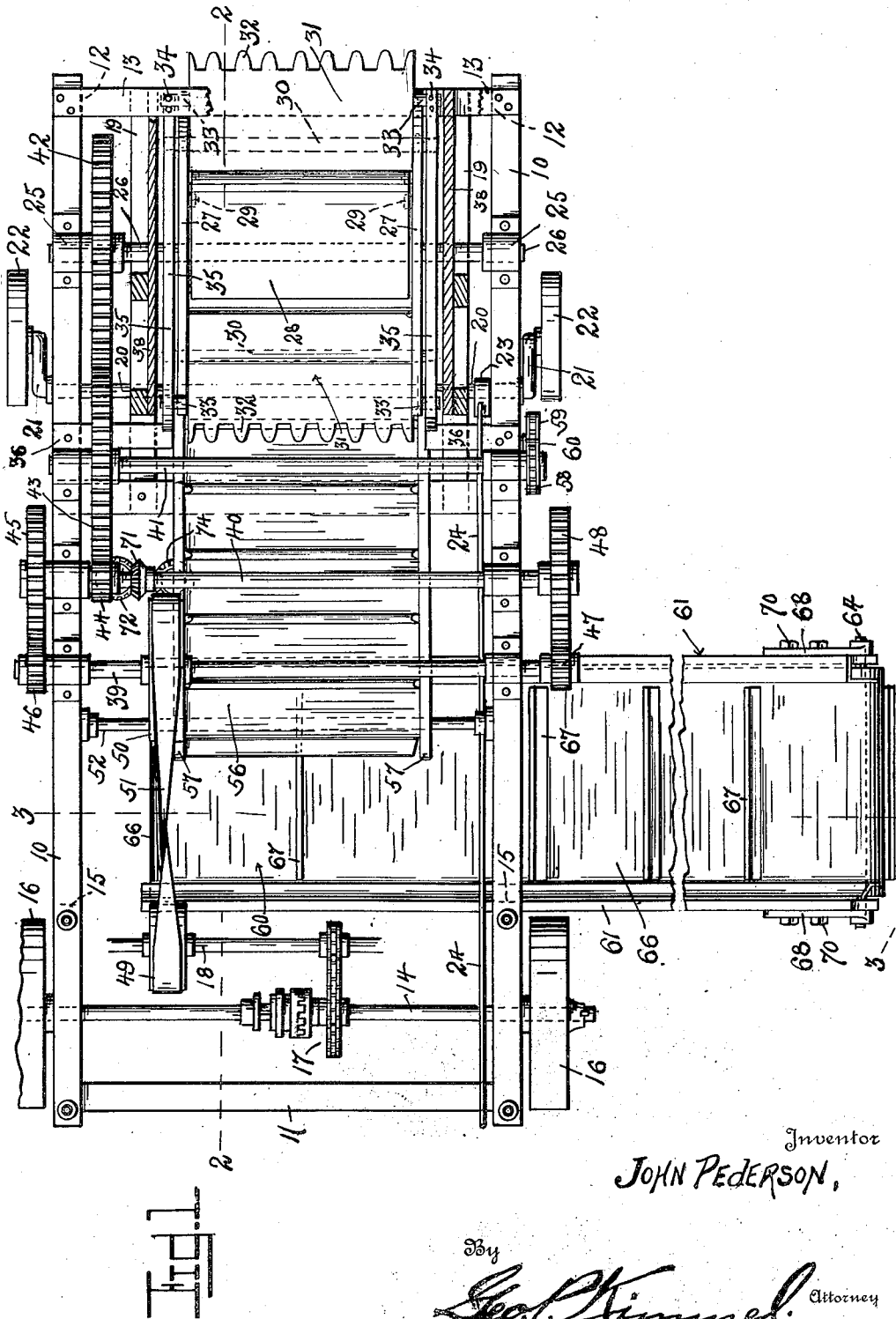


J. PEDERSON.
EXCAVATOR.
APPLICATION FILED OCT. 5, 1920.

1,414,201.

Patented Apr. 25, 1922.

3 SHEETS—SHEET 1.



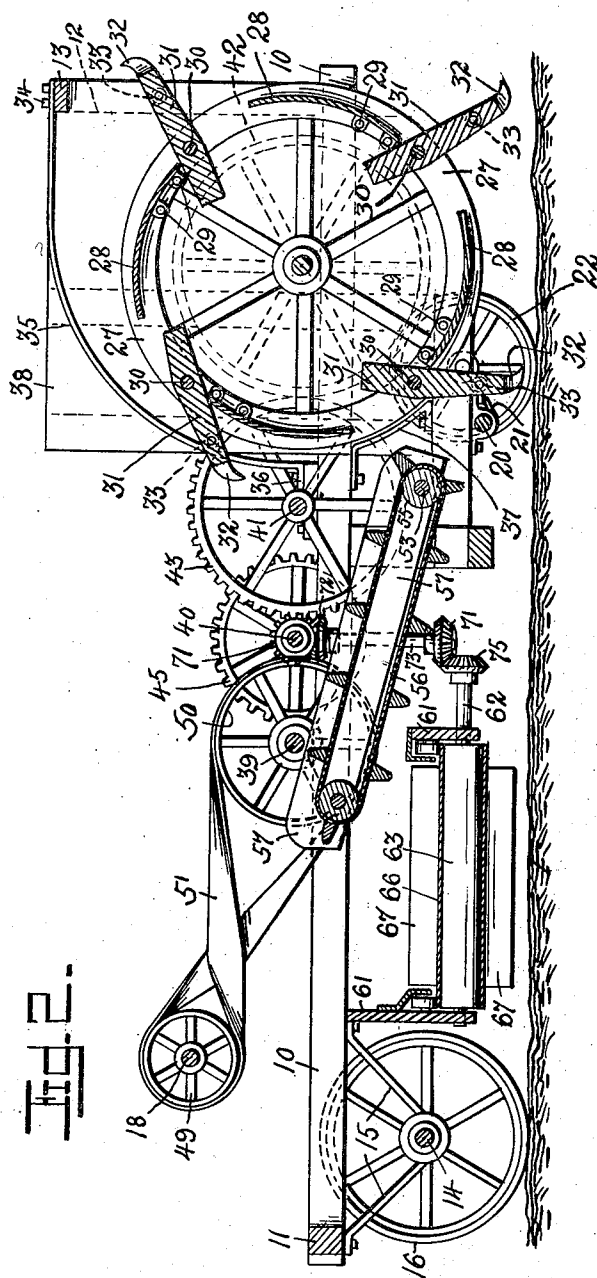
Inventor
JOHN PEDERSON,

By *Geo. P. Himmel* Attorney

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3 SHEETS—SHEET 2.



萬年

INVENTOR.

JOHN PEDERSON.

BY

BY
Geo. P. Kimmel.

ATTORNEY.

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3 SHEETS—SHEET 3.

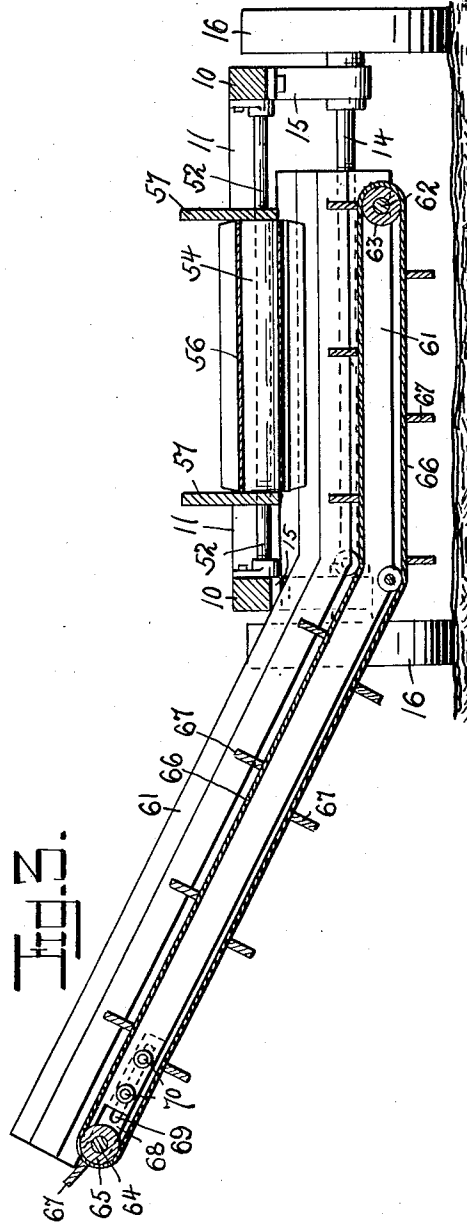


Fig. 3.

Inventor
JOHN PEDERSON.

By
Geo. P. Kimmel. Attorney

UNITED STATES PATENT OFFICE.

JOHN PEDERSON, OF ZUMBROTA, MINNESOTA.

EXCAVATOR.

1,414,201.

Specification of Letters Patent. Patented Apr. 25, 1922.

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To all whom it may concern:

Be it known that I, JOHN PEDERSON, a citizen of the United States, residing at Zumbrota, in the county of Goodhue and State of Minnesota, have invented new and useful Improvements in an Excavator, of which the following is a specification.

This invention relates to grading and excavating machines of the class for transferring gravel, clay, or the like from a bank or other deposit to a car, wagon or other receptacle, and has for one of its objects to simplify and improve the construction, and increase the efficiency and utility of a device of this character.

Another object of this invention is to produce a device of this character including an apparatus of improved construction which loosens and elevates the material and deposits on suitable conveying devices whereby it is conducted to the car, wagon or other receptacle.

With these and other objects in view, the invention consists in certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims, and in the drawings illustrative of the preferred embodiment of the invention.

Figure 1 is a plan view, partly in section, of the improved apparatus,

Fig. 2 is a longitudinal section on the line 2—2 of Fig. 1,

Fig. 3 is a transverse section on the line 3—3 of Fig. 1.

The improved apparatus includes a supporting frame formed of side rails 10, a rearward transverse member 11, vertical standards 12 at the forward ends of the side rails and connected at the upper ends by an elevated transverse member 13.

A rear axle 14 is supported beneath the frame member 10 as by suitable hangers 15, and carries traction wheels 16, rotative with the axle.

A suitable driving mechanism represented conventionally at 17, is attached to the axle 14 and operative from a suitable motor shaft represented at 18, the motor not being shown as it forms no part of the present invention.

The supporting frame likewise includes longitudinal strut members 19, and mounted beneath the strut members is a rock shaft 20. The rock shaft carries crank arms 21 having ground wheels 22 at their ends. The shaft 20 likewise carries an arm 23 from which a

rod 24 leads to a point convenient to the operator.

By this arrangement the forward part of the frame may be elevated or depressed to control the depth of cut of the excavating mechanism, as hereafter more fully explained.

Supported in bearings 25 on the forward part of the frame members 10, is a relatively heavy shaft 26, which carries coacting head members or wheels 27.

Extending between the confronting faces of the members 27 are curved gather plates 28 and each attached near one edge as at 29 to the members 27, leaving the remaining portions of the plates unconnected and slightly yieldable. Any required number of the plates 28 may be employed, but for the purpose of illustration, four of the plates are shown.

Extending through the members 27 near the attached edge of each of the plates 28, is a supporting rod 30, and mounted to swing on each rod is a shovel device comprising a relatively heavy body portion 31 having teeth 32 at one edge. The rods 30 extend through the body portions farther from the toothed edge than from the inner or untoothed edge so that the major portion of the body is in advance of the pivot rod so that the body portions will swing by gravity on the rods.

Each body member 31 is also provided at each end with an outwardly extending roller 33, and attached at 34 at one end to the transverse member 13 are curved guide straps 35 beneath which the rollers contact as the wheels 27 rotate, as hereafter explained.

The straps 35 are eccentric to the wheels 27 and the paths of the members 31 and their rollers 33, and are formed with lateral extensions 36 at their lower ends to enable them to be attached to the rail members 10, as shown in Fig. 1.

Attached at their ends respectively to the rail members 10 and struts 19 are other guide strips, one of which is shown at 37, and against the inner faces of which the rollers bear as the wheels are rotated.

The wheel members 27, plates 28 and swinging members 31 constitute an excavating drum, and will be thus referred to hereafter.

As the excavating drum is rotated by means hereafter described, the members 31

with their teeth 32 consecutively engage the material to be excavated and force a quantity over the upper surface of the members 31 and against the adjacent plate 28, one of the members 31 and the adjacent plate 28 coacting to form a bucket to hold the material while passing upwardly toward the transverse member 13.

As the loaded "buckets" pass upwardly and to the rear, the rollers 33 pass beneath the straps 35 and the members 31 are gradually turned into the position shown at the upper left of Fig. 2, and causing the load to be discharged.

As the rotation of the drum continues, the rollers 33 consecutively engage the strips 37, thereby causing the further deflection of the buckets and causing them to be withdrawn to a sufficient extent to pass the "slats" of the first conveyor device, as hereafter explained. As the rollers of the "buckets" pass the lower ends of the curved guide strips 37, they are caused to assume the position shown at the lower part of Fig. 2, by gravity ready to again act on the material to be excavated.

The plates 28 being unsupported for the major portion of their widths, yield under abnormal strains or pressure, and thus prevent breakage.

Lateral guard members 38 are supported on the strut members 19 and spaced a short distance from the guard straps 35.

Shafts 39, 40 and 41 are mounted for rotation on the rail members 10.

Mounted on the shafts 26 and 41 are interengaging gears 42 and 43.

The gear 42 also engages with a pinion 44 on the shaft 40, while a gear 45 on the shaft 40 engages with a pinion 46 on the shaft 39.

The shaft 39 also has a pinion 47 on the opposite end engaging with a gear 48 on the shaft 40.

The motor shaft 18 is provided with a belt pulley 49 and the shaft 39 is provided with a belt pulley 50, a belt 51 passing around the pulleys 49 and 50, and preferably twisted to secure the requisite direction of motion to the shafts and gears.

Mounted for rotation between the frame members are other shafts 52 and 53 carrying drums or rollers 54 and 55 over which a slatted belt 56 operates. These shafts, drums and belts are enclosed by guard boards 57 and are inclined and constitute conveyor device with the lower end in position to receive the material discharged from the buckets.

Mounted on the shaft 41 is a chain pulley 58 while a similar chain pulley 59 is mounted on the extended end of the lower shaft 53 of the conveyor. By this means motion is imparted to the conveyor.

Disposed transversely of the supporting frame are side boards 61, parts of the side

boards extending horizontally below the line of the frame and the remaining portion inclined outwardly and upwardly away from the frame, as shown in Fig. 3.

A shaft 62 is supported in the horizontal portions of the guide boards and carries a belt drum 63 while a similar shaft 64 extends transversely of the guide boards at the opposite ends and carries a belt drum 65.

A belt 66 passes around the drums 63 and 65 and is provided with flight members 67 spaced at suitable distances.

The shaft 64 is journaled at the ends in plates 68 each having a longitudinal slot 69 through which clamp bolts 70 pass and into the side boards 61. By this means simply constructed tension devices are constructed whereby the tension of the belt 66 is maintained.

Mounted upon the shaft 40 is a bevel pinion 71 engaging a like bevel pinion 72 on an obliquely supported shaft 73, the latter likewise carrying a bevel pinion 74 at its lower end engaging a bevel pinion 75 on the shaft 62.

By this means the motion of the shaft 40 is transmitted to the elevator mechanism.

With a device thus constructed, when moved forwardly by motion imparted to the rear axle and corresponding motion imparted to the excavating drum and conveyor and elevating devices, the material will be gathered upon the swinging members 31 and against the plates 28 and carried over the drum and deposited on the conveyor belt 56 and thence to the elevator belt 66 and thence discharged in a suitable receptacle, not shown.

I claim:

1. In an excavating apparatus, a drum mounted for rotation and comprising spaced ends and segmental plates connecting the ends, the confronting edges of said plates being in spaced relation, a shovel member pivoted at one side of the center within each of said spaces and swinging freely therein, said segmental plates cooperating with the bucket members to support the load while being carried over the drum means for rotating said drum, and means for consecutively disposing said shovel devices in discharging position.

2. In an excavating apparatus, a drum mounted for rotation and including spaced ends, and segmental plates in spaced relation extending between said ends and attached at one edge only thereto leaving the major portions of the plates unsupported and yieldable, shovel devices coacting with the gather plates and extending between said drum ends and swingingly connected thereto, means for rotating said drum, and means whereby said shovels are disposed in discharging position by the rotation of the drum.

3. In an excavating apparatus, a drum

mounted for rotation and including spaced ends and segmental plates in spaced relation extending between said ends, shovel devices coacting with the segmental plates and extending between said drum ends and swing- 5 ingly connected thereto, stop rollers carried by said shovel devices, means for rotating said drum, stationary guide strips disposed in the paths of said rollers, whereby the shovels are consecutively moved into dis- 10 charging position by the rotation of the drum, an endless slotted carrier, and a stop plate between said carrier and drum in position to consecutively deflect the shovel 15 members away from the carrier.

In testimony whereof, I affix my signature hereto.

JOHN PEDERSON.