

No. 736,348.

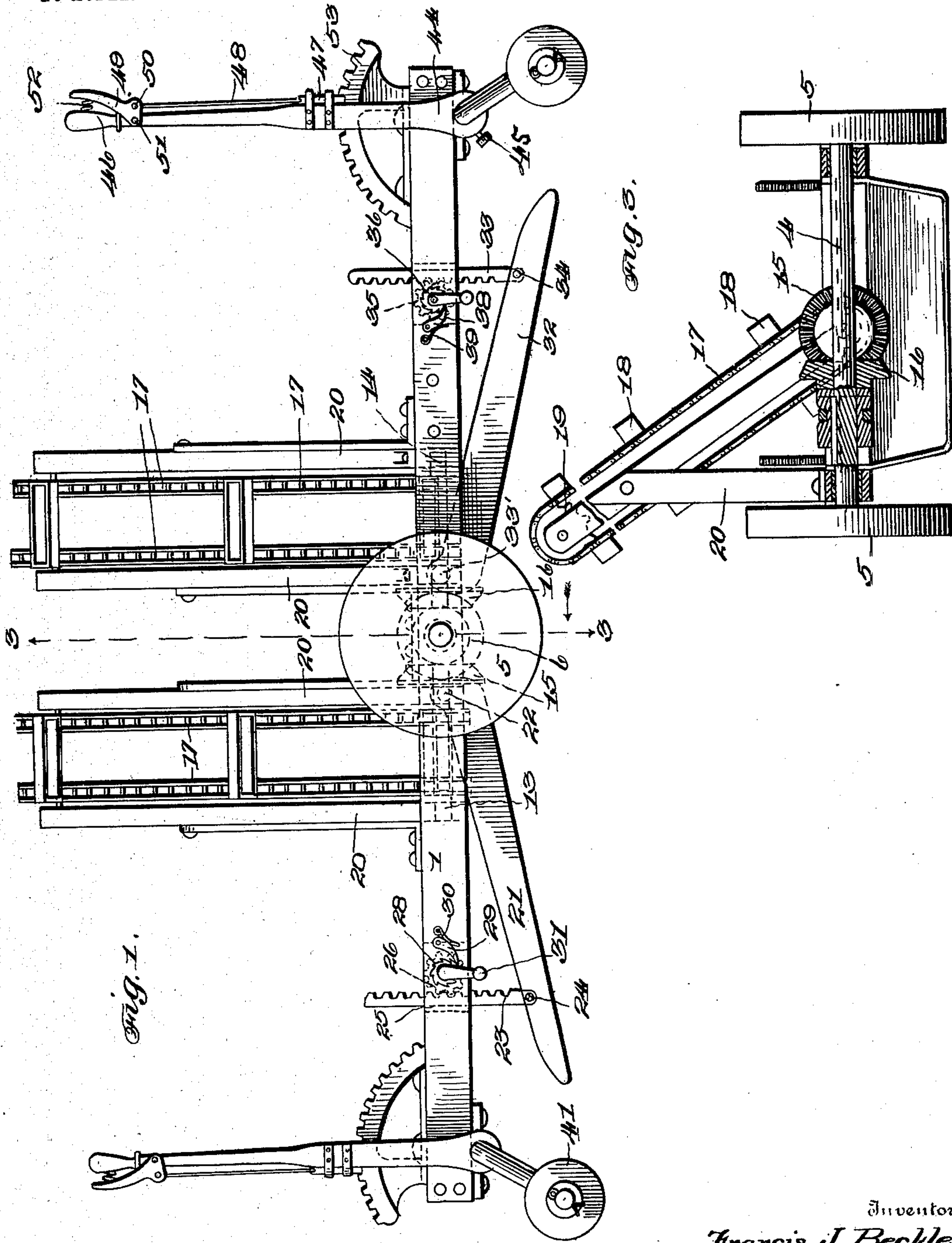
PATENTED AUG. 18, 1903.

F. J. BECKLEY.  
DITCHING MACHINE.

APPLICATION FILED DEC. 17, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## DITCHING-MACHINE.

**SPECIFICATION** forming part of Letters Patent No. 736,348, dated August 18, 1903.

Application filed December 17, 1902. Serial No. 135,654. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS J. BECKLEY, a citizen of the United States of America, and a resident of Royal Center, Cass county, Indiana, have invented certain new and useful Improvements in Ditching-Machines, of which the following is a specification.

This invention relates to certain new and useful improvements in ditching-machines; and it has for its objects, among others, to provide a novel construction of ditching-machine by which the dirt may be automatically carried from the scoop or shovel to the top or side of an embankment, where it may be deposited without loss of time.

It has for a further object to so construct and mount the framework upon which the endless carrier operates that it may be readily raised or lowered to suit the depth and width of ditch and the nature of the soil being operated upon. I also make provision for the raising or lowering of the point of the scoop to accommodate it to the depth and nature of the soil. The scoops may be of any desired width, and any suitable means may be employed for raising and lowering the scoop or scoops as well as the frame on which the endless carrier is mounted. The front and rear wheels are made smaller than the center wheels, as shown, and said front and rear wheels are mounted on crooked or crank axles and provided with suitable means for holding the same in their adjusted position, so that the said wheels may be kept on a level with the middle wheels and beyond either side can be raised when the machine is turned, as will be hereinafter more fully described.

The machine is designed to be suitably covered, so that the operator can stand on top of it and operate it easily.

I provide means for loosening the dirt from the buckets, whereby they are completely emptied of their contents. This means comprises an eccentric operating in conjunction with the wheels over which the endless carriers run and so connected with a hammer as to raise it at predetermined periods and then release it and allow it to drop on the back or bottom of the bucket, striking it with sufficient force to loosen whatever dirt may remain in said bucket.

I aim also at improvements in the details of construction whereby better results are obtained and the machine made more compact and complete and efficient in its operation. 55

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation of my improved ditching-machine. Fig. 2 is a top plan thereof. Fig. 3 is a vertical section on the line 3 3 of Fig. 1. Fig. 4 is an enlarged sectional detail on the line 4 4 of Fig. 2. Fig. 5 is a detail showing the hammer for loosening the dirt from the bucket and its actuating mechanism. 60 65 70

Like numerals of reference indicate like parts throughout the several views.

Referring now to the details of the drawings, 1 designates the side pieces, 2 the end pieces, and 3 the lateral braces, of the frame of the machine. Mounted substantially centrally in suitable bearings in this frame is the axle 4, carrying the wheels 5. Fast on this shaft is a bevel-pinion 6, having a clutch member 7, and slidably mounted on said shaft is the movable clutch member 8, having the annular groove 9, in which engages the fork 10 of the lever 11, pivotally mounted, as at 12, on one of the cross-braces of the frame, as seen clearly in Fig. 2, and designed to operate the movable clutch member to throw it into or out of engagement with the clutch member 7 in a manner which will be readily understood. 75 80 85

13 and 14 are shafts disposed longitudinally of the frame at the center portion and mounted in suitable boxes or bearings on the cross-pieces 3 of the frame, as seen best in Fig. 2, one upon each side of the central shaft 4. On the shaft 13 is a bevel-pinion 15, and on the shaft 14 is a bevel-pinion 16, these two bevel-pinions meshing with the bevel-pinion 6 on the shaft 4, as seen clearly in Figs. 1 and 2, whereby motion is imparted to the endless carriers, which, as seen best in Fig. 2, are disposed upon opposite sides of the machine, so as to deliver and deposit the soil upon oppo- 90 95 100



site sides of the machine or ditch in which the machine may be working. These carriers may be of any well-known or suitable form of construction, in this instance comprising chains 5 17, carrying buckets 18 of any well-known form. These chains are designed to run over suitable sprocket-wheels 19 at the upper and lower end of the frames in which the carriers are mounted. These frames 20 are suitably 10 mounted on the main frame of the machine, to be raised and lowered therewith according to the depth of the soil. The carriers are, as shown, mounted upon opposite sides of the longitudinal center of the frame and are further 15 designed to be operated to take the soil from either end of the ditch, one scoop and carrier operating when the machine is moved in one direction and the other when the same is moved in the opposite direction. It is evident, however, that the improvements herein 20 described may be embodied in a machine having but one scoop and one endless carrier without departing from the spirit of the invention.

21 is a scoop pivotally mounted, as at 22, 25 in any suitable manner, and this scoop may be of any well-known or preferred form of construction. It is shown in this instance as being designed to be raised or lowered at its 30 operating-point, as occasion may require. By this means I employ the rack 23, pivotally mounted, as at 24, on the outer end of the scoop and working through an aperture 25 in the side bar 1.

26 is a gear-wheel mounted on the shaft 27, 35 supported in the side bars 1, and this gear-wheel is adapted to mesh with the rack, as seen clearly in Fig. 1.

28 is a ratchet on the shaft 27, with which 40 meshes a pawl 29, against which acts a spring 30, all as seen clearly in Fig. 1. The shaft is provided with a suitable handle 31, by which it may be operated to raise or lower the end of the scoop, as required. There may be two of 45 these racks and gears and retaining mechanism, one at each end of the shaft 27, if desired, as illustrated in Fig. 2.

When two scoops are employed, the scoop 32 is pivotally mounted, as at 33, and dis- 50 posed at the opposite end of the machine, it being provided with a rack 33, pivoted at 34 and operated by a gear 35 on the shaft 36 and having a ratchet 37, a pawl 38, and a pawl-spring 39, similar to the analogous parts 55 just above described in connection with the scoop 21, and in this instance, as in that just above described, there may be a similar provision at each end of the shaft, as seen in Fig. 2. It will be evident, however, that 60 when two of these racks and gears are employed only one ratchet-and-pawl mechanism will be necessary, as that is all that would be required to hold the shaft against retrograde movement.

65 If desired, a spirit-level may be employed for the purpose of indicating the bottom of

the ditch and to regulate the position of the device. A bail also may be attached to the front of the scoop, to which may be connected the motive power.

The front and rear wheels 40 and 41 are 70 mounted upon bent axles 42 and 43, and the construction is such that by the actuation of these axles the frames may be raised or lowered as may be desired. While any suitable 75 means may be employed for raising or lowering these wheels and for turning the crank-axles, I prefer the construction seen best in Fig. 1, in which 44 is a lever having one end 80 attached to the axle by suitable means, as a set-screw 45, and its other end provided with a suitable handle 46, by which it may be manipulated. 47 is a pawl carried by the 85 rod 48, actuated by a handle 49, to which it is attached at 50 to said handle, being pivoted at 51 on the lever 44, and a spring 52 being provided between the handles of the two levers, 90 as clearly indicated in said Fig. 1. 53 is a segmental rack secured to one of the said timbers 1 of the machine and with which the pawl 47 is adapted to engage to hold the lever 44 in its adjusted position, and thus keep the 95 wheels in their raised or lowered position.

Referring to Fig. 5, there will be seen an arrangement to loosen the earth from the buck- 95 ets. It consists of a wheel or cam 60 on the extended end of one of the shafts of the wheels 19 and designed to be operated by the rotation of said wheels. It is designed to actuate 100 an arm 61, pivotally mounted at 62 and carrying a roller 63, revolving in contact with the cam or wheel 60, the other end bent to form the right-angled portion 64, to which is attached the hammer 65, the timing of the parts 105 being so arranged that the hammer is raised a certain height, and in the further revolution of the wheel the said hammer is released and drops on the back or bottom of a bucket, striking it with sufficient force to loosen what- 110 ever dirt may remain in the bucket, thereby completely emptying the same.

The operation will be apparent from the foregoing description when taken in connection with the annexed drawings, and a further detailed description thereof is not deemed 115 necessary.

What I claim as new is—

1. In a ditching-machine, a frame, supporting-wheels therefor, the axle for said wheels, a scoop at each end of the frame, endless carriers movable transversely of the length of 120 the frame, and means for operating said carriers in opposite directions.

2. In a ditching-machine, a frame, supporting-wheels therefor, the axle for said wheels, 125 endless carriers movable transversely of the length of the frame and means for operating said carriers in opposite directions directly from said axle.

3. In a ditching-machine, the combination 130 of the frame, supporting-wheels and their axle with oppositely-disposed endless carriers,



means for operating the same from said axle, and hinged scoops oppositely disposed and arranged for coöperation with said carriers.

4. In a ditching-machine, the combination  
5 of the frame, supporting-wheels and their  
axle with oppositely-disposed endless carriers,  
means for operating the same from said axle,  
oppositely-disposed hinged scoops arranged  
for coöperation with said carriers, and means  
10 for raising and lowering the scoops.

5. In a ditching-machine, the combination  
of the frame, supporting-wheels and their  
axle with oppositely-disposed endless carriers,  
means for operating the same from said axle,  
15 oppositely-disposed hinged scoops arranged  
for coöperation with said carriers, and front  
and rear wheels mounted on crank-axles.

6. In a ditching-machine, the combination  
of the frame, supporting-wheels and their  
20 axle with oppositely-disposed endless carriers,  
means for operating the same from said axle,  
hinged scoops arranged for coöperation with  
said carriers, front and rear wheels mounted  
on crank-axles, and means for raising and  
25 lowering said crank-axles, and holding them  
in adjusted position.

7. In a ditching-machine, the combination  
of the frame, supporting-wheels and their  
axle with oppositely-disposed endless carriers,  
30 means for operating the same from said axle,  
hinged scoops arranged for coöperation with  
said carriers, front and rear wheels mounted

on crank-axles, and means for raising and  
lowering said crank-axles and holding them  
in adjusted position, said front and rear 35  
wheels being of less diameter than the sup-  
porting-wheels.

8. In a ditching-machine, the combination  
with an endless transversely-disposed carrier,  
of means for jarring the buckets thereof to 40  
loosen the contents.

9. The combination with the endless car-  
rier, of a hammer pivotally mounted and  
adapted to strike the buckets of the carrier,  
as and for the purpose specified. 45

10. The combination with the endless car-  
rier, of a hammer pivotally mounted and  
adapted to strike the buckets of the carrier,  
and means operatively connecting said ham-  
mer with the supporting-wheels of the carrier. 50

11. In a ditching-machine, a supporting-  
frame, supporting-wheels, an axle therefor,  
oppositely-disposed endless carriers opera-  
tively connected with said axle for operation  
therefrom, and hinged scoops oppositely dis- 55  
posed and arranged for coöperation with said  
carriers.

Signed by me at Royal Center, Indiana,  
this 8th day of September, 1902.

FRANCIS J. BECKLEY.

Witnesses:

GEO. W. WALTERS,  
ELIZABETH HOMBURG.