

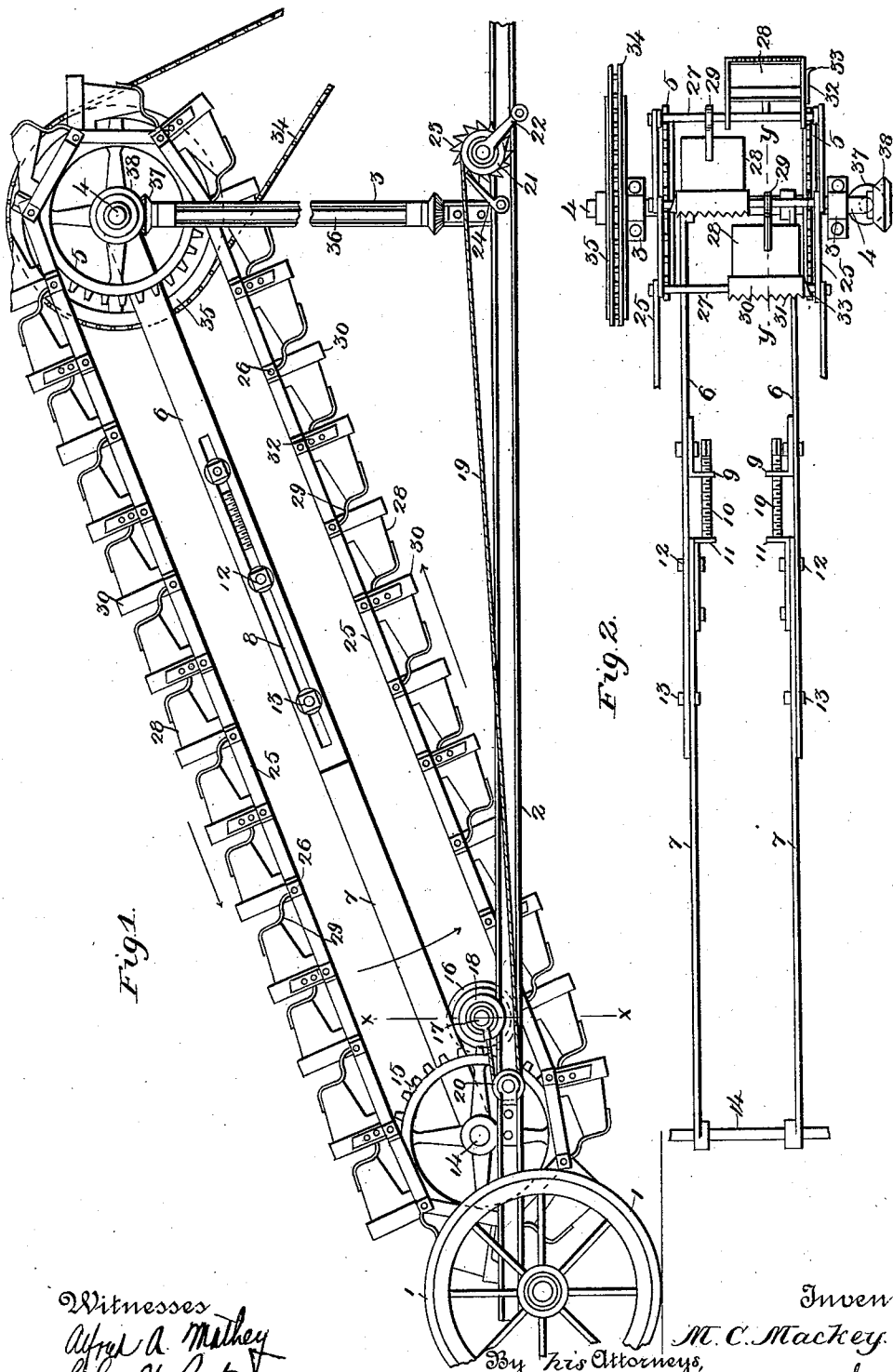
(No Model.)

2 Sheets—Sheet 1.

M. C. MACKEY.
DITCHING OR EXCAVATING MACHINE.

No. 569,975.

Patented Oct. 20, 1896.



Witnesses
Alfred A. Mathey
Chas. H. Gates

Inventor
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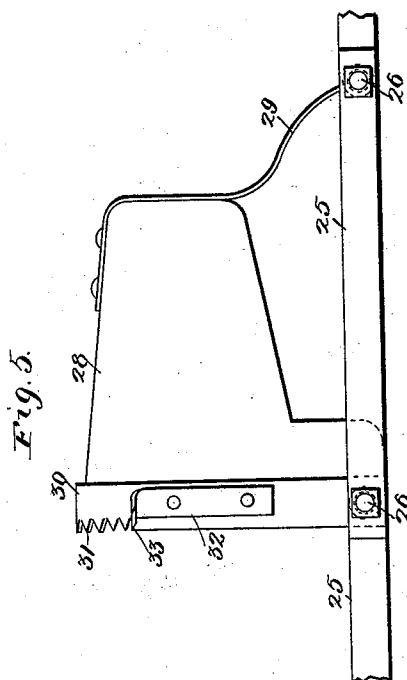
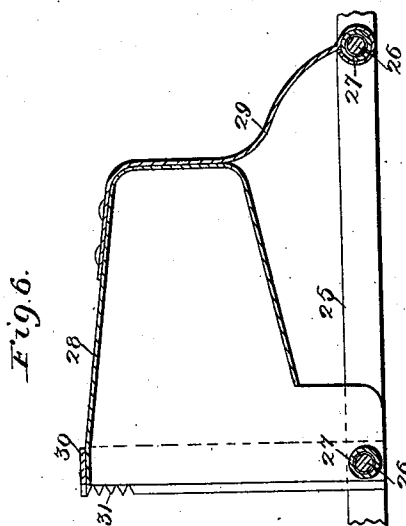
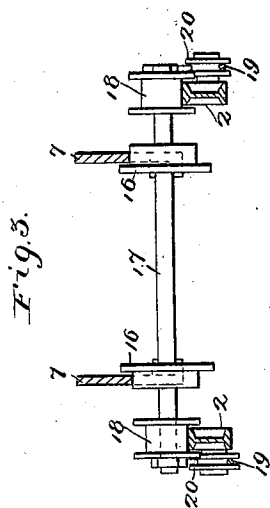
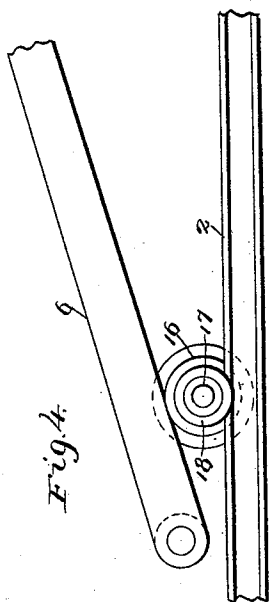
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UNITED STATES PATENT OFFICE.

MICHAEL C. MACKEY, OF ST. LOUIS, MISSOURI.

DITCHING OR EXCAVATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 569,975, dated October 20, 1896.

Application filed January 10, 1896. Serial No. 575,023. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL C. MACKEY, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Ditching or Excavating Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in ditching-machines; and it consists in the novel arrangement and combination of parts more fully set forth in the specification, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my invention. Fig. 2 is a top plan with certain portions removed. Fig. 3 is a section on line *xx* of Fig. 1. Fig. 4 is a detail in side elevation of Fig. 3. Fig. 5 is a side elevation of one of the buckets; and Fig. 6 is a section on line *yy* of Fig. 2, taken through the middle of the bucket.

The object of my invention is to construct a ditching-machine the excavating-buckets of which can be readily brought in contact with the ground to be operated on under the action of gravity and at will be disengaged from the ground when occasion arises to move the ditching-machine or excavator from one point to another.

It consists in special features of construction, which in detail can be described as follows:

Referring to the drawings, 1 represent the wheels of the truck, located at the free or advancing end of the excavator proper, said truck being adapted to support on each side of the center thereof the free ends of the rails 2, whose opposite ends are carried by and form a part of a traction-engine, (not shown,) by which engine the device is driven from one point to another over the ground to be excavated. Bolted to the rails 2 are standards 3, whose upper ends form the supports and bearings for a transverse driving-shaft 4, on either side of the center of which are disposed sprocket-wheels 5, by means of which the endless conveyer to be presently described is driven. Loosely and pivotally embracing the shaft 4 are the lateral members 6 of an extensible brace, forming the support for the buckets of the conveyer.

The length of the brace may be varied by the extensible bars 7, which are adjustable

along the members 6, the form of adjustment being as follows: Each member 6 is slotted at 8, and has secured at the upper end of the slot and along the inner surface thereof an angle-bar 9, through the short horizontal arm of which passes an adjusting-bolt 10, the bottom of each bolt bearing against a similar arm of an angle-bar 11, secured to and carried by the bars 7 by means of bolts 12 passing through the several parts and through the slot 8, the member 7 being further secured by bolts 13, passed through the bars 7 and slots 8 of the members 6. By first loosening the nuts of the several bolts 12 and 13 and turning the adjusting-bolts 9 in one direction or the other the length of the brace can thus be varied and, as subsequently seen, the tension of the driving-chain of the buckets of the conveyer adjusted. The free ends of the bars 7 loosely embrace a shaft 14, whose opposite ends carry the sprocket-wheels 15, over which the lower end of the endless conveyer is driven.

The lower end of the brace which supports the endless conveyer (that is, the lower ends of the bars 7) rests upon the flanges of the wheels 16, carried by a traveling transverse shaft 17, whose free ends are provided with rollers 18, adapted to travel over the rails 2. Each end of the shaft 17 is connected with one end of a cable 19, passing over an idle pulley 20, secured to the outside of each rail in proximity to the lower end of the conveyer, the cable 19 passing thence forward and adapted to wind upon a drum 21, operated by a crank-handle 22, each drum being provided with a ratchet-wheel 23, with which coöperates a pawl 24, which allows it to turn only in one direction. It is obvious that as the cables 19 are wound upon their respective drums 21 the traveling shaft 17 will be driven toward the lower end of the conveyer-supporting brace, raising the lower end of the latter out of contact with the ground. Upon disengaging the pawls 24 from their respective ratchet-wheels the weight of the conveyer-supporting brace bearing upon the wheels 16 will force the shaft 17 thereof to travel along the rails 2 in the reverse direction, (said brace bearing down on the shaft 17 in the direction shown by the curved arrow in Fig. 1,) thus permitting the lower end of the conveyer to touch the ground over which the buckets are to be operated.

The conveyer is constructed as follows: Connected by a series of longitudinal alternating links 25 are a series of transverse cylindrical rods 26, the whole forming a chain adapted to be engaged by the sprocket-wheels 5 5 and 15 15, respectively. Embracing each rod 26 and interposed between each opposite pair of links 25 is a sleeve or tube 27, over which tubes are passed and disposed alternately on either side of the central line of the conveyer a series of buckets 28, the center of the bottom of each bucket being reinforced by a brace 29, the brace of one bucket embracing the tube of the next succeeding rod of the series. (See Figs. 2 and 6.) The edge of the open end of each bucket is provided with a band 30, whose medial portion has teeth or serrations 31 for cutting into the earth as the buckets advance. Each band is, moreover, provided with plates 32, whose terminal laterally-deflected ends 33 form side cutters for each bucket.

The operation is as follows: After the tension of the chain carrying the buckets has been adjusted by the proper adjustment of the brace composed of the members 6 6 and bars 7 7 the lower end of the brace which, as before stated, always rests upon the wheels 16 of the traveling shaft 17 pushes said shaft along the rails 2 until the buckets at that end engage with or come in contact with the ground, the pawl 24 having been previously disengaged from the ratchet 23 to allow the cable 19 to unwind under the circumstances, and thus permit the conveyer to drop by gravity. Motion is then imparted from the traction-engine through the medium of the chain 34 to the sprocket 35, carried at one end of the shaft 4, upon the rotation of which the endless chain carrying the buckets is set in motion, the buckets traveling as indicated by the arrows in Fig. 1, scooping up the dirt and dumping it after each bucket has passed over the sprockets 5. The traction-engine through the rigid connection formed by the rails 2 pushes or advances the forward truck mounted on the wheels 1 over the surface of the ground in any desired direction. As the dirt is dumped it may be caught and conveyed to any suitable point by a belt or endless apron, (not shown,) which can be operated by any suitable mechanical connection coupled to a vertically-rotating shaft 36, driven by the bevel-pinion 37, meshing with a terminal pinion 38 at the opposite end of the shaft 4. When it is desired to discontinue the digging, the operator winds up the cable 19 over the drum 21 on each side of the machine, whereby the traveling shaft 17, with its wheels 16, raises the lower end of the gravity conveyer-brace, thereby raising the buckets out of contact with the ground.

Having described my invention, what I claim is—

1. In a ditching-machine, a suitable brace, a series of buckets forming a conveyer carried by said brace, means for pivotally secur-

ing one end of the brace whereby the opposite or free end will gravitate or drop into contact with the ground, a traveling shaft for temporarily retaining the free end above the ground, and suitable rails for said shaft, substantially as set forth.

2. In a ditching-machine, a suitable wheeled truck, rails extending from the same to a suitable traction-engine, standards located at a suitable distance from the truck, a drive-shaft mounted in suitable bearings on top of said standards and disposed transversely to the rails, an adjustable brace pivotally and loosely embracing said shaft, a shaft at the lower or free end of the brace, sprocket-wheels mounted on said shaft on either side of the brace, an endless conveyer supported and driven by said sprockets, a traveling transverse shaft coöperating with the brace for elevating or lowering the free end of the brace at will, and suitable supporting-rails for the transverse shaft, substantially as set forth.

3. In a ditching-machine, a suitable wheeled truck, tracks or rails extending from the same to a suitable traction-engine, a conveyer-brace pivotally mounted at one end over the rails, a transverse shaft having wheels for supporting the lower end of said brace, and having suitable rollers disposed on the rails, suitable cable connections carried by the traveling shaft, a drum over which the cable passes, whereby upon the winding of the cable or cables, the traveling shaft is drawn in one direction and raises the free end of the brace a suitable distance above the ground, and whereby upon release of the drum the weight of the free end of the brace will drive the supporting-shaft in the reverse direction and cause the free end of the brace to gravitate and come in contact with the ground, substantially as set forth.

4. In a ditching-machine, an endless chain comprising a series of alternately-disposed outer links, transverse cylindrical rods connecting the adjacent ends of each pair of links, a tube embracing each rod between the links, a bucket having an open end passed over each tube, and a brace carried by the bottom of each bucket embracing the tube of the next succeeding rod, the buckets being disposed in alternate series on either side of the central line of the chain, substantially as set forth.

5. In a ditching-machine, a bucket having an open end, a band embracing the bucket about the edge of the open end thereof, a series of teeth or serrations formed at the medial portion of the band, and a plate carried by each band on the outer face thereof and having a terminal laterally-deflected end forming a side cutter for each bucket, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

MICHAEL C. MACKEY.

Witnesses:

ALFRED A. MATHEY,
EMIL STAREK.