Sept. 19, 1933. V. S. PENOTE 1,927,323

EXCAVATOR BUCKET

Filed May 16, 1932 2 Sheets-Sheet 1

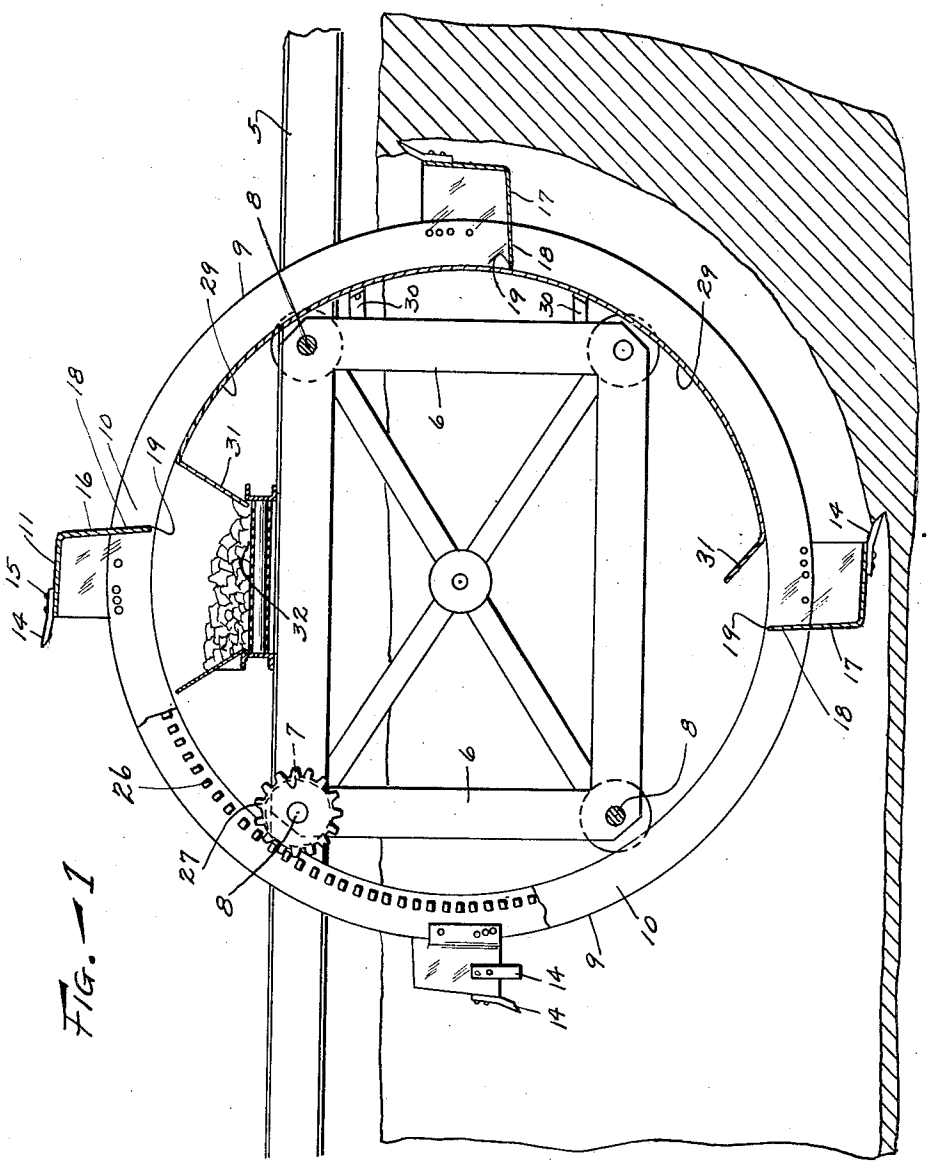


FIG. 1

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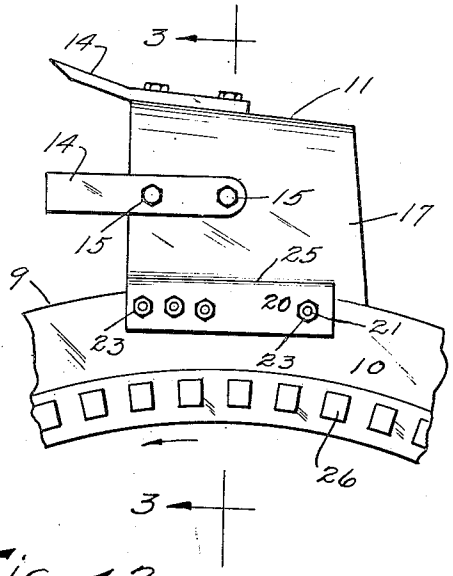


FIG. 2

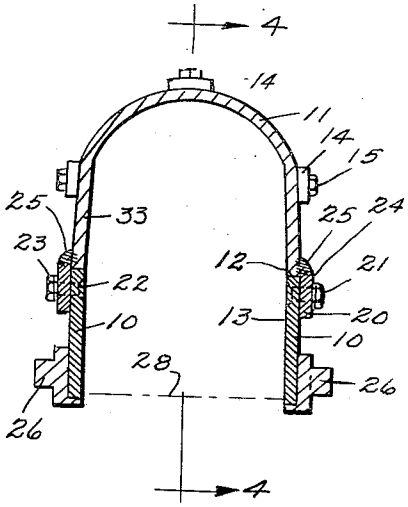


FIG. 3

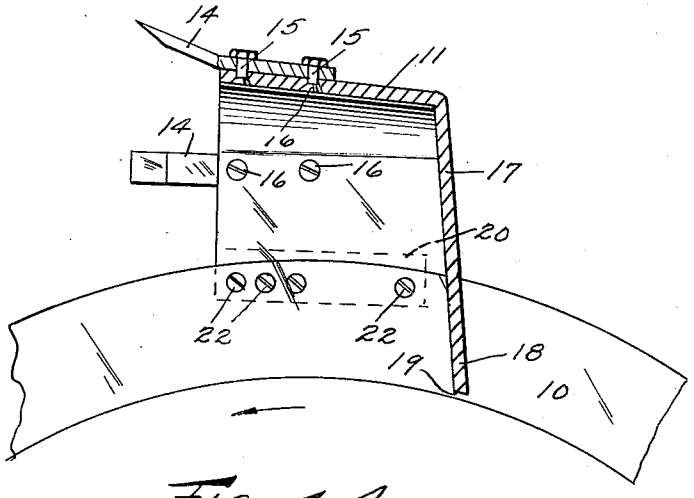


FIG. 4

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1,927,323

UNITED STATES PATENT OFFICE

1,927,323

EXCAVATOR BUCKET

Vincent S. Penote, Euclid, Ohio

Application May 16, 1932. Serial No. 611,618

9 Claims. (Cl. 37—94)

My invention relates to excavator buckets, and especially to excavating wheels for use in digging ditches or trenches, and one object of my invention is to provide an improved excavating wheel having spaced parallel rim members and to provide improved excavator buckets with means for mounting the latter upon such laterally spaced wheel rims, in a manner to provide a smooth inner surface within the walls of said buckets and on the inner surfaces of said rims.

Since the peripheral rims of the conventional excavator wheel are laterally spaced thereby providing a curved trough shaped structure about the wheel to receive therein excavated material, it has heretofore been considered expedient to mount buckets upon these wheel rims by securing the lateral edges of the bucket units upon the outer surface of such rims by bolting the parts together.

This mounting of the several buckets upon the wheel rims results in the provision of elongated shoulders or ridges within the buckets by these offsets at the upper edge of the wheel rims, which thereby forms an undesirable roughened inner surface on either side of each bucket, which tends to build up ridges of the excavated material within the buckets as the digging operation of the wheel continues, and the continued rotation of the wheel with its buckets tends to further build up the excavated material within the buckets to so great an extent that the contents of the several buckets is apt to adhere to the bottom and sides of the buckets so closely that a great disadvantage has arisen thus far in the failure to fully empty each bucket unit even when it is operated in a wholly inverted position.

Another object of my invention is to so construct this wheel and the buckets mounted on the said parallel rims to provide no roughened surfaces within the buckets or rims or at the point of attachment of the buckets upon such rims, so that the said smooth surfaces will tend to assist the removal of the excavated material from the buckets when the latter are in a position whereby gravity will normally tend to loosen such material from the buckets as they travel over a suitable conveyor for carrying the material laterally to a suitable point of delivery.

These inner ridges or shoulders within the buckets have heretofore presented a very serious difficulty especially when operating in wet or clayey ground, and my invention is designed to overcome this difficulty and provide an efficient excavating wheel and buckets which shall be durable and cheap, and which may be attached to the usual machine of this class already in use.

This invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of an excavating wheel with excavator buckets mounted thereon, parts being broken away;

Figure 2 is a fragmentary view showing a portion of the wheel in elevation;

Figure 3 is a transverse section through a bucket mounted on the rims of an excavator wheel, the section being taken on the line 3—3 of Fig. 2; and

Figure 4 is a central vertical section of an excavating bucket and showing a portion of the wheel in elevation, the section being taken in the plane indicated by the line 4—4 of Fig. 3.

My excavator buckets are mounted on excavators of the wheel type which include a frame having side bars 5 arranged in parallelism and which may support hanger frames 6, there being a pair of said bars each supporting a frame 6. Supporting rollers 7 are carried by the hanger frames 6, the rollers being mounted on a shaft 8 and one or more of the rollers being provided with sprocket teeth so that rotary movement may be transmitted to the wheel 9 as will be hereinafter explained. The manner of mounting the supporting bars 5 on the main frame of a machine is not disclosed in this specification, and is not regarded as particularly material to the present invention.

The excavating wheel 9 is mounted between the bars 5 and is provided with side rings 10 which are mounted in spaced and parallel relation on the periphery of the wheel 9, and thereby provide an annular cavity about the body of the wheel, the walls of the cavity serving in conjunction with the buckets as container mechanism for the excavated material.

This mounting of the several buckets upon the wheel rims by having the side portions of the buckets mounted in overlapping relation to the side rings and secured thereto by bolts, has been found most undesirable in the past, and my improved bucket 11 will now be mounted upon the side rings 10 in edge to edge relation of sides 33 of the bucket and such rings, as shown very clearly in Fig. 3 of the drawings in which such meeting edges at 12 will thereby provide continuous and smooth inner surfaces 13, which will be substantially in planes common to the rings and the sides 33 of the bucket, as indicated in such view.

These buckets 11 may be provided with the conventional cutting teeth 14 which may be secured

to the outer face of the bucket by suitable securing means such as the bolts 15 which will preferably have their heads 16 sunk in the wall of the bucket to present a smooth surface on the interior at this point as well as at the point of attachment with the wheel rims. These teeth will have their end portions extending beyond the end of the bucket and will cut into the ground as the wheel rotates, so that the dirt cut loose by the teeth will fall into the buckets. The rear end wall 17 will be integral with the sides of the bucket 11, and will extend inwardly between the rings 10 in close fitting engagement therewith, at 18, to the point 19 substantially even with the inner edges of the rings.

Means for securing the buckets upon the wheel rings 10 will include an elongated plate or bar 20 applied on either side of the buckets and on the outer side of the meeting edges 12, as shown clearly in Figs. 2 and 3. Two of these plates 20 will be provided for each bucket, and a plurality of attaching bolts 21 will be provided having their heads 22 sunk in the inner surfaces of the rings 10, the nuts 23 being detachably mounted outside the plates. The upper edges 24 of the plates or bars 20 will extend above the edges 12.

These outside bars 20, by overlapping the edges 12, are very effective in resisting outward tendency of the bucket side walls to spread, and thereby these bars hold the said side walls in proper position at said edges. As a further provision for security of attachment of the parts, the said upper edges 24 may be secured to the inner edges of said side walls of the bucket by welding the outer surfaces of said side walls to the edges 24, at 25, making a very rigid attachment of the buckets to the rings 10. By this improved construction hereby disclosed, the inner surfaces of the buckets, as well as of the rings 10, will present no shoulders of overlapping parts, but will have smooth surfaces not tending to retain material carried by the buckets and rims by adherence to said surface.

The excavating wheel 9 is actuated by a suitable sprocket gear carried by the roller 7 mounted on a shaft 8, the inner edges of the rings 10 being provided with suitable teeth 26 directed outwardly and spaced to mesh with the said sprocket gear 27. The said gear will be driven from a suitable power source whose exact structure is not especially material to this invention. A bottom for the channel or chamber 28 between the rings 10, is provided by an arcuate strip 29 which is suitably supported from a portion of the frame, as from the hanger frames 6 shown clearly in Fig. 1 of the drawings. The strip 29 is braced by suitable bars 30 connecting the strip with the hanger frame.

A plate 31 is secured at the upper end of the bottom strip 29, and constitutes a chute which extends downwardly over an endless conveyor 32 mounted to extend through the wheel 9 and is adapted to receive dirt from the buckets 11 and carry the material to a suitable point of delivery, and a similar plate 31 is secured at the lower end of said strip.

Viewing the structure as shown in Fig. 1, and assuming that the excavating wheel with its buckets to be rotating in a counter-clockwise direction, while the strip 29 and the conveyor 32 remain stationary, the dirt removed from the trench will fall successively into the buckets 11 and upon the strip 29, on the right hand side of the wheel, as the end walls 17 of the buckets rise to a point above the conveyor. At the latter point, each bucket is inverted and its contents fall upon the conveyor 32 which transports the material to a point of delivery at one side of the machine, the plate 31 assisting in directing the falling material upon the conveyor.

The construction I have here disclosed has been found very effective in forcibly removing the contents of the channel between the rings 10 and outside of the strip 29, but provides a scoop of the usual size which has great rigidity, though it has detachable parts, but most important of all; it has a smooth curved surface on the bottom and sides of each scoop, thereby presenting the much-desired smooth surface from which the bucket contents may readily be removed, and to which gravity does not cause excavated material to adhere with that great tenacity that has long been characteristic of the excavating buckets which heretofore have been mounted by bolting together overlapping plates which inevitably result in uneven edges on their inner surfaces upon which the material becomes packed and is difficult to remove.

My improved excavator buckets are shown in the drawings as mounted in spaced relation peripherally on an excavating wheel 9, such wheel being mounted upon the bars 5 by suspension from shafts 8 with rollers 7 provided on said shafts to give free driving of the wheel. It is to be understood that means may be applied to the frame bars 5 to raise or lower the wheel carried thereby, but such means is not shown here.

While it is my purpose to mount each bucket 11 with its side walls 33 resting edge to edge upon the spaced rings 10 of the wheel 9, it will ordinarily be found advisable to use a bucket having its side walls 33 slightly out of parallel, each side 33 making an angle with its ring 10 slightly less than 180 degrees at the meeting edges 12, as shown in Fig. 3.

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

1. In an excavator, an excavating wheel including spaced annular rings, buckets connecting said rings and mounted edge to edge with the latter to thereby provide a continuous and smooth inner surface within each bucket and ring on either side, and an elongated bar applied on the outer side of the meeting edges of each ring and bucket and having means for securing the bar to said ring.

2. In an excavator, an excavating wheel including laterally spaced annular rings, buckets connecting said rings and mounted edge to edge with the latter to thereby provide a continuous and smooth inner surface within each bucket and ring on either side, an elongated bar applied on the outer side of the meeting edges of each ring and bucket, means for securing each bar to its adjacent annular ring, and a weld for uniting the outer edge of each bar to the outer surface of the bucket.

3. In an excavator, an excavating wheel including laterally spaced annular rings, open buckets connecting said rings and mounted edge to edge upon the latter to provide a continuous and smooth inner surface within each bucket and ring on either side, an integral bottom plate extending radially inward from each bucket between the said spaced rings, and an elongated bar applied on the outer side of the meeting edges of each ring and bucket and having means for securing the bar to said ring and resisting outward spreading movement of the side walls of each bucket.

4. In an excavating device a rotatable wheel including laterally spaced side rings, open ended buckets carried by said side rings, the side walls of the buckets being mounted edge to edge upon said rings in substantially common planes therewith, a stationary bottom strip extending adjacent the inner peripheries of said side rings for a portion of the circumference of the wheel, an integral bottom plate extending inward from each bucket between the said rings to a position approximating the inner surface of said stationary strip, and elongated bars applied to the outer sides of the said side rings and covering the said meeting edges of each bucket and rings, means for securing each bar to its adjacent side ring, and a weld for uniting the outer edge of each bar to the outer surface of the bucket.

5. In an excavator, an excavating wheel including laterally spaced annular rings, buckets mounted upon and connecting said rings, the side walls of the buckets being mounted edge to edge with said rings to thereby provide a continuous and smooth inner surface within each bucket and ring on either side, an elongated bar applied in overlapping relation on the outer surface of each ring and bucket over the meeting edges thereof, means for securing each bar to its adjacent annular ring comprising threaded bolts having their heads sunk in the inner surface of the rings and their nuts attached outside the said meeting edges of the rings and buckets and external of said elongated bars, and a weld for securing together the outer surface of the bar to the outer surface of the bucket.

6. In an excavator, an excavating wheel including laterally spaced annular rings, circumferentially spaced buckets mounted edge to edge upon said rings, the bucket side walls forming obtuse angles with the rings, means connected with the side walls of each bucket and their corresponding wheel rings for holding the latter in suitable spaced relation, said connecting means comprising overlapping bars applied outside the buckets and rings and covering their meeting edges, means for securing each of said bars to their respective rings, and means for securing the outer edges of said bars to the outer surfaces of said buckets.

7. In an excavator, an excavating wheel including annular rings spaced in parallelism, buckets connecting said rings and having their side walls mounted edge to edge with and at obtuse angles with said rings to thereby provide a continuous and smooth inner surface within each bucket and ring on either side, and elongated bars applied on the outer sides of the said annular rings and covering the said meeting edges of each bucket and ring, means for securing each bar to its adjacent side ring and a weld for securing the outer edge of each bar to the outer surface of each bucket.

8. In an excavator, an excavating wheel including laterally spaced annular rings, circumferentially spaced buckets mounted edge to edge upon said rings and having means for connection with said rings to hold the latter in suitable spaced relation, said connecting means comprising overlapping bars applied outside the buckets and rings and covering their meeting edges, means for securing each of said bars to their respective rings, and means for securing the outer edges of said bars to the outer surfaces of said buckets.

9. In an excavator, an excavating wheel including spaced annular rings, buckets connecting said rings and mounted edge to edge with the latter to thereby provide a continuous and smooth inner surface within each bucket and ring on either side, and elongated bars applied on the outer side of the said annular rings and covering the said meeting edges of each bucket and rings, means for securing each bar to its adjacent side ring and a weld for securing the outer edge of each bar to the outer surface of each bucket.

VINCENT S. PENOTE.

DISCLAIMER

1,927,323.—*Vincent S. Penote*, Euclid, Ohio. EXCAVATOR BUCKET. Patent dated September 19, 1933. Disclaimer filed November 2, 1942, by the assignee, *The Cleveland Trencher Company*.

Hereby enters a disclaimer of claims 1, 2, 3, 4, 5, 8, and 9.

[*Official Gazette December 8, 1942.*]