

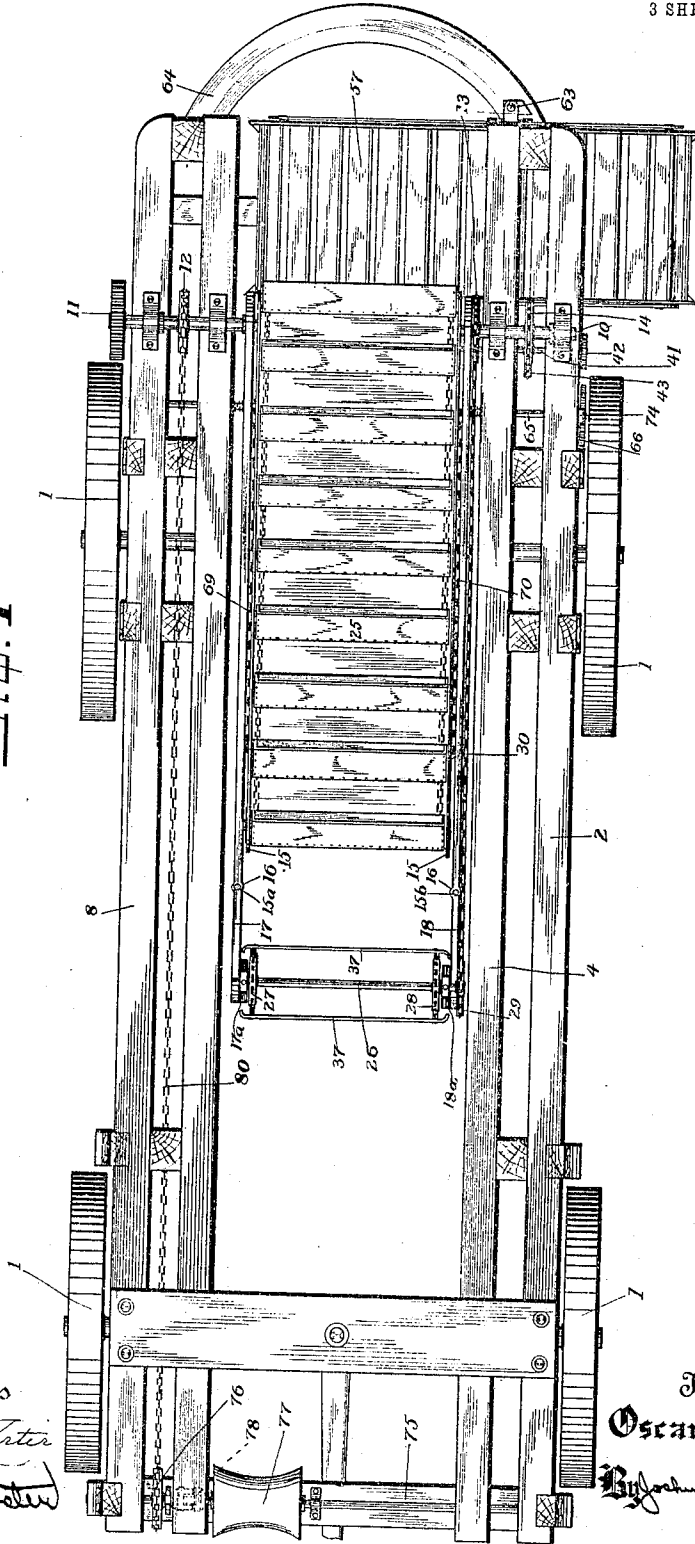
No. 831,094.

PATENTED SEPT. 18, 1906.

O. C. PIERCE.  
DITCHING MACHINE.  
APPLICATION FILED JAN. 8, 1906.

3 SHEETS—SHEET 1.

Fig. 1



Witnesses  
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3 SHEETS—SHEET 2.

Fig. 2

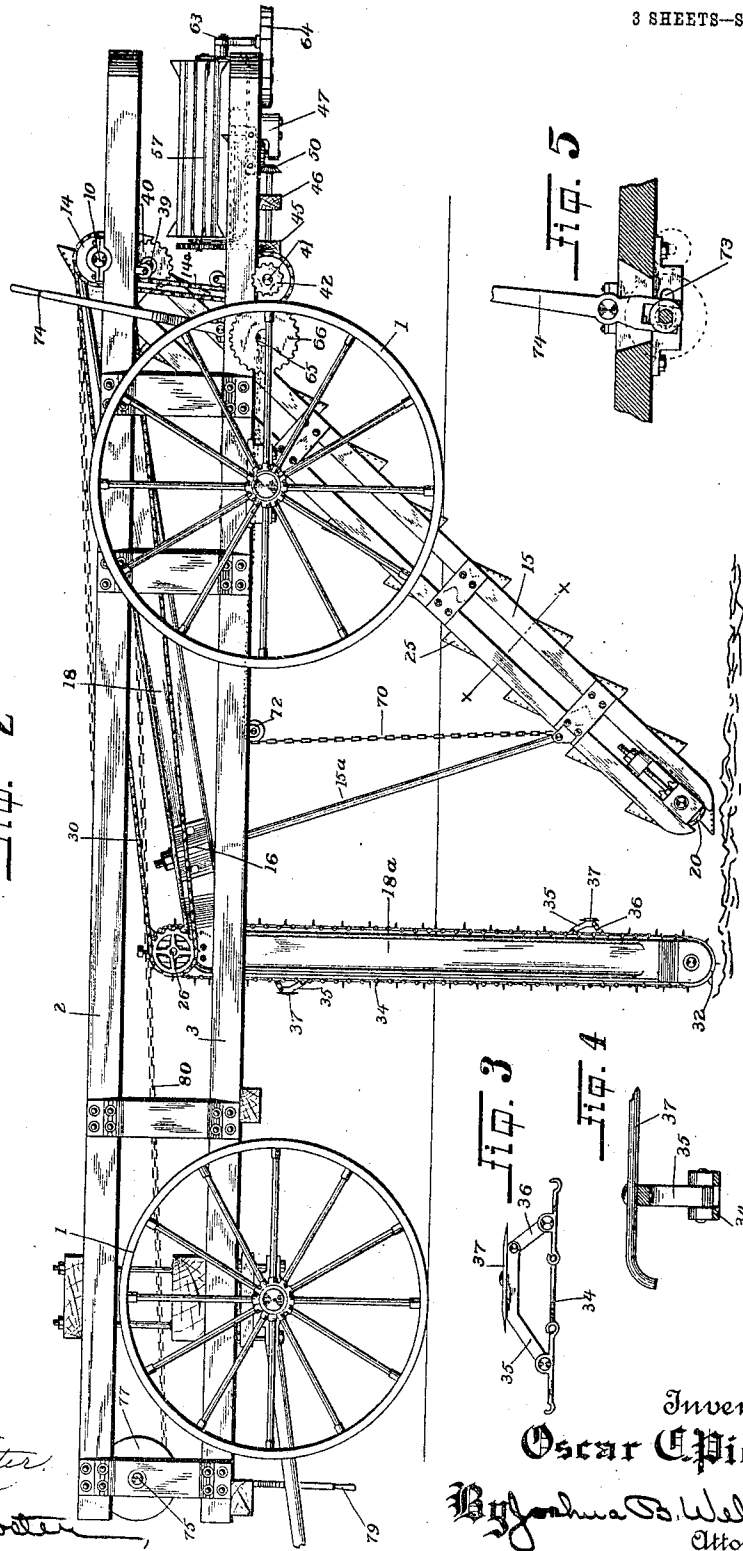


Fig. 5

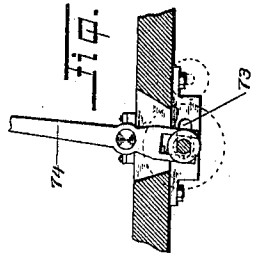


Fig. 3

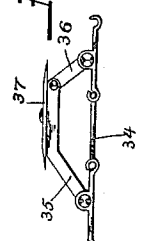
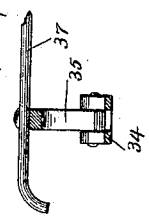


Fig. 4



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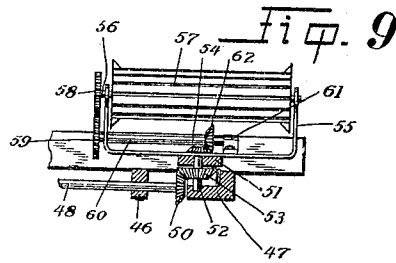
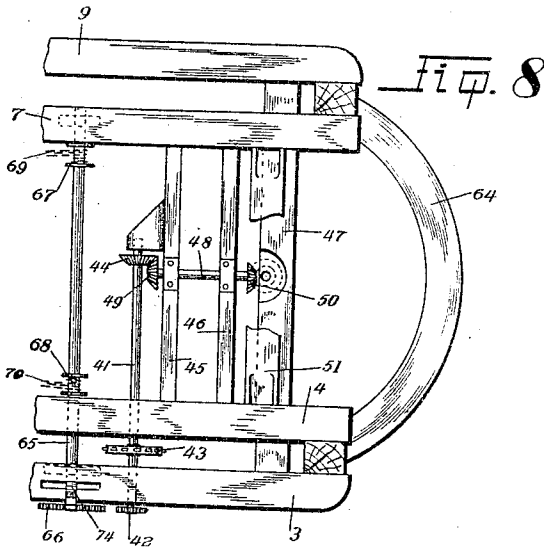
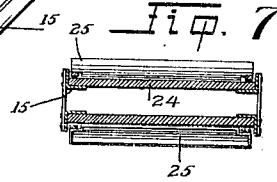
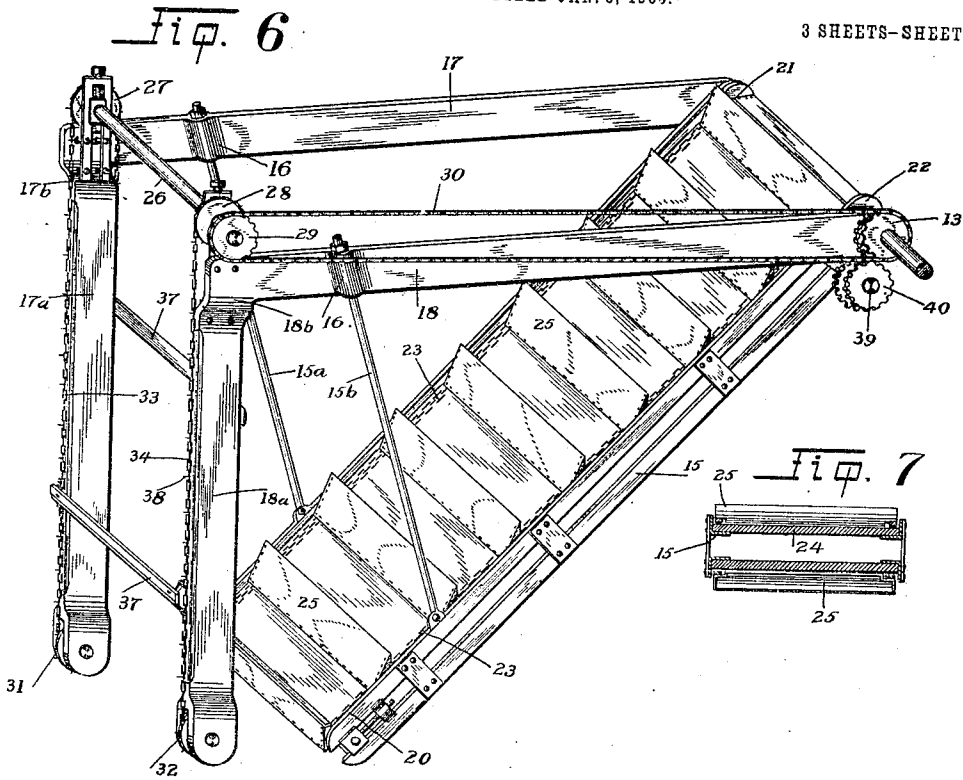
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3 SHEETS-SHEET 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

OSCAR C. PIERCE, OF STOCKTON, CALIFORNIA.

## DITCHING-MACHINE.

No. 831,094.

Specification of Letters Patent.

Patented Sept. 18, 1906.

Application filed January 8, 1906. Serial No. 295,004.

*To all whom it may concern:*

Be it known that I, OSCAR C. PIERCE, a citizen of the United States, and a resident of Stockton, in the county of San Joaquin, State of California, have invented certain new and useful Improvements in Ditching-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 the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in ditching-machines, and particularly to that class used in ditch-making in peat, tule, or similar land; and my object is to produce such a machine as will do the work easily, quickly, and cheaply; also, one which can be easily and inexpensively constructed. This object I accomplish by the peculiar construction and relative arrangement of parts, as will appear by a perusal of the accompanying specification and claims appended thereto.

In the drawings similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a top plan view of my improved device. Fig. 2 is a side elevation of the same. Fig. 3 is an end elevation of a cutting-knife. Fig. 4 is a side elevation of a portion of a cutting-knife. Fig. 5 is a side elevation of a pinion-wheel clutch-lever. Fig. 6 is a perspective view of a cutter and carrier. Fig. 7 is a section taken on a line *xx* of Fig. 2. Fig. 8 is a top plan view of a carrier-gearing. Fig. 9 is an end elevation of a carrier-gearing.

1 designates carrier-wheels, on which I have secured a frame consisting of two sets of four beams each—viz., 2, 3, 4, and 5, and 6, 7, 8, and 9, respectively, the same being suitably secured together.

Near the rear of the beams 2, 4, 6, and 8 is journaled a shaft 10, said shaft having secured thereto a pinion-wheel 11 outside the beam 8, a sprocket-wheel 12 between the beams 6 and 8, a combined cog and sprocket wheel 13 just inside the beam 4, and a sprocket-wheel 14 between the beams 2 and 4. Rigidly secured to the shaft 10 between the two sets of beams aforesaid is a carrier-frame 15 and an inverted-L-shaped cutter-

frame consisting of two horizontal arms 17 and 18 and two vertical arms 17<sup>a</sup> and 18<sup>a</sup>, said vertical arms being bent outward at points 17<sup>b</sup> and 18<sup>b</sup>, respectively. The carrier-frame and the cutter-frame above mentioned are secured together near the outer ends thereof by means of rods 15<sup>a</sup> and 15<sup>b</sup>. At the lower end of the carrier-frame are secured two sprocket-wheels 19 and 20, and on the shaft 10 are two similar sprocket-wheels 21 and 22. 23 represents chains or belts running over said sprocket-wheels. 24 is an upper floor secured to the carrier-frame 15, and 25 represents buckets secured to said chains 23 and scraping over said floor 24.

At the upper ends of the arms 17<sup>a</sup> and 18<sup>a</sup> is a shaft 26, to which are secured two sprocket-wheels 27 and 28, disposed in a line with the arms 17<sup>a</sup> and 18<sup>a</sup>, respectively. To said shaft 26 outside of the arms 17 and 18 is a sprocket-wheel 29, connected to the sprocket-wheel 13 by means of a chain 30. At the lower ends of the arms 17<sup>a</sup> and 18<sup>a</sup> are arranged sprocket-wheels 31 and 32, respectively, said sprocket-wheels being connected with the sprocket-wheels 27 and 28 by means of chains 33 and 34, every other link of said chain and every other sprocket of said wheels being left blank for the purpose, as will be shown. On said chains 33 and 34 are secured two knife-carriers consisting of an angle-link 35, pivotally secured to one of the blank links of said chains, and a link 36, pivotally connecting said angle-link to the next blank link of said chains. On the upper sides of said knife-carriers are secured knives 37, sharp at both edges and curved at the end, as shown on the drawings, Figs. 1 and 4.

To each blank link of the chains 33 and 34 are secured lugs 38 for the purpose as will be shown. To the side of the carrier-frame 15 is journaled a shaft 39, carrying a combined sprocket and cog wheel 40, the cogs thereon intermeshing with the cogs on the wheel 13. To the under side of the beams 3 and 5 is journaled a shaft 41, said shaft having secured thereto a pinion-wheel 42 outside the beam 3, a sprocket-wheel 43 between the beams 3 and 5, connected to the wheel 14 by means of a chain 44<sup>a</sup>, and a bevel-gear 44 between the beams 5 and 7. Secured to the under sides of the beams 5 and 7 are three beams 45, 46, and 47, as shown. On the beams 45 and 46 is journaled a shaft 48, on

one end of which is a bevel-gear 49, intermeshing with the gear 44, on the other end of which shaft 48 is secured a bevel-gear 50.

51 is a block secured between the beams 5 and 7, in which is journaled a shaft 52, on the lower end of which is a bevel-gear 53, intermeshing with the gear 50 and on the upper end of which is a gear 54. Encircling the shaft 52 and bearing between the block 51 and the gear 54 is a substantially U-shaped carrier 55, carrying a shaft 56, on which rotates a side carrier 57 and on the inner end of which is a pinion-wheel 58, journaled in the carrier 55 and in a block 61 on said carrier, on which shaft is a bevel-gear 62, intermeshing with said gear 54.

63 is a roller secured to the carrier 55 and bearing on a track or tramway 64, secured to the beams 3 and 9.

65 is a shaft journaled on the beams 3 and 9 and provided on the outer end with a pinion-wheel 66 and between said beams with two spools 67 and 68, connected with the carrier-frame 15 by means of chains 69 and 70, running over pulleys 71 and 72, connected with the beams 3 and 9, respectively. Said shaft works in a slot 73 and is actuated therein by means of a lever 74, adapted to cause said pinion-wheel 66 to engage with the pinion-wheel 42 when it is desired to raise the frames 15 and 16.

75 is a shaft journaled on the front end of the machine and provided with a sprocket-wheel 76 and a chain or cable drum 77 and a clutch 78, operated by a lever 79, and 80 is a chain connecting the sprocket-wheel 76 to the sprocket-wheel 12.

The *modus operandi* is as follows: Suitable power is applied to the wheel 11, which sets the machine in motion. The wheel 13 and connections cause the knives 37 to cut upward. The wheels 21 and 22 and connections cause the buckets 25 to scrape upward over their floor 24, carrying the dirt upward as the knives 37 cut it loose. The lugs 38 bear the chains 33 and 34 away from the dirt, thus keeping them from getting clogged. When it is desired to change the upward movement of the knives 37 to a downward movement, the chain 30 is taken from the wheel 13 and placed on the wheel 40, thus reversing the movement. The linked knife-carriers 35 36 permit of the same rotating over the wheels 27, 28, 31, and 32. The curved points 17<sup>b</sup> and 18<sup>b</sup> allow the chains 33 and 34 to run in a line with and bear on the arms 17<sup>a</sup> and 18<sup>a</sup>, thus keeping the knives 37 rigid in their movement. When it is desired to raise or lower the frames 15 and 16, the lever 74 is operated so as to throw the pinion-wheel 66 in or out of connection with the pinion-wheel 42, as is desired. The gearing beneath the side carrier 57 permits, as is illustrated on the drawings, of the said carrier being rotated on the tramway 64 in

order to permit the dirt to be either dumped close to the ditch or farther away, or on either side, as is desired. When it is desired to run the machine slower than a horse walks, or for any other reason it is desired to use no horses, an anchor may be placed in front of the machine and connected to the drum 77 by means of a chain or cable, and then the clutch 78 may be thrown into connection by means of the lever 79, and then the wheel 12 and chain sets said drum in motion, thus pulling the machine forward. In practice suitable belting may be used in place of the chains herein described, if it be so desired. The usual chain-tighteners may be used on all the chains.

I have now entered into a detailed description of the present and preferred embodiment of my invention. I do not desire, however, to be understood as confining myself to such specific detail of construction, as such changes and modifications may be made in practice as fairly fall within the scope of my claims.

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

1. In a ditching-machine a frame and an inverted-L-shaped cutter-frame pivotally secured to said frame, as set forth.

2. In a ditching-machine a frame, a shaft secured across said frame, an inverted-L-shaped cutter-frame pivotally secured to said shaft, and cutting means arranged on said frame, as set forth.

3. In a ditching-machine a wheel-carried frame, a main power-shaft arranged thereon, a cutter-frame and a carrier-frame secured to said shaft, cutting means arranged on said cutter-frame and carrying means arranged on said carrier-frame, as set forth.

4. In a ditching-machine a wheel-carried frame, a main power-shaft arranged thereon, a cutter-frame rigidly secured to said shaft, cutting means arranged on said cutter-frame, and means for raising and lowering said frame, as specified.

5. In a ditching-machine a frame, a main power-shaft arranged thereon, a cutter-frame and a carrier-frame rigidly attached to said shaft, said last-named frames being rigidly attached to each other, cutting means on said cutter-frame, carrying means on carrier-frame, and means for raising and lowering said frames, as specified.

6. In a ditching-machine a main frame, a main shaft arranged thereon, an inverted-L-shaped cutter-frame arranged on said shaft, chain-actuated cutter-knives arranged on said cutter-frame, and means connecting said cutting mechanism with said main shaft, as set forth.

7. In a ditching-machine a frame, a main shaft on said frame, an inverted-L-shaped cutter-frame arranged on said shaft, sprocket,

wheels at the upper and lower ends of the vertical arms of said cutter-frame, chains arranged on said pulleys, cutting-knives flexibly secured to said chains, and means for rotating said chains, as set forth herein.

5 8. In a ditching-machine a frame, a main shaft secured thereto, a cutter-frame rigidly attached to said main shaft, knife-carrying chains arranged on said cutter-frames, means  
10 for rotating said chains, and outwardly-extending lugs on said chains, as set forth.

15 9. In a ditching-machine a frame, a main shaft arranged thereon, a cutter-frame, carrying cutter means, rigidly attached to said shaft, a main carrier rigidly attached to said main shaft, a side carrier coacting with said  
20 main shaft, and means for permitting of changing the direction of said side carrier, as set forth.

25 10. In a ditching-machine a frame, a chain-carried cutting device arranged thereon consisting of inverted-L-shaped arms carrying chains, angle-links pivotally secured to one link of said chains, a straight link pivotally  
connecting said angle-link to a third link of

said chains, and knives secured to the tops of said angle-links, as set forth.

11. In a ditching-machine the combination of a frame, a main carrier, a side carrier coacting with said main carrier, a chain-actuated cutting means, and means for reversing the direction of said cutting means, as set forth. 30

12. In a ditching-machine a frame consisting of two sets of four beams each, a main shaft secured thereto, an inverted-L-shaped cutter-frame rigidly secured to said shaft between said sets of beams, sprocket-wheels disposed at the top and bottom of the vertical arms of said cutter-frame in a line  
40 with, chains arranged thereon, knives secured to said chains, means for rotating said chains, and means for reversing the direction of said rotation, as set forth.

In testimony whereof I affix my signature 45 in presence of two witnesses.

OSCAR C. PIERCE.

Witnesses:

PERCY S. WEBSTER,  
JOSHUA B. WEBSTER.