R. Y. KESSLER.

DITCHING MACHINE.

APPLICATION FILED MAY 20, 1911.

1,039,412.

Patented Sept. 24, 1912

3 SHEETS—SHEET 1.

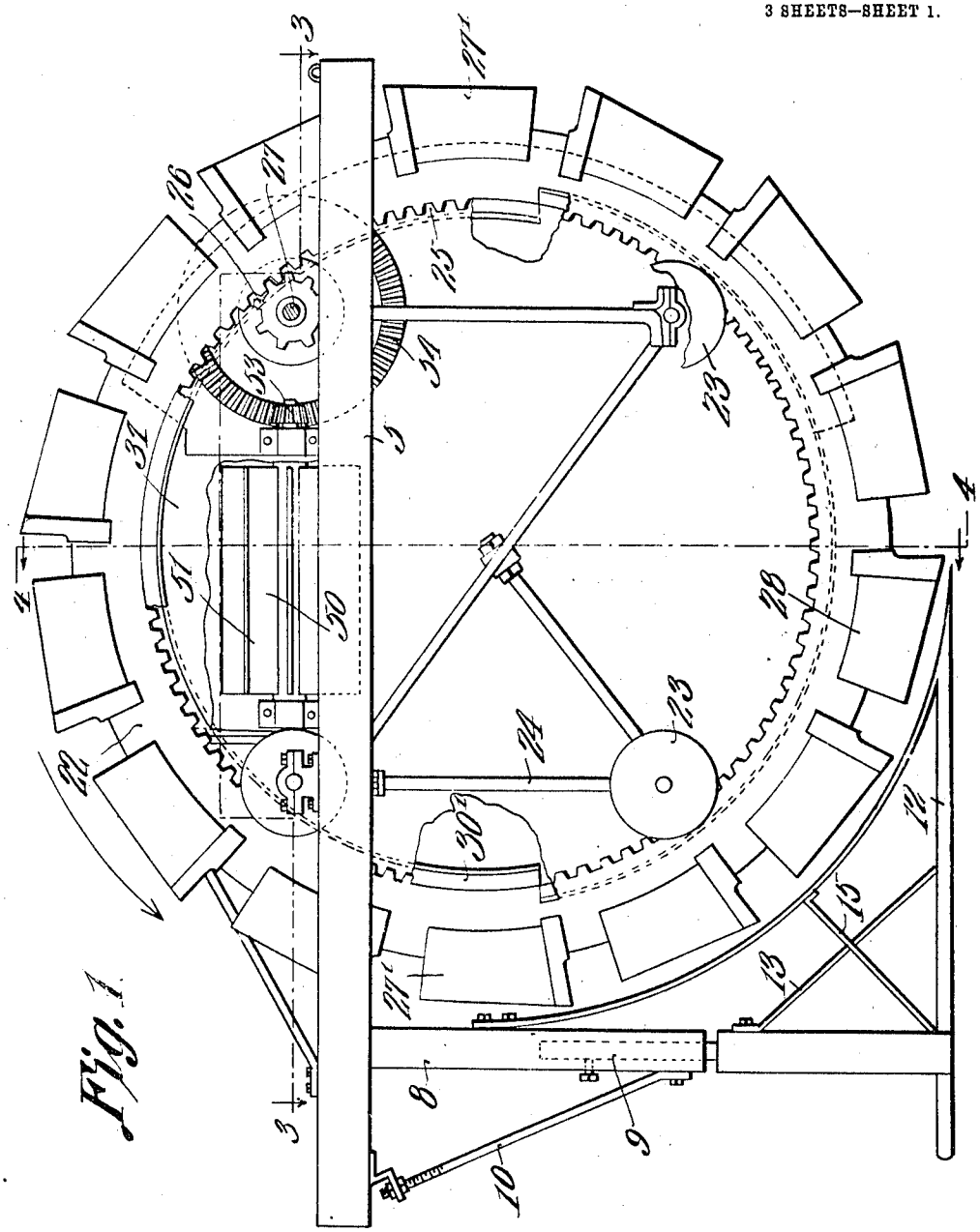

Fig. 1.

Witnesses

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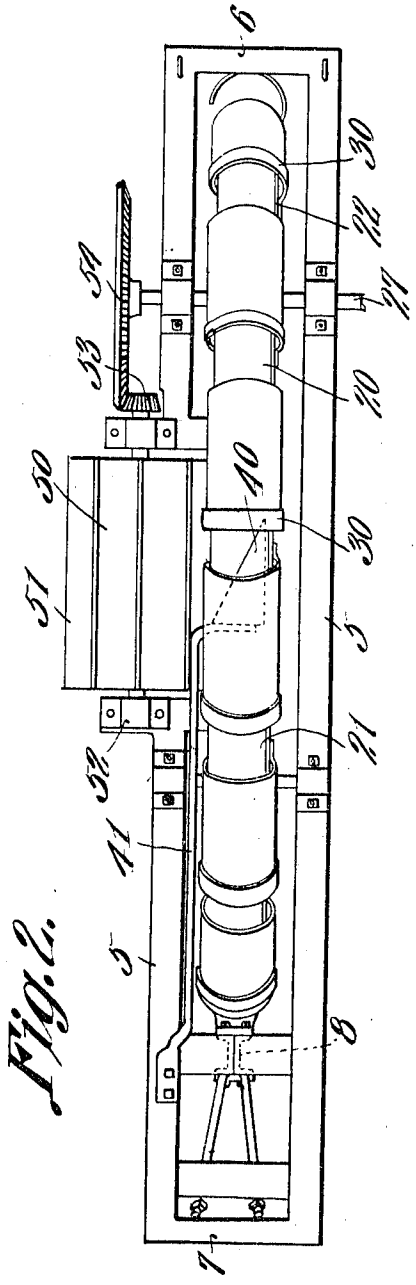

Fig. 2.

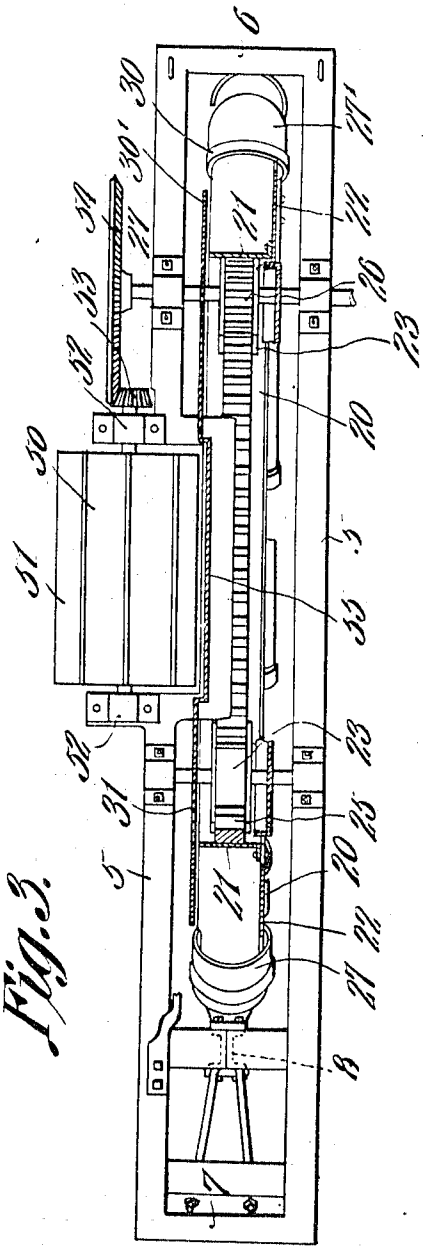

Fig. 3.

Witnesses

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3 SHEETS—SHEET 3.

Fig. 4.

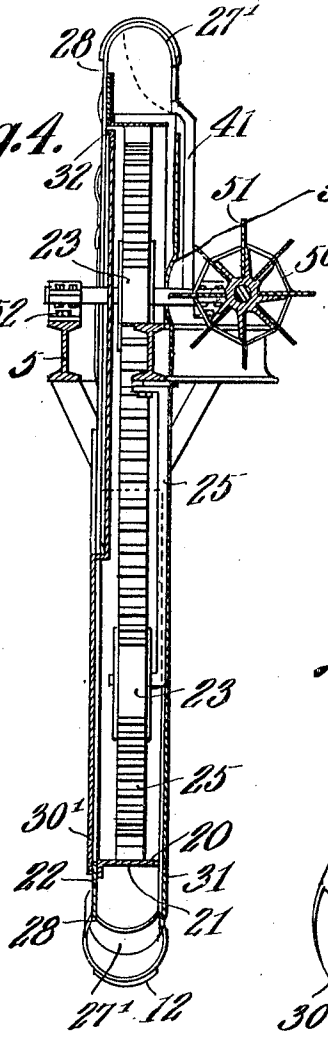


Fig. 5.

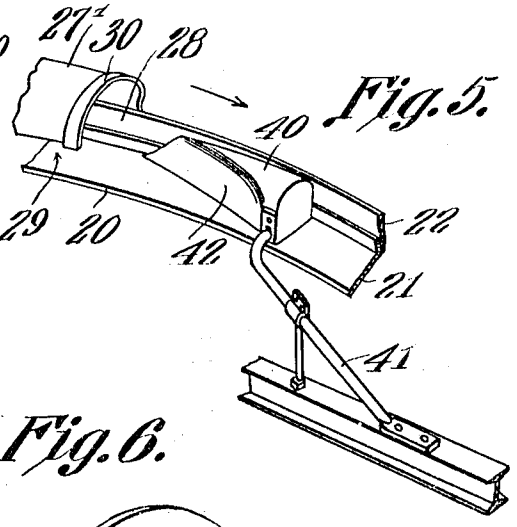


Fig. 6.

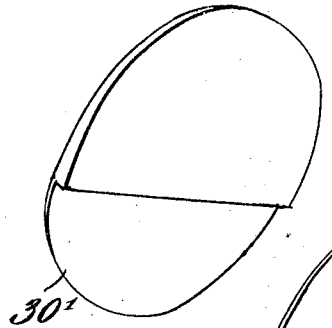
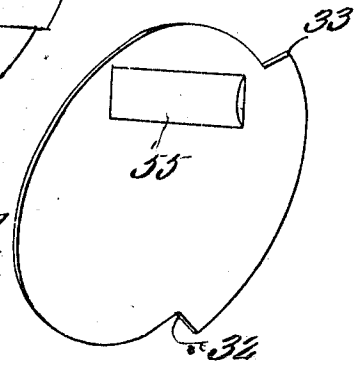


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

RICHARD YATES KESSLER, OF MORRISONVILLE, ILLINOIS.

DITCHING-MACHINE.

1,039,412. Specification of Letters Patent. Patented Sept. 24, 1912.

Application filed May 20, 1911. Serial No. 628,404.

To all whom it may concern:

Be it known that I, RICHARD Y. KESSLER, a citizen of the United States, residing at Morrisonville, in the county of Christian and State of Illinois, have invented a new and useful Ditching-Machine, of which the following is a specification.

This invention relates to excavating, and more especially to the machines for doing this work which include a wheel having buckets around its periphery; and the object of the same is to produce an improved ditching machine which is intended to be drawn and its wheel rotated by a slow-moving traction engine and which will avoid many of the objections hitherto existing in machines of this kind.

To this end the invention consists in the details of construction hereinafter more fully described and claimed, and as set forth in the drawings wherein—

Figure 1 is a right side elevation of this machine complete, with the adjacent face plate removed, but shown in dotted lines. Fig. 2 is a plan view with the face plates of the casing omitted. Fig. 3 is a horizontal section on the line 3—3 of Fig. 1, showing the face plates in section. Fig. 4 is a vertical section on the line 4—4 of Fig. 1, again showing the face plates in section. Fig. 5 is a perspective detail of the scraper or ejecting mechanism, showing also a fragment of the main wheel or ring and one of the buckets. Figs. 6 and 7 are perspective details of the face plates of the casing detached.

In the drawings the numerals 5 refer to the side bars of the main frame which is preferably rectangular as best seen in Fig. 2, and these bars are connected across their front and rear extremities by short bars or beams 6 and 7 to the former of which the traction engine is connected in a manner which will not be necessary to illustrate or describe. Depending from the rear end of the framework is a standard 8 which may be made longitudinally and vertically adjustable as at 9 in any desired way, and braced as at 10, and the lower end of this standard carries a skid or runner 12 which itself may be braced as at 13; and the numeral 14 designates a shield curving around from the point of the runner 12 to the standard 8 and preferably braced as at 15, this shield being for a purpose to be described hereinafter. As customary with machines of this kind, the skid or runner 12 travels in the bottom of the ditch, and it therefore may be desirable on occasions to effect its adjustment as at 9 according to the depth of the ditch. It will be noted that the upper and lower parts 8, require but slight adjustment, the skid or runner being sufficiently flexible to permit of this adjustment. As above stated, the draft mechanism is attached to the front end of the device, whereas the runner or supporting mechanism is attached to the rear end thereof. A part of the framework is the face plates best seen in Figs. 6 and 7, but these will be described later.

The numeral 20 designates a large bull-wheel or ring which is preferably of L-iron comprising a flat rim 21 and a radially projecting flange 22 at one edge thereof as seen in Fig. 5, the flange in the present drawings being shown as at the right side of this machine; and 23 are rollers mounted on a skeleton framework 24 attached to the main framework, and through which this ring is supported by and permitted to rotate within the latter. My preferred means for driving this ring consists in providing it with an internal row of teeth 25 which engage a pinion 26 mounted on a power shaft 27' and driven from any suitable source not necessary to describe, excepting that the speed of rotation should be rather slow. Around the periphery of this ring are mounted buckets 27 each secured at one side as at 28 to the flange 22 and open at its other side as at 29 in Fig. 5, and the front edge of each bucket has a knife or cutter 30 which is here shown as curved although that is not essential to the successful operation of the machine. The buckets are spaced some little distance apart and their bodies preferably tapered slightly to the rear, although this is a matter of detail and depends considerably upon the nature of the earth being worked and the size and depth of the ditch being cut. In practical use the fastening means 28 will doubtless be rivets or something of a nature which will permit the buckets to be removed from the wheel or ring and others to be substituted so as to adjust the machine to different conditions. Coöperating with this wheel and its buckets are the face plates best seen in Figs. 6 and 7. The right hand face plate 30' it will be observed is nearly or substantially circular in contour, and is of a size to cover the open-

ing within the ring and extend at its edge under the flange 22 so as to prevent soil from getting into this side of the ring. The left hand face plate 31 is somewhat larger as seen, the enlargement being a radial extension which commences at the point 32 at the bottom and extends up around the front of the ring to the point 33 nearly at its top, thereby throughout this portion of the ring taking the place of the flange 22 which, as above stated, is omitted from this side of the rim 21 of the wheel or ring 20. It follows that when the latter is rotated in the direction of the arrow and simultaneously moved slowly forward, the buckets descend at the rear side of the wheel and take up earth at the bottom of the trench and from thence upward to the point where they leave the ground, their cutting edges 30 cutting into the soil and their bodies 27 accumulating it so that it cannot fall out at one side by reason of the presence of the flange 22 on the rim of the wheel and it cannot fall out at the other side by reason of the presence of the flange or extension 32 on the left hand face plate.

The action just above described removes the soil from the trench or ditch being formed, but when the buckets arrive at the top of the wheel 20 some means must be provided for emptying them. I therefore employ the ejector best seen in Fig. 5, and this consists of a scraper 40 of about the shape shown and so located as to travel upon the rim 21 of the wheel and against its flange 22, and a suitable bracket 41 supports this scraper from the framework. One side of the scraper is beveled as at 42, and as the filled buckets pass the scraper its beveled side forces their contents out of their open sides 29 in a manner which will be clear.

Coöperating with the ejector just above described I preferably employ any suitable form of conveyer for carrying off the soil excavated by the buckets and ejected from them by the scraper, and in the present illustration I have shown this conveyer as consisting of a baffle wheel 50 having blades 51 standing radial to its axis which latter is held in bearings 52 mounted on the main frame, and one end of the axis is provided with a pinion 53 which derives motion from a large gear wheel 54 mounted on the power shaft or from any other suitable source not necessary to amplify. The left hand casing may be inset as indicated at 55 so that the blades of this wheel may extend as far inward as possible, the obvious purpose being that it shall catch all dirt which is forced out of the uppermost bucket by the scraper 40.

The operation of this machine is as follows: The skid or runner 12 having been seated in the ditch (which it is assumed has either been partially dug or has been started by hand) and a traction engine connected to the front end 6 of the frame, and suitable connection having been made with the power shaft 25, the machinery is started and the ditcher is drawn slowly forward while the power shaft is simultaneously rotated in the proper direction. The buckets on the ring descend into the already opened trench or ditch and their cutting edges from the lowest point up to the surface scrape up the soil and accumulate it within their bodies. Both sides of the ring are closed by the face plates and its rear by the shield in a manner above described, and hence as the machine progresses through the earth the soil is kept out of the inside of the ring and cannot gain access to the gears or rollers, in addition to which the left hand face plate closes the open sides 29 of all buckets until they reach the top of the ring where the ejector is located. The latter dislodges the accumulated soil within each bucket in a manner above described, and it falls next onto the conveyer hence it is delivered to the proper point. It the conveyer be a baffle wheel as herein described, the soil falling onto it is simply tossed to one side of the ditch but sufficiently far away from the same so that it cannot fall into it, although it can be filled in later by hand after the workmen have put the pipes into the ditch or done whatever is desired thereto. Otherwise as heretofore stated, the details, proportions, and materials of parts are not essential to the successful operation of this machine.

What is claimed is:

1. In a ditching machine, the combination with an upright ring, buckets carried by its periphery and each open on one side, a main frame, means for pivotally supporting the ring therein, of two face plates carried by the frame, one of them lapping the ring on that side thereof where the buckets are closed and the other lapping the ring on the other side thereof and having a peripheral extension covering the open sides of the buckets from the lowest point of said ring to a point above the surface of the earth.

2. In a ditching machine, the combination with an upright ring, buckets carried by its periphery and each open on one side, a main frame, means for pivotally supporting the ring therein, of two face plates carried by the frame, one of them lapping the ring on that side thereof where the buckets are closed and the other lapping the ring on the other side thereof and having a peripheral extension covering the open sides of the buckets from the lowest point of said ring to a point above the surface of the earth, an ejector carried by the frame just in rear of the last-named point, a runner traveling in the ditch behind the ring, and a curved shield carried by said runner and its sup-

port and extending rearwardly from the lowest point of the ring around the periphery thereof.

3. In a ditching machine, the combination with an upright ring, buckets carried by its periphery and each open on one side, a main frame, of two face plates carried by the frame, one of them lapping the ring on that side thereof where the buckets are closed and the other lapping the ring on the other side thereof and having a peripheral extension covering the open sides of the buckets from the lowest point of said ring to a point above the surface of the earth, an ejector located just in rear of said last-named point and having a beveled side, the shape of the ejector being such as to scrape the material out of each bucket which passes over it, and a bracket mounted on the main frame for supporting said ejector and connected with it at a point over which the open side of each bucket passes.

4. In a ditching machine, the combination with an upright ring comprising a flat rim and a radial flange projecting from one edge thereof, a frame within which said ring is supported, means therein for rotating the ring, and face plates carried by the frame and lapping the ring, the plate on that side of the ring opposite its flange having a radial extension from the lowest point of the plate around its front to a point near its top; of substantially tubular buckets each having one side closed and connected with said flange and the other side open, and an ejector consisting of a triangular scraper resting upon the rim and against the flange of said ring just in rear of the last-named point and of a shape to eject the material from each bucket as the latter passes over the scraper, and a bracket connecting the scraper with the main frame and standing in position to permit the open side of each bucket to pass astride it.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

RICHARD YATES KESSLER.

Witnesses:
F. A. McKINNEY,
ALOYSIUS McLEAN.