(No Model.)

4 Sheets—Sheet 1.

R. DALTON.

EXCAVATING MACHINE.

No. 520,916. Patented June 5, 1894.

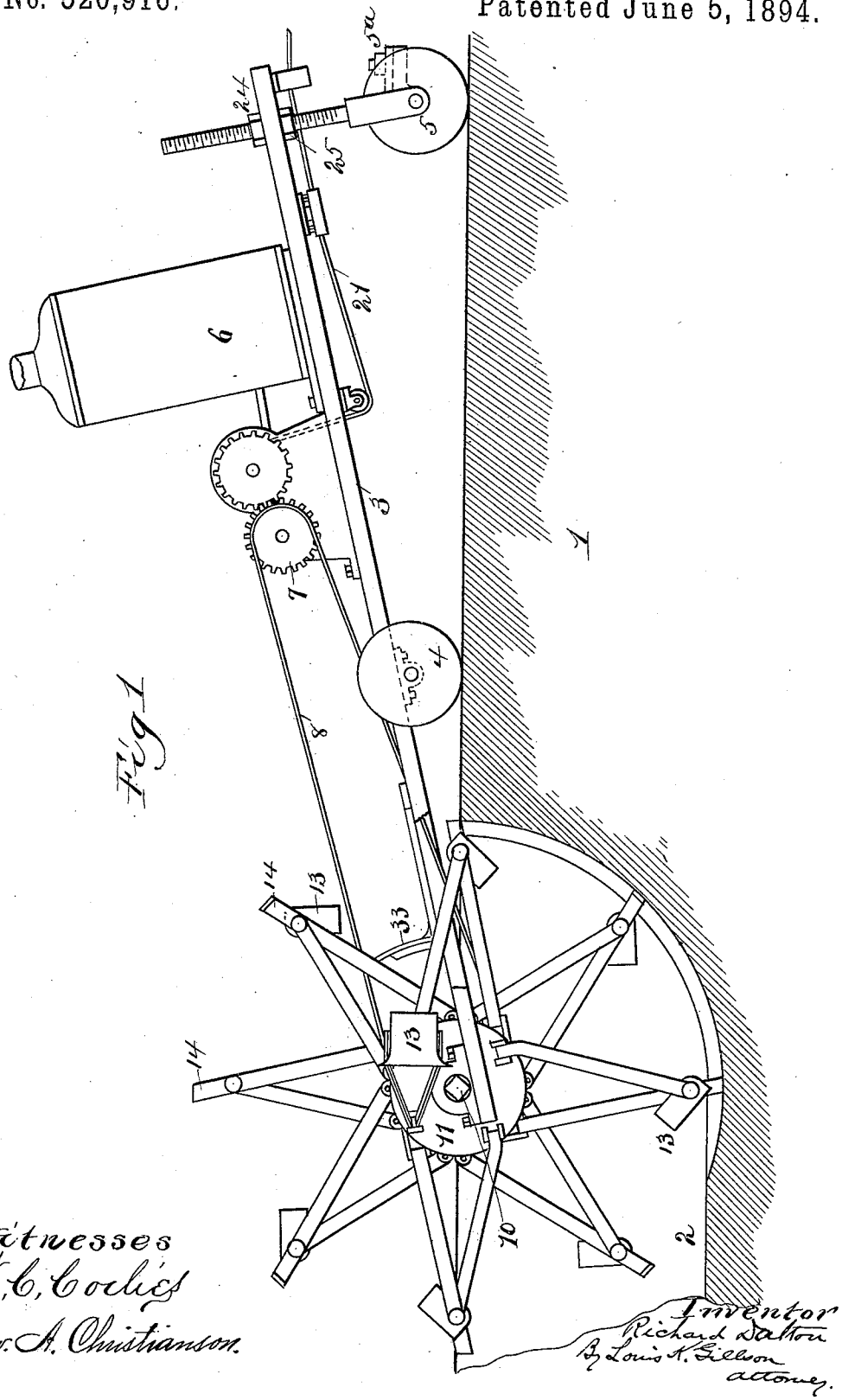

Fig 1

Witnesses
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Inventor
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WASHINGTON, D. C.

(No Model.)

4 Sheets—Sheet 2.

R. DALTON.

EXCAVATING MACHINE.

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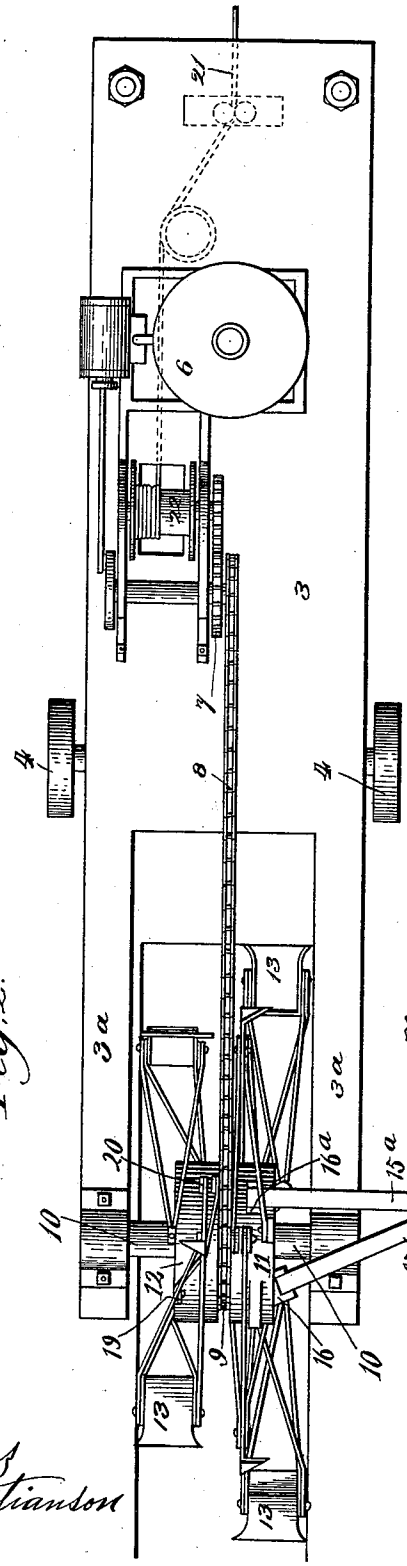

Fig. 2.

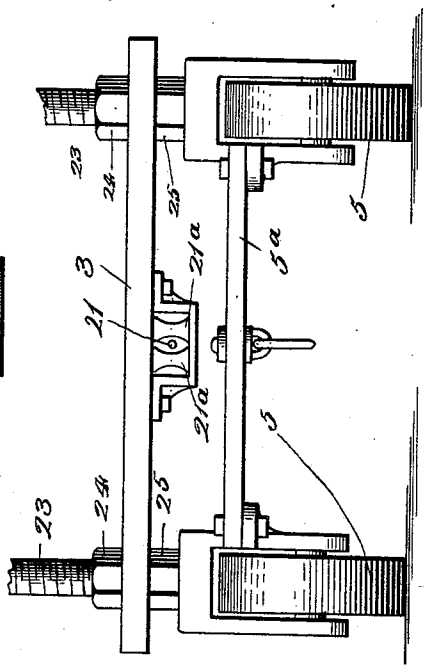

Fig. 3.

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(No Model.)

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R. DALTON.

EXCAVATING MACHINE.

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Fig 4

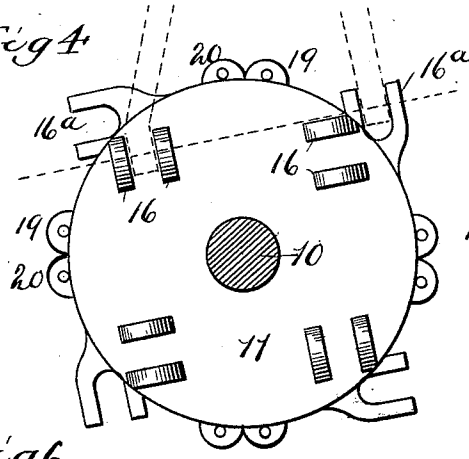


Fig 5

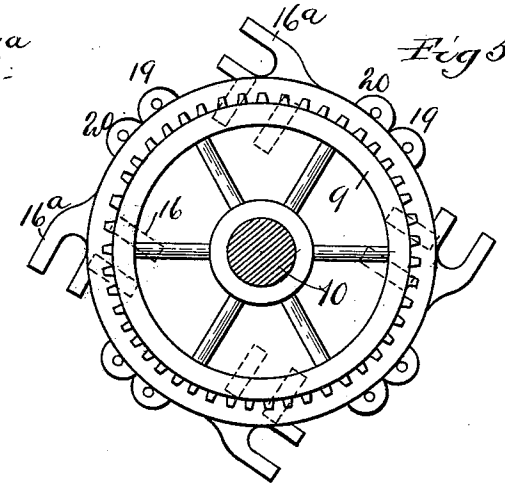
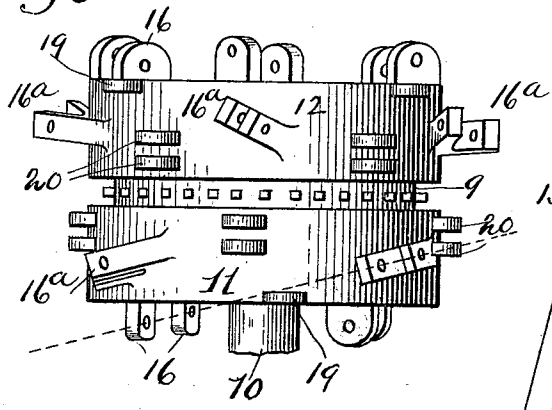


Fig 6



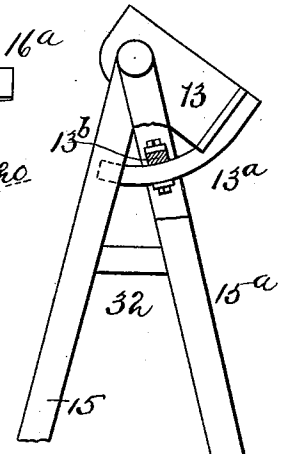


Fig 7

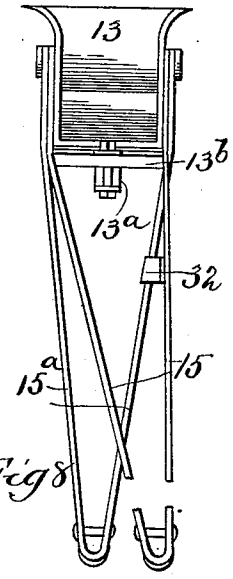


Fig 8

Fig 9

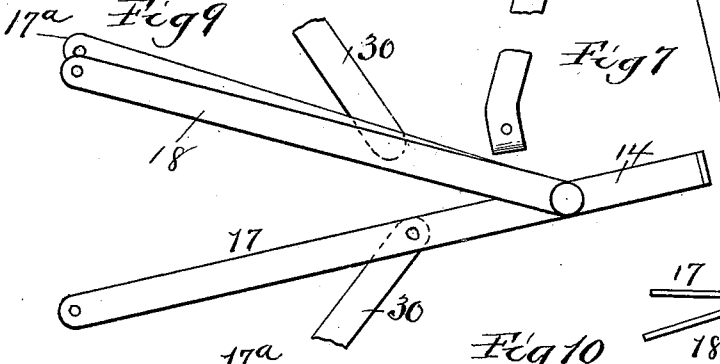
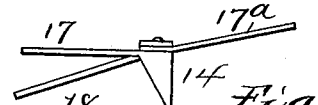


Fig 10

Fig 11



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(No Model.)

4 Sheets—Sheet 4.

R. DALTON.

EXCAVATING MACHINE.

No. 520,916. Patented June 5, 1894.

Fig. 12.

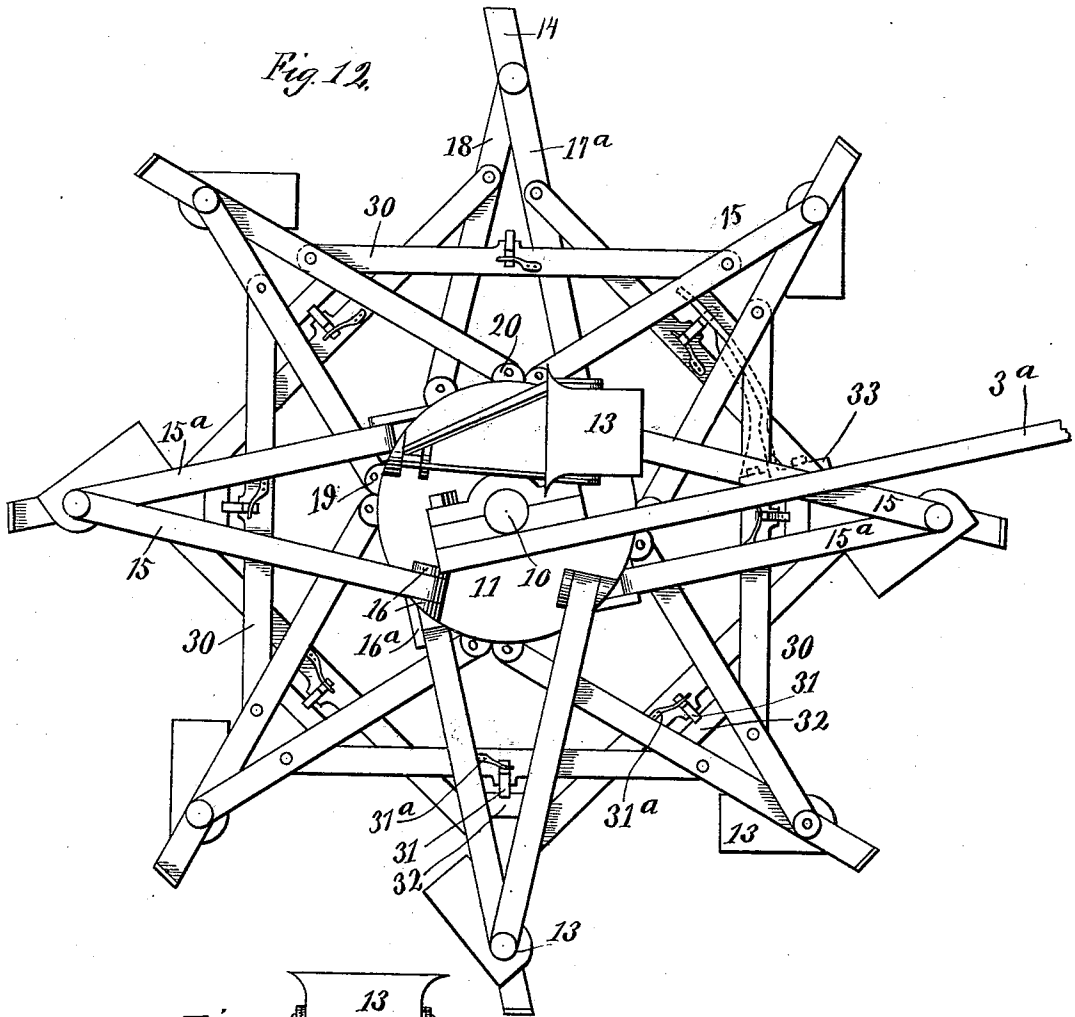


Fig. 13.

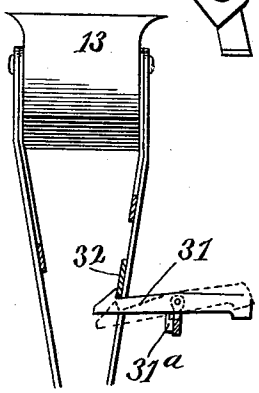
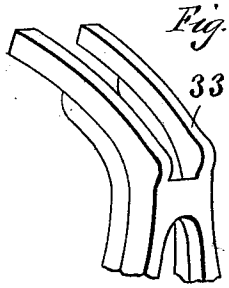


Fig. 14.



Witnesses:
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Jno. A. Christianson.

Inventor:
Richard Dalton
By Louis Wilson
Atty.

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UNITED STATES PATENT OFFICE.

RICHARD DALTON, OF WILMETTE, ILLINOIS.

EXCAVATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 520,916, dated June 5, 1894.

Application filed October 4, 1893. Serial No. 487,139. (No model.)

To all whom it may concern:

Be it known that I, RICHARD DALTON, a citizen of the United States, residing at Wilmette, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Excavating-Machines; and I do 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.

My invention relates to excavating machines, particularly for use in ditching. Its object is to provide means for excavating by steam, or other power, and particularly to provide a machine which will automatically dump its buckets.

The invention consists of the use of scoops or shovels carried by arms, so mounted upon a revolving shaft, that as they are elevated they fall away from the perpendicular plane within which they hang in excavating; together with such other minor features as are hereinafter mentioned.

In the accompanying drawings, Figure 1, is a side elevation of the machine while at work. Fig. 2, is a plan view of the machine. Fig. 3, is a front elevation of the forward truck for carrying the machine. Figs. 4 to 14, are details of various parts of the machine.

The machine as shown is adapted for ditching, though it could, obviously, be easily arranged for making excavations of any kind.

At 1, is shown a section of earth; at 2, the ditch or trench dug by the machine.

The carrying frame or platform is indicated at 3, and 4, 5, are trucks for carrying the frame.

A steam boiler and engine are shown at 6, a drive sprocket wheel at 7. A sprocket chain, 8, runs upon the wheel 7, and a wheel 9, is mounted upon a shaft 10, which is journaled in backwardly projecting arms, 3^a, of the frame 3 and carries the scoops. Upon each side of the sprocket wheel 9, is a wide hub 11, 12. These parts being exactly alike I will describe but one of them. Upon the side and near the face of the hub are fixed socket irons 16, and upon the face of the hub and near the sprocket wheel 9, are other socket irons 16^a. The number of each of these series of socket irons corresponds with the number of scoops to be carried by each hub.

The scoops 13, are supported upon the double arms 15, 15^a, pivotally attached, respectively to the socket irons 16, 16^a, the arms 15 being in advance. One arm of each pair extends to each side of the scoop, and both pairs are attached upon the same trunnions, upon the sides of the scoop. Above each scoop the arms upon opposite sides are united by a cross bar 13^b, and a curved arm 13^a, extends upwardly from the back of the scoop and is adjustably clamped to this cross bar. By this arrangement the scoop may be set at any desired pitch. The line of attachment of the arms of the scoops being oblique to the direction of their movement and the advance arm being at the outside of the hub the scoops tend to fall laterally as they are raised above the horizontal, and are thereby dumped. As they descend they tend to again assume a position perpendicular to the shaft. As shown there are four scoops upon each of the hubs 11, 12, those upon the one alternating with those upon the other. Alternating with the scoops upon each hub are plows 14, for loosening the earth. These plows may be of any desired shape and are rigidly supported by the arms 17, 17^a, 18, the first two of which are secured to the lugs 20, and the last to the lug 19. The oblique direction of the line of attachment of the scoops to the hub results in lateral pressure as the resistance of the earth is encountered. To overcome this pressure locks are provided to hold the scoops rigidly in position while digging. A brace, 30, connects adjacent plows and carries, a hooked spring latch, 31, which is adapted to automatically engage a cross bar, 32, running from the arms 15, to the arms 15^a, of the scoops, as the latter assume their position for digging. A spring is shown at 31^a, for controlling the latch. The braces, 30, serve as stops to limit the swing of the scoops to one direction. A cam, 33, is rigidly mounted upon a frame, 3, forward of the scoops and extends backwardly between the planes in which the plows, 14, on the hubs, 11, 12 rotate, and presents a curved surface across the path of the inner ends of the latches, 31, as the scoops ascend, thereby depressing the latches and freeing their outer ends from

engagement with the bars, 32, so as to permit the scoops to swing outwardly. As the latch passes beyond the cam it is released and re-assumes the position in which it is adapted to re-engage the frame of the scoop as the latter swings back to its perpendicular plane. As shown the cam 33 is bifurcated to allow the passage of the chain 8.

The boiler and engine may be of any preferred form. Their weight should be sufficient to counter balance that of the excavating wheel.

The forward truck 5, is shown as composed of a pair of casters united by a bar 5^a, whereby their angular position may be simultaneously changed. The spindles 23, 23, of these casters extend through the platform 3, are screw threaded and carry nuts 24, 24, above and 25, 25, below the platform for controlling its elevation and thereby regulating that of the excavating wheel.

The means provided for securing the forward movement of the machine are not material. As shown, a cable 21, intended to be made fast to a stake (not shown) in the path of the machine, enters between the rollers 21^a, 21^a, and is wound upon the drum 22, turned by the engine.

If desired one of the hubs, 11, 12, with its scoops and plows may be dispensed with, in which case the trench dug will be but half as wide.

I claim as my invention—

1. In an excavating machine the combination with a rotatable hub, of scoops or shovels, radiating arms for carrying the scoops, said arms being pivotally attached to the hub on a line oblique to the direction of their rotation, substantially as described and for the purpose specified.

2. In an excavating machine the combination with a rotatable hub, scoop bearing radiating arms pivotally attached to the hub, the line of pivotal attachment being oblique to the direction of rotation, and means for limiting the swing of the arms to one side of a vertical plane, substantially as described and for the purpose specified.

3. In an excavating machine the combination with a rotatable hub and scoop bearing arms radiating from the hub and being capable of swinging transversely to the direction of rotation, of latches for locking the arms in their vertical plane during a portion of their revolution and a fixed cam for automatically displacing the latches and releasing the arms, substantially as described and for the purpose specified.

4. In an excavating machine the combination with a rotatable hub of scoop bearing arms radiating from said hub and being capable of swinging obliquely to the direction of rotation, substantially as described and for the purpose specified.

5. In a ditching machine, the combination with a rotary hub, of a series of radiating arms pivotally attached to the hub near each of its ends and adapted to swing laterally, the line of pivotal attachment of each arm being from the end of the hub obliquely backward with reference to the direction of rotation, and toward the circumferential medium line of the hub, and scoops mounted upon said arms, substantially as described and for the purpose set forth.

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

RICHARD DALTON.

Witnesses:
M. H. L. WING,
L. K. GILLSON.