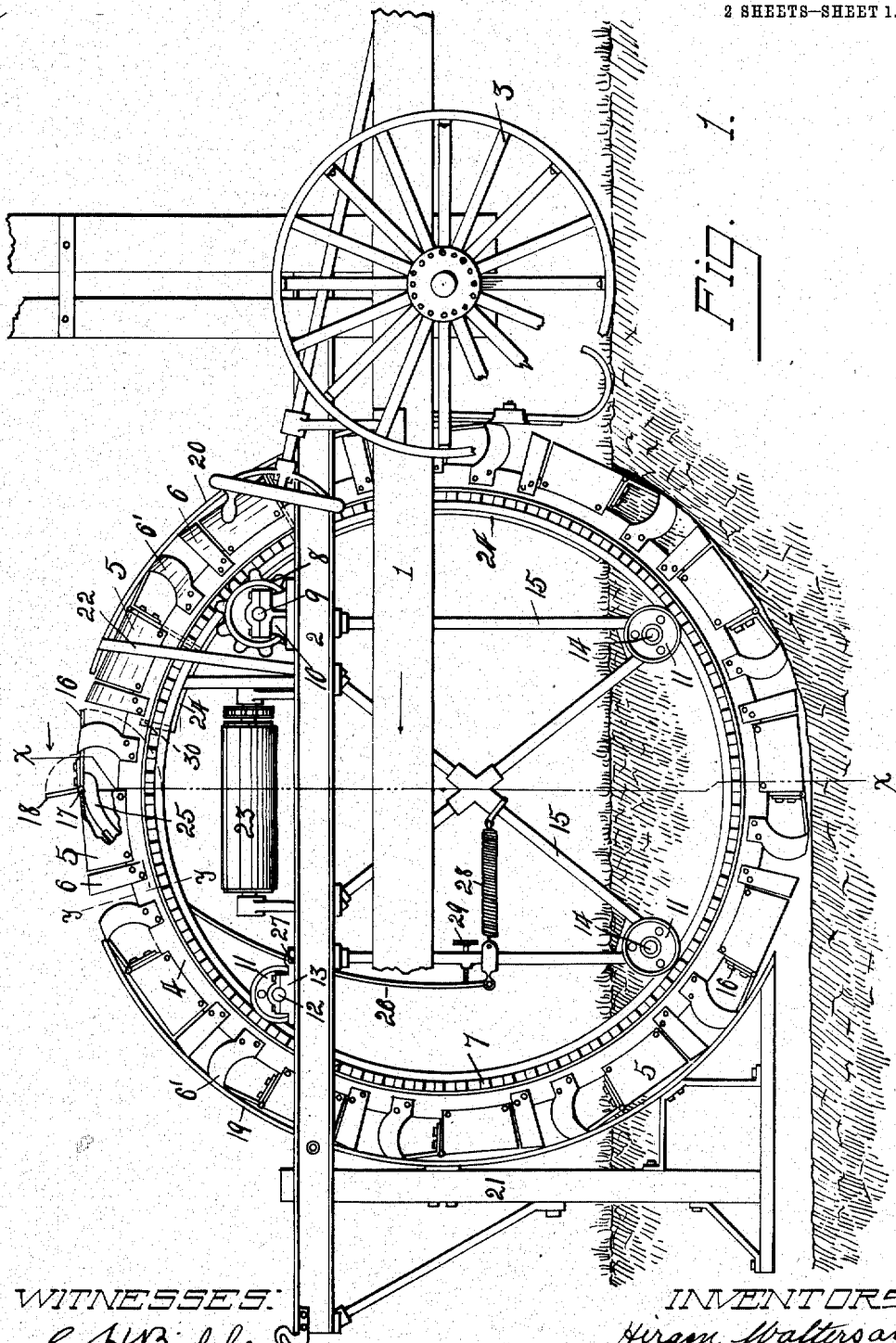


H. WALTERS & N. BUMPUS.  
EXCAVATING MACHINE.  
APPLICATION FILED MAR. 24, 1910.

983,959.

Patented Feb. 14, 1911.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

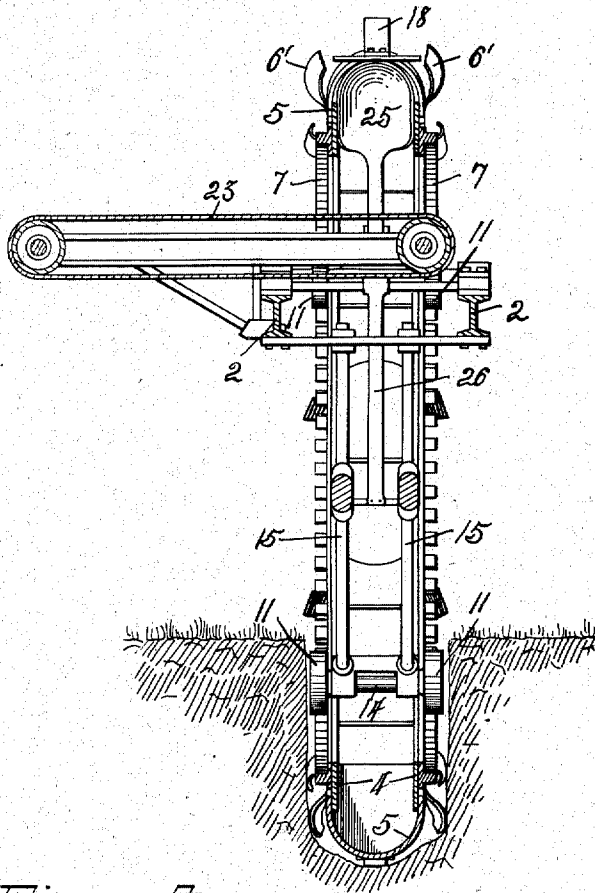
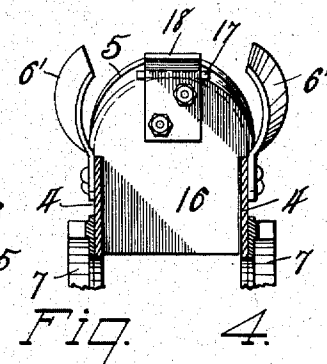
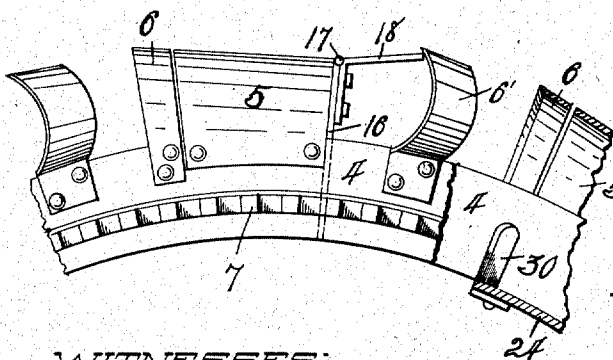


Fig. 3.



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# UNITED STATES PATENT OFFICE.

HIRAM WALTERS AND NATHAN BUMPUS, OF CURTICE, OHIO.

## EXCAVATING-MACHINE.

983,959.

Specification of Letters Patent.

Patented Feb. 14, 1911.

Application filed March 24, 1910. Serial No. 551,324.

*To all whom it may concern:*

Be it known that we, HIRAM WALTERS and NATHAN BUMPUS, citizens of the United States, and residents of Curtice, in the county of Ottawa and State of Ohio, have invented a certain new and useful Excavating-Machine; and we 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.

Our invention relates to ditching or trench excavating machines of the type employing a rotary excavating wheel and adapted for the digging of either open ditches or those for receiving drainage tile or the like.

The object of our invention is to improve upon the bucket construction of the excavator wheels to facilitate a cleaning of the same, and also to provide simple and efficient means for coacting with the buckets to thoroughly clean the same of contained matter at a predetermined point in each rotation of the wheel whereby to enhance the practicability and commercial value of machines of this class.

The invention is fully described in the following specification, and while the same in its broader aspect 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 the portion of a machine embodying our invention with portions broken away. Fig. 2 is a cross-section of the same on the line  $x x$  in Fig. 1. Fig. 3 is an enlarged side view of a portion of the rim of the excavating wheel, and Fig. 4 is an enlarged cross-section of such rim portion taken on a line  $y y$  in Fig. 1.

Referring to the drawings, 1 and 2 designate parts of the frame work of a machine with which the excavating wheel comprising the features of our invention is associated, and 3 one of the supporting wheels of such frame. The excavating wheel is shown as comprising the laterally spaced ring members 4, 4 to which the edges of the excavating buckets 5 are secured as indicated. A cutter 6 of the same transverse shape as the buckets 5 also connects the two members 4 in advance of each bucket to form the cutting nose therefor.

6' designates cutting fingers which project outwardly in radial directions from each member 4 between the buckets and are preferably bowed outwardly beyond the side lines of the buckets to effect a trimming of the side walls of the trench being dug.

The rings 4, 4 are provided adjacent their inner edges at the outer sides thereof with annular sets of internal gear teeth 7 with which the pinions 8, carried in registering position by a drive-shaft 9, mesh. This shaft is journaled in suitable bearings 10 carried by the frame part 2 adjacent one side portion of the wheel and is driven in any suitable manner. Three idler-rolls 11 are associated with each side of the wheel in radial register with the gear teeth 7 against the inner sides of which they bear and are arranged in rectangular relation with the associated pinion 8 to cooperate therewith to carry the wheel for rotary movements, as is apparent by reference to the drawings. The upper rolls 11, or those horizontally opposed to the pinions 8, are carried by a shaft 12, mounted in bearings 13 on the frame parts 2, while the lower rolls 11 are mounted on shafts 14 carried by the pendent bearing parts 15 which are secured to the underside of the frame part 2.

One of the features of our invention consists in closing the rear ends of the buckets with hinged gates or end parts 16, which are hinged to the outer end edges of the buckets, as at 17, and are extended inwardly to adjacent the inner edges of the ring members 4, as shown. These gates have fingers 18 projecting from their pivoted ends rearwardly from the ends of the associated buckets and adapted to coact with a segmental plate or band 19 at the rear of the wheel to positively maintain the gates closed during the descending movements of the buckets, and with a similar plate or band 20 at the front of the wheel to retain the gates closed on the ascending movements of the buckets, such plates being arranged in contiguous position to the periphery of the wheel and concentric thereto. During the upward excavating movements of the buckets through the earth the fingers 18 act on the earth to retain the gates closed. The rear plate 19 is shown as being carried by the frame part 21 carried by the part 2, while the front plate is secured to the frame parts 1 and 2 and braced at its upper end by rods 22 extending upwardly from the part 2. An

open space is provided between the upper ends of the plates 19 and 20 to permit an opening of the gates 16 to facilitate a dumping and cleaning of the buckets. The contents of the buckets when discharged therefrom drops upon a subjacent endless conveyor apron 23, which is actuated in any suitable manner to deliver the dirt and other excavated matter to one side of the trench. To prevent an inward dropping of the diggings from the buckets between the rings 4 while ascending to discharging position, a segmental plate 24 is secured to the frame work within the wheel in close relation to the forward portion thereof to close the opening at such point between the inner edges of the rings 4.

A cleaning of each bucket is effected at the dumping point by a cleaner-spoon or blade 25, which is carried at the upper end of a rod 26 and projects upwardly between the rings 4 and within the buckets as they pass thereover, being of suitable width and shape to transversely fill the same. The spoon 25 inclines or curves forwardly to adapt its nose or outer end to cut through the contents of a bucket in sliding contact with the outer portion of the bucket. The rod 26 which carries the spoon 25 extends downwardly between the frame parts disposed on opposite sides of the excavating wheel, being pivoted between the frame parts 2, 2 as at 27, and having its lower end, which projects below such pivot, attached to a contraction-spring 28, which is anchored to the bearing part 15. The spring 28 acts on the rod 26 to retain the nose of the spoon 25 in yielding contact with the outer portions of the buckets as the spoon passes therethrough. The outward movement of the spoon is limited by the coaction of the rod 26 with a set-screw 29 to prevent the nose of the spoon from striking the forward edges of the cutting noses 6 of the buckets when entering the buckets.

On the passing of a bucket over the conveyor 23 its gate 16 is partially opened due to the lower or inner edge thereof striking a trip finger 30, which rises from the upper end of the plate 24 in the path of movement of the inner portions of the bucket gate, and the gate is then opened to its full extent by contact with the spoon end. The finger 30 is of knife-like form to adapt it to cut through and not obstruct the passage of the matter contained in the buckets.

It is thus apparent that we have provided

simple, efficient and inexpensive means for dumping the contents of the buckets of an excavator wheel and cleaning such buckets of adherent matter, and simple means for maintaining the bucket gates closed except during the dumping operation.

We wish it understood that our 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 our invention, what we claim as new and desire to secure by Letters Patent, is,—

1. In an excavating machine, the combination with a rotary excavating wheel having a series of inwardly opening peripherally arranged buckets, of a gate hinged to the rear end of each bucket at its outer edge and adapted to have its opening and closing movements in the plane of rotation of the wheel, a wing projecting at an angle from the hinged end of each gate and adapted to project substantially radially from the wheel when the attached gate is open and to project rearwardly from the associated bucket in substantially the arc of movement of its outer peripheral edge when the gate is closed, and means encircling portions of the wheel and cooperating with the bottom of a trench being dug to act on each gate wing to prevent an opening thereof except at a predetermined point in its revolution.

2. In an excavating machine, the combination with a rotary excavating wheel having a series of inwardly opening peripherally arranged buckets, of a gate hinged to the outer rear edge of each bucket and having its opening movements in the plane of rotation of the wheel, a wing projecting rearwardly from the hinged end of each gate when in closed position, and members encircling the forward and rear peripheral portions of the wheel and cooperating with the bottom of a trench being dug to act on each of said wings to retain their respective gates closed except when at a predetermined point in a revolution thereof.

In testimony whereof we have hereunto signed our names to this specification in the presence of two subscribing witnesses.

HIRAM WALTERS.  
NATHAN BUMPUS.

Witnesses:

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N. C. MILLER.