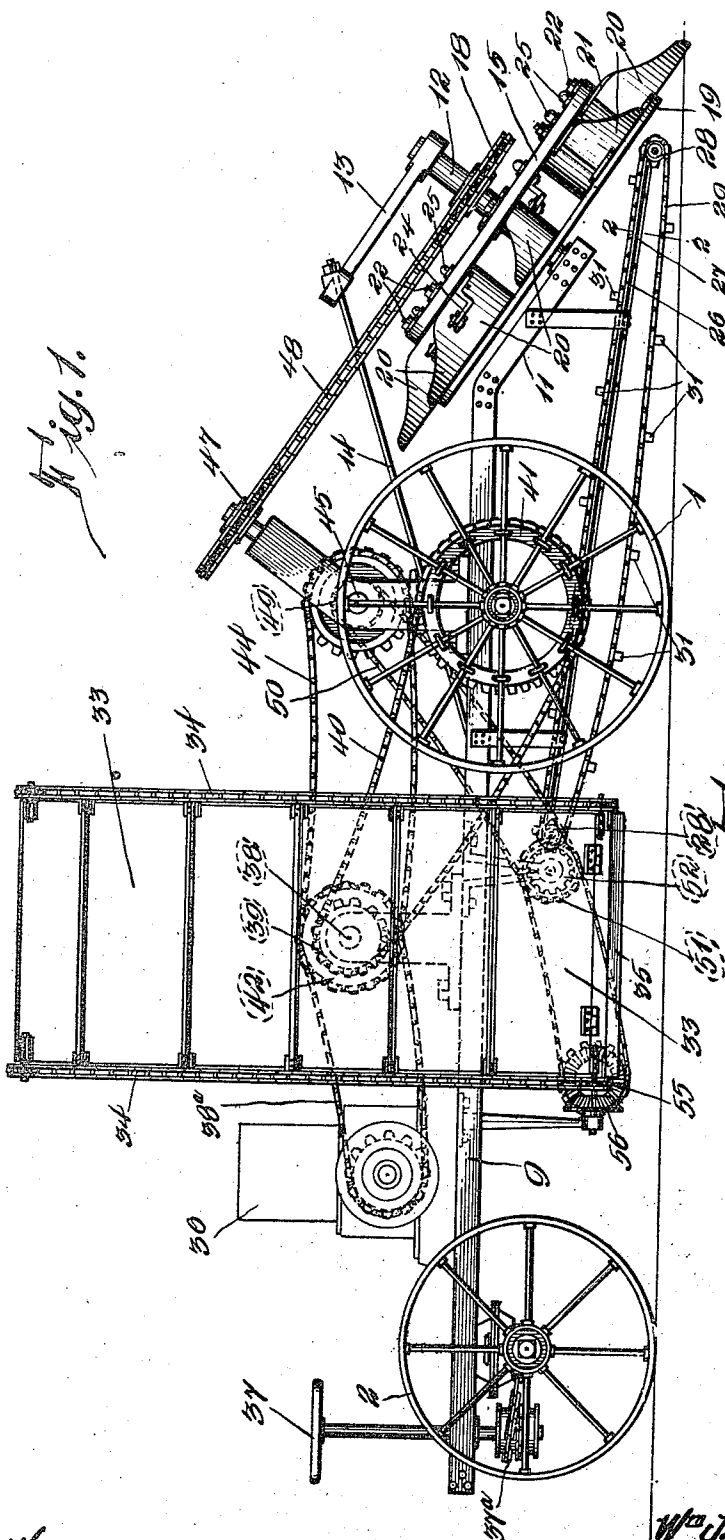
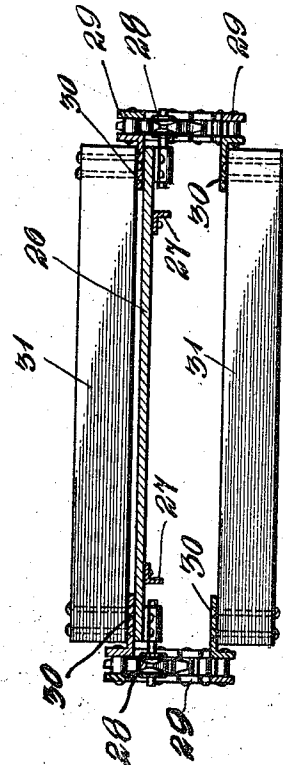


Fig. 2.

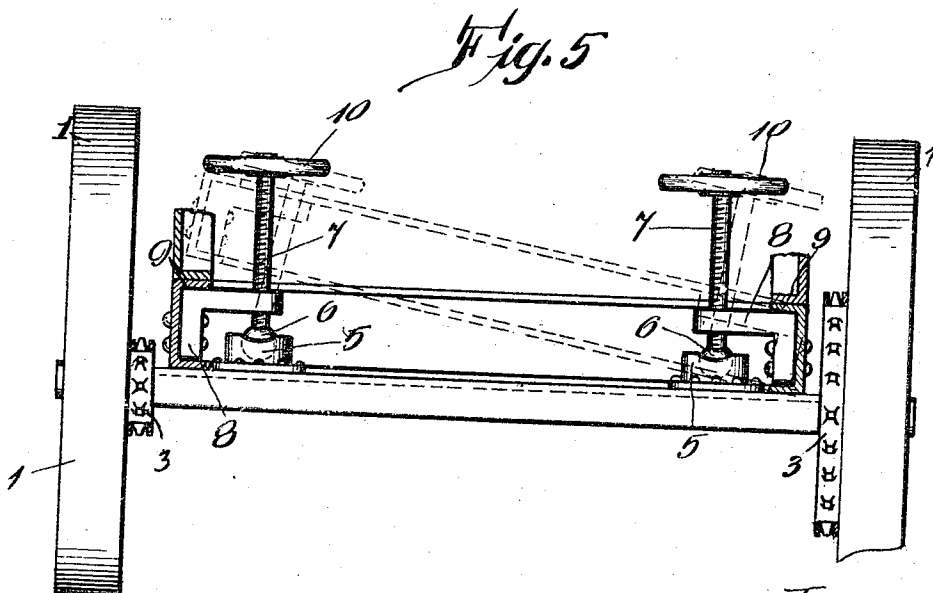
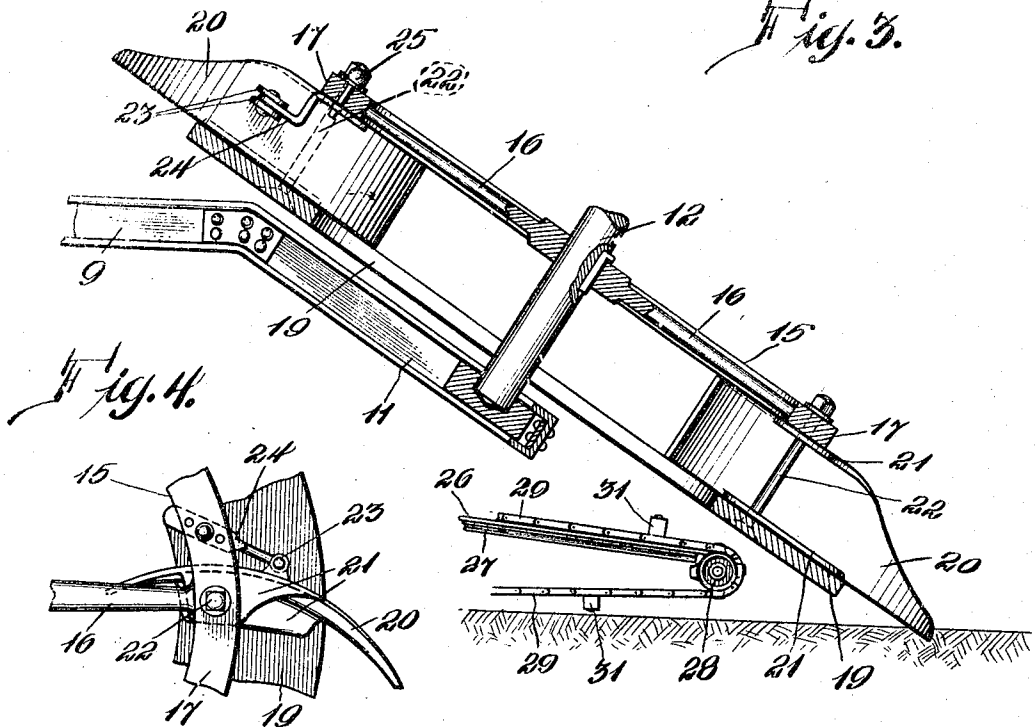


Witnesses:
Arthur M. S. Phillips
A. S. Phillips

Inventors:
W. J. Dankel & C. E. Van Pelt,
by Chas. C. Dillman
Attorney.

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 3 SHEETS—SHEET 2.



Witnesses:
 Arthur Kelley
 A. S. Phillips

Inventors:
 W. J. Dankel & C. E. Van Pelt,
 by Chas. C. Hillman
 Attorney.

1,216,779.

3 SHEETS—SHEET 3.



Witnesses:
Arthur Wesley
O. S. Phillips

Indentors:
W^m. J. Dankel & C. E. Van Pelt,

Chas. Hillman
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM J. DANKEL, OF VILLA GROVE, AND CLARENCE E. VAN PELT, OF SALEM,
ILLINOIS.

GRADER OR EXCAVATING-MACHINE.

1,216,779.

Specification of Letters Patent.

Patented Feb. 20, 1917.

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To all whom it may concern:

Be it known that we, WILLIAM J. DANKEL, a citizen of the United States, and a resident of Villa Grove, in the county of Douglas and State of Illinois, and CLARENCE E. VAN PELT, a citizen of the United States, and a resident of Salem, in the county of Marion and State of Illinois, have invented certain new and useful Improvements in Graders or
10 Excavating-Machines, of which the following is a specification.

Our invention has relation to excavating machines, but more particularly to that class of excavators mounted upon self propelling trucks and is adapted to be operated continuously while the truck is in forward motion. The prime object of our invention is to provide such a machine having a continuously rotating series of shovels adapted
20 to scoop up the dirt or soil and to deliver the same to conveyers, loading the dirt directly into adjacent wagons or cars, whereby a continuous discharge of excavated dirt will be accomplished and the loss of time consumed in filling and dumping the shovels
25 or scoops of the common types of excavators or steam shovels now in use will be saved.

A further object of our invention is to provide a machine in which the excavator or shovel wheel is mounted at an angle with respect to the ground, so as to provide room for the positioning therebeneath of a conveyor for receiving the dirt as it is excavated by the shovels or scoops of the wheel.
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Other objects are to provide simple means for manipulating the machine to adjust the angle and depth of its cut to varying situations, for reversing the movement of the truck without stopping the propelling engine and for adjusting the delivery of the excavated dirt by the conveyers.
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To this end our invention consists of the truck and equipment shown in the accompanying drawings, in which—
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Figure 1 is a side elevation of our excavating machine;

Fig. 2 is an enlarged section taken through a conveyer portion of the machine,
50 as along the line 2—2 of Fig. 1;

Fig. 3 is an enlarged sectional view of the excavating wheel and of a part of the conveyer adjacent to the same;

Fig. 4 is a detail showing one of the shovels or scoops of the excavator wheel; 55

Fig. 5 is an enlarged sectional view showing the method of tilting the frame carrying the operating mechanism of our machine;

Fig. 6 is a top plan view of the machine, 60 and

Fig. 7 is a section showing the transverse conveyer of our machine.

Referring specifically to the drawings, the truck forming part of our invention has forward wheels 1, and smaller rear wheels 2, all preferably of metal and mounted upon suitable axles 3 and 4, respectively. In practice, the wheels 2, are used for steering purposes, while either one or both of the wheels 70 1, are used for driving the truck. One of the axles has upon its upper side a pair of sockets 5, fitting balls 6, at the end of adjusting screws 7, threaded through brackets 8, upon the frame 9, of the machine. 75 Each of these screws 7, may be rotated by a hand wheel 10, thereby raising the adjacent part of the framework 9, from the axle and permitting this framework to be tilted in any direction by moving one of the 80 screws 7, more than the other, as for example, in Fig. 5.

At the forward end of the truck, the frame 9, is tilted downwardly, as shown by the portion 11, in Fig. 3. Mounted on a suitable 85 bearing carried by the tilted portion 11, of the frame 9, near its end, is the lower end of a shaft 12, arranged at right angles to the tilted portion 11, and pivoted at the upper end is a yoke 13, supported by suitable 90 braces 14, anchored to the frame 9. Mounted upon this shaft 12, near its center is a wheel 15, having spokes 16, leading to a rim 17. Also mounted on the shaft 12, above the wheel 15, is a sprocket wheel 18. Below the 95 wheel 15, and parallel therewith and forming a part of the same, is a flat ring 19, of steel and which is supported by a plurality of bolts 22, from the rim 17, and will therefore rotate with the wheel 15, sprocket 18, 100

and shaft 12. It will be noted that the tilt or angle at which the excavator wheel normally rotates is such that the tip of the outermost of the digging members carried thereby will enter the ground a slight distance.

Interposed between the wheel 15, and the ring 19, are a series of shovels or scoops 20, preferably made of steel and having tapered ends projecting a suitable distance beyond the periphery of the ring 19. Each of the scoops or shovels 20, has a pair of perforated ears 21, adapted to slip over one of the bolts 22, and also is provided with a pair of lugs 23, formed on the back of the shovel, and from which a brace 24 leads to the rim 17 of the wheel 15, as most clearly shown in Fig. 4. The brace 24, is fastened to said rim 17, by a pin 25, passing through one of a plurality of holes formed in the said brace, and by shifting the pin 25, from one to another of these holes, the shovel 20, may be moved relative to the ring 19, so as to vary the distance to which the tip of the shovel projects beyond the edge of the ring 19, and likewise to vary the angle at which the scoop will enter the ground.

When the machine is driven into a bank or mound to be removed the rotation of the shovel wheels will cause the shovels 20, to plow through the earth as they come in contact therewith, and the excavated dirt will slide up the inner surface of the shovels 20, onto the flat ring 19, and drop off the inner edge of said ring. Projecting below this inner edge of the ring 19, is the forward end of a sheet metal conveyer bottom 26, supported by the frame 9 of the machine, and which may be stiffened by suitable angle steel formations 27. Mounted at each end and on opposite sides of the conveyer bottom 26, are sprocket wheels 28, guiding chains 29, the links of which chains mesh with the teeth of the sprockets 28. Certain of the links of each chain 29, adjacent the edges of the conveyer bottom 26, are formed with an extension or bracket 30, and these brackets upon the two chains extend toward each other and slide upon the upper surface of the conveyer bottom 26, (as shown in Fig. 2), thereby providing a common support for a scraper bar 31, preferably formed of wood. When the conveyer chains 29, are in motion, these scraper bars 31, will move the dirt dropped upon the conveyer bottom from the inner edge of the ring 19, and carry the same to the rear or inner end of the conveyer. When the dirt drops off the end of the conveyer 26, it falls upon another conveyer bottom 32, extending transversely of the truck of the machine and supported to the frame 9, by suitable braces in a horizontal position. Hingedly connected to the conveyer 32, is

the lower end of a similar conveyer bottom 33, which may be positioned at varying angles to the horizontal. Mounted on the under sides of the conveyer bottoms 32 and 33, near the ends thereof, are suitable sprocket wheels over which pass link chains 34, similar to the chains 29, of the conveyer 26, and which also carry scraper bars 35, adapted to push the dirt on the said conveyer bottom 32, laterally of the truck and up the inclined conveyer bottom 33, from the end of which latter the dirt may drop directly into an adjacent cart or car and be carried away. When the machine is not in operation, the inclined portion 33, of the laterally extending conveyer may be drawn up close to the side of the machine by means of suitable cables.

For actuating the machine of our invention, we preferably provide a gasoline engine indicated at 36, mounted near the rear of the truck so as to be easily reached by an operator positioned close to the steering wheel 37, which is connected through chains 37^a, to the ends of the axle 4, for turning the same relative to the frame of the machine. The crank shaft of the engine 36, is connected by a link chain 38^a, with a power shaft 38, one end of which carries a sprocket 39, connected by a chain 40, to a sprocket 41, fixed on one of the forward wheels 1. The shaft 38, loosely carries a sprocket 42, which may be thrown into and out of co-action with the shaft by a manually operable clutch 43, and from which a chain 44, drives a secondary shaft 45, connected by bevel gears 46, by a sprocket 47, and a chain 48, with the sprocket wheel 18, of the shaft 12, carrying the excavator wheel 15. The secondary shaft 45, also carries a sprocket 49, connected by a chain 50, to a sprocket 51, supported by the frame 9. Mounted on the shaft of the sprocket 51, is a spur gear 52, which meshes with the teeth of another spur gear 53, fixed to the shaft of one of the sprocket wheels 28, of the conveyer chains 29, thereby causing said chains to be moved along the longitudinal conveyer 26, toward the rear of the machine. Also fixed to the shaft of the sprocket 51, is a similar sprocket 54, which is connected to a combined sprocket and bevel gear 55, carried by the frame 9, and which imparts motion to a bevel gear 56, fixed to the shaft of one of the sprocket wheels over which the scraper-chains 29 pass and through which gearing these scraper chains of the transverse conveyers are operated.

Consequently, when the engine 36, is in motion and the clutch 43, is in its engaging position, the engine will simultaneously propel the truck, rotate the excavator wheel

and actuate both the longitudinal and transverse conveyers. By varying the tilt of the frame 9, of the machine, the shovels or digging members 20, of the excavator wheel 5 may be caused to enter the ground to a greater or less depth, thereby proportioning the rate of the excavating to the nature of the soil. In case difficulties are encountered, the excavator wheel may be raised 10 to clear the same by manipulating the hand wheels 10 (which may be done without stopping the engine) or the truck may be backed up by throwing out the clutch 43, and reversing the engine through a suitable reversing gear operated by a lever 57.

When transporting the machine from place to place, the adjusting screws 7, above the axle 3, may be raised to bring the excavator wheel a sufficient distance from the 20 ground so that the outermost of the shovels 20, will clear the ground and thereby not interfere with the travel of the machine.

It will be evident from the above that when the excavator wheel is in operation 25 the rotation of the ring 19, will coact with the shovels 20, to cause the freshly excavated dirt to slide the previously excavated dirt inwardly of the said ring and to drop the same through the interior thereof upon 30 the longitudinal conveyer. Thus the ring 19, not only supports the shovels 20, but also conveys the dirt from the shovels to the first of the conveyer platforms.

While we have shown and described our 35 invention in its preferred embodiment, it will be understood that various changes may be made without departing from the scope of the appended claims. For instance, a greater or less number of shovels than 40 shown might be carried by the excavator wheel.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent, is—

45 1. An excavating machine comprising a truck, a framework movably mounted thereon and means for tilting the same laterally, an excavator wheel rotatably mounted upon one end of said framework 50 and comprising a plurality of shovels and a soil sliding rotary ring, a conveyer adapted to receive soil when slid off the said ring, and driving means for simultaneously rotating the said excavator wheel, 55 moving the truck and actuating the conveyer.

2. An excavating machine comprising a truck, a framework movably mounted thereon and means for tilting the same 60 laterally, an excavator wheel rotatably mounted upon one end of said framework and comprising a plurality of shovels and a soil sliding rotary ring, a conveyer

adapted to receive the soil when slid off the said ring, and a second conveyer positioned to receive the soil from the first conveyer and to deliver the same laterally of the truck, and driving means for simultaneously rotating the said excavator wheel, moving the truck and actuating the conveyers. 65

3. An excavating machine comprising a truck, a framework movably mounted thereon and means for tilting the same laterally, an excavator wheel rotatably 75 mounted upon one end of said framework and comprising a plurality of shovels and a soil sliding rotary ring, a conveyer adapted to receive the soil when slid off the said ring and a second conveyer positioned to receive the soil from the first conveyer and to deliver the same laterally of the truck at a height above the framework of the truck. 80

4. In an excavator, a soil moving member 85 comprising a wheel, the axis thereof being oblique to the horizontal; bolts depending from the said wheel near its periphery; a substantially flat ring supported by the lower ends of the bolts; and a plurality of 90 digging members mounted upon the said bolts intermediate of the said wheel and ring.

5. In an excavator, a soil moving member comprising a wheel, the axis thereof being 95 oblique to the horizontal; bolts depending from the said wheel near its periphery; a substantially flat ring supported by the lower ends of the bolts; a plurality of digging members, the said digging members 100 being adjustable as to their projection beyond the periphery of the said ring, mounted upon the said bolts intermediate of the said wheel and ring.

6. An excavating machine comprising a 105 truck, a framework movably mounted thereon and means for tilting the same laterally, an excavator wheel rotatably mounted upon one end of said framework and comprising a plurality of shovels and 110 a soil sliding rotary ring, a conveyer adapted to receive the soil when slid off the said ring, driving means for simultaneously rotating the said excavator wheel, moving the truck and actuating the conveyer, and means for simultaneously disconnecting the excavator wheel and conveyer from the driving means. 115

7. An excavating machine comprising a truck, a framework movably mounted 120 thereon and means for tilting the same laterally, an excavator wheel rotatably mounted upon one end of said framework and comprising a plurality of shovels and a soil sliding rotary ring, a conveyer 125 adapted to receive the soil when slid off

the said ring and an adjustably mounted second conveyer positioned to receive the soil from the first conveyer and to deliver the same laterally of the truck, and driving means for simultaneously rotating the said excavator wheel, moving the truck and actuating the conveyers.

In witness whereof, we have hereunto

subscribed our names hereto, this 6th day of March 1913, in the presence of two subscribing witnesses.

WILLIAM J. DANKEL.

CLARENCE E. VAN PELT.

Witnesses:

CHAS. C. TILLMAN,

A. S. PHILLIPS.