(No Model.) 2 Sheets—Sheet 1.

J. C. HARKER.

DITCHING MACHINE.

No. 312,629. Patented Feb. 24, 1885.

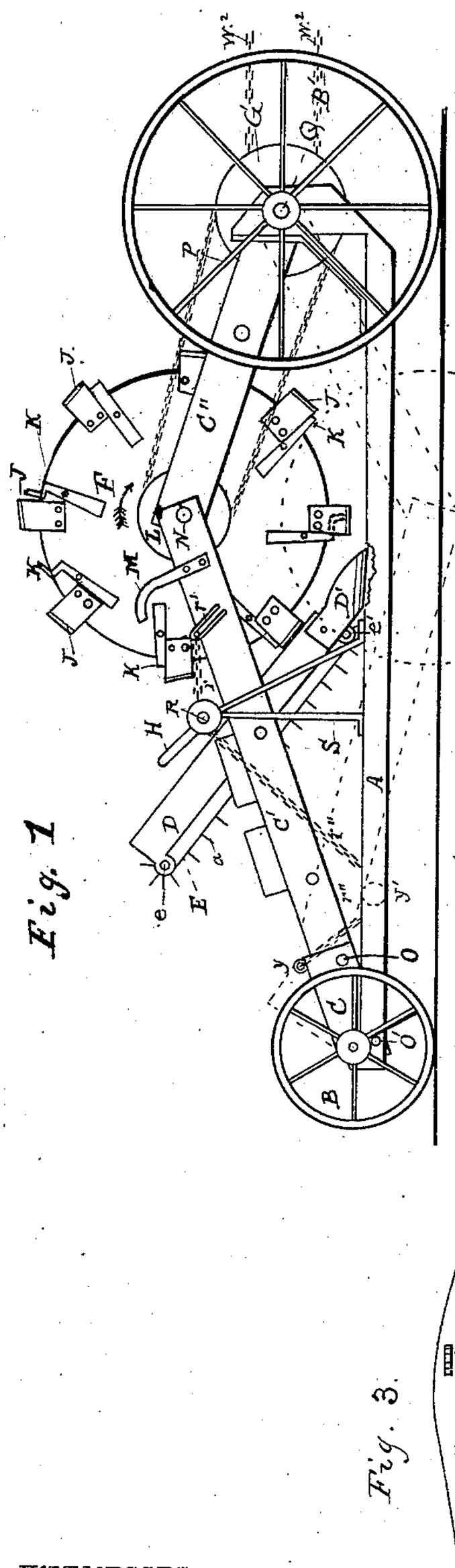

Fig. 1

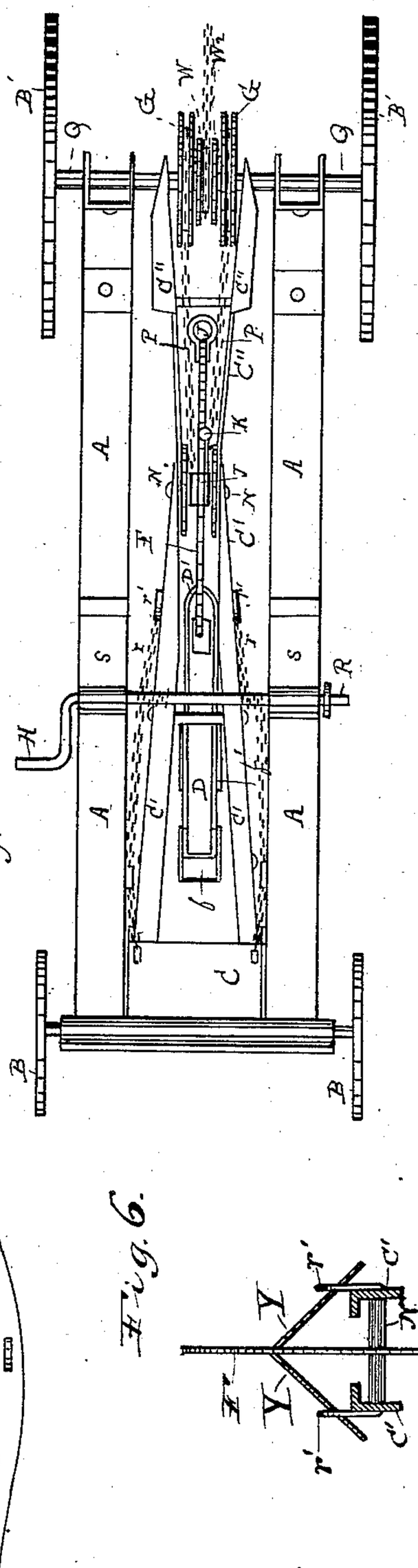

Fig. 2

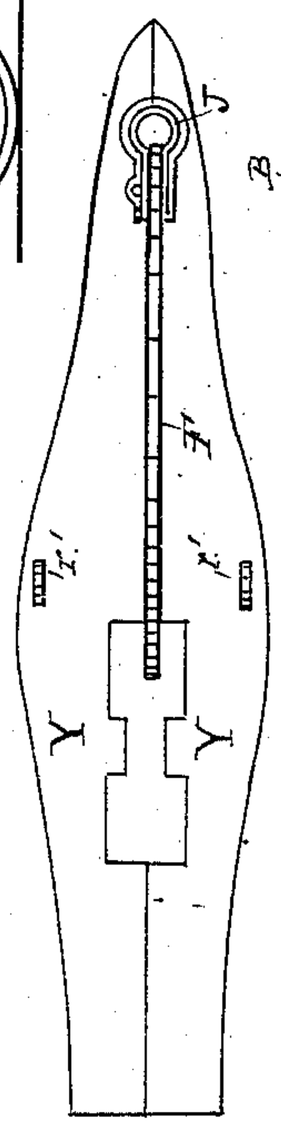

Fig. 3.

Fig. 6.

WITNESSES
Morton Poulnin
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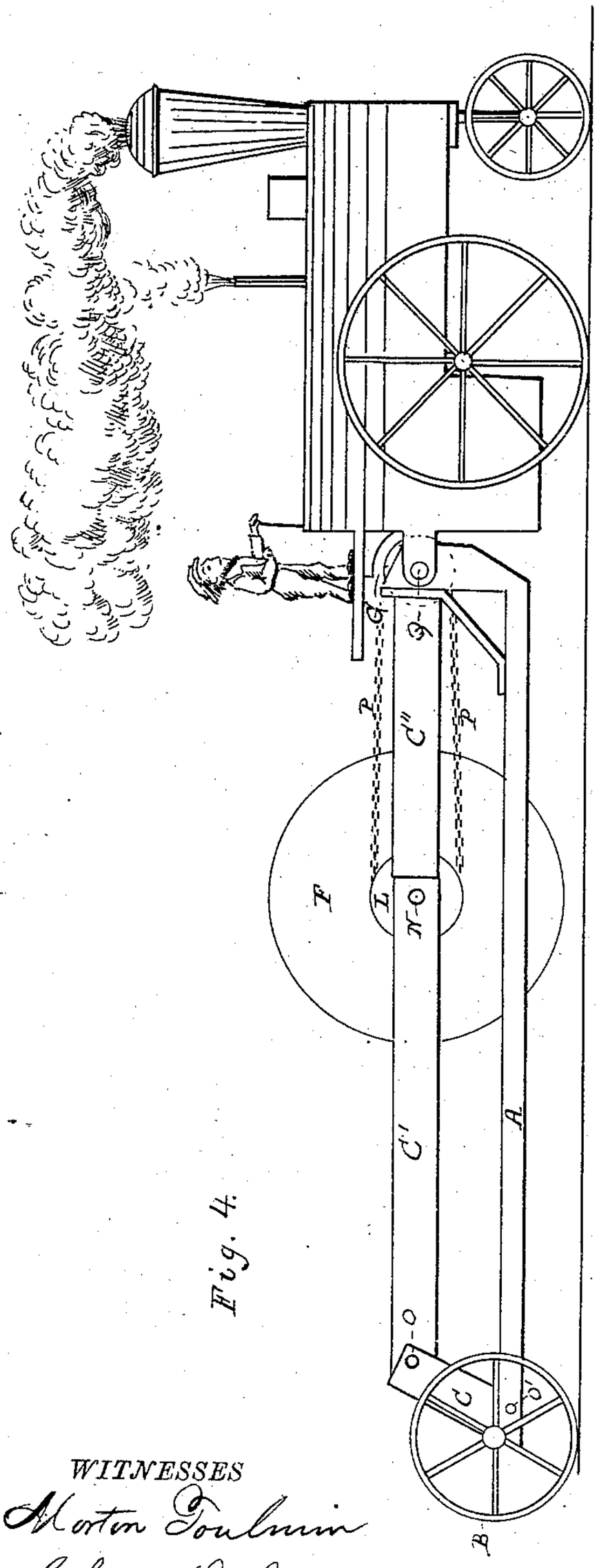

Fig. 4.

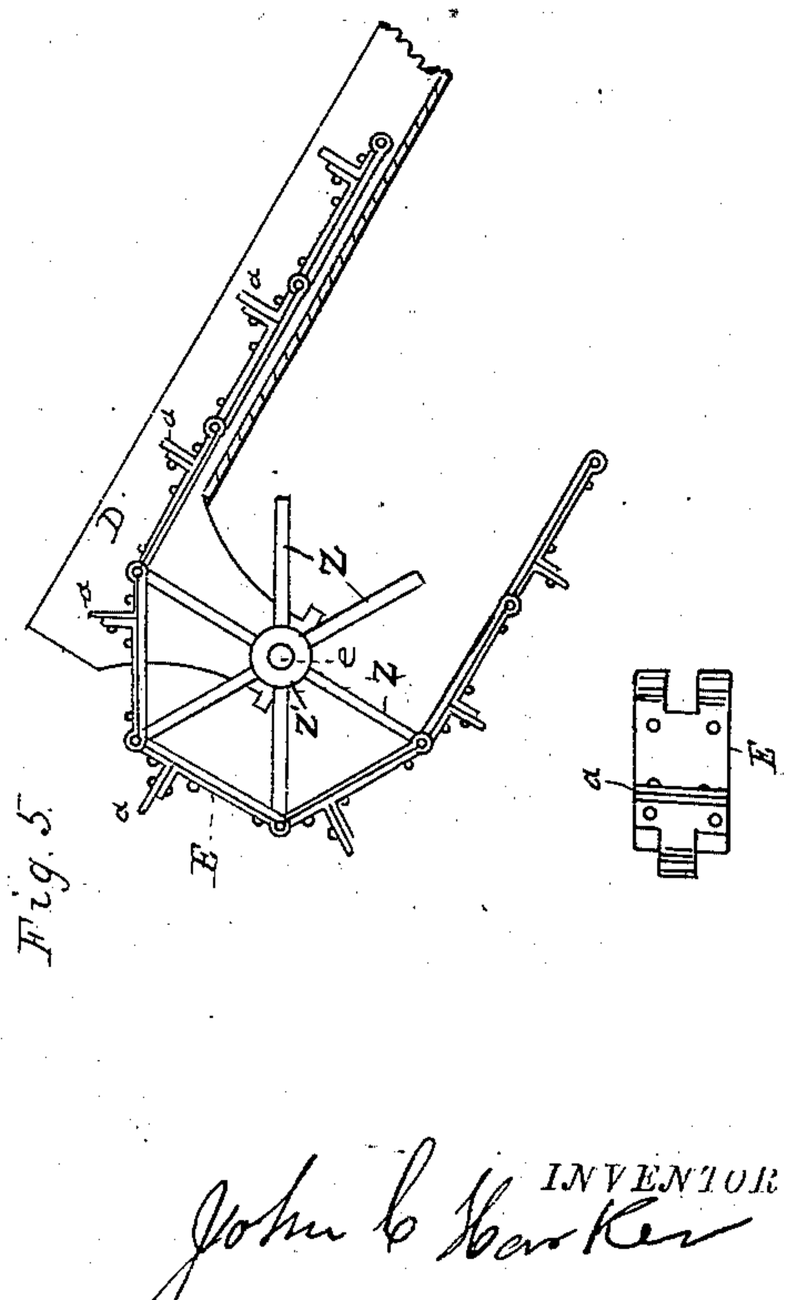

Fig. 5.

WITNESSES

Morton Poulnin

Chas. D. Davis

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John C. Harker

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UNITED STATES PATENT OFFICE.

JOHN C. HARKER, OF GRAND JUNCTION, IOWA.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 312,629, dated February 24, 1885.

Application filed December 30, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. HARKER, a citizen of the United States of America, residing at Grand Junction, in the county of Greene and State of Iowa, have invented certain new and useful Improvements in Ditching-Machines; and I do hereby 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 letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in ditching-machines, and has for its object the easy adjustment to ditches of various depths and the elevation of the earth taken therefrom to any desired height. These objects are attained by the mechanism illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is a plan. Fig. 3 is a plan of the shields Y and part of the wheel F, showing the relative positions of the two. Fig. 4 is a side elevation when operated by a traction-engine. Fig. 5 is a detail view of a portion of chute D and belt E; and Fig. 6, a transverse sectional view of the frame and the shields, and an edge view of the disk, showing the relative position of the same.

A is a frame, mounted on the wheels B and B′, which supports the machine.

C C′ C″ is an adjustable frame, near the middle of which is a transverse shaft, N, which supports the wheel F and the pulleys L. The shaft N passes through the sides C′ C″, upon which they turn, as upon a pivot. The other ends of the sides C″ are supported by the axle Q, which passes through both of them. The sides C′ are pivoted to the movable bearing C at O, and the movable bearing C is secured and pivoted to the frame A by a bolt or rod, O′, which passes through the whole from one side of frame A to the other in such manner that the bearing C may be placed in a vertical position, or inclined at various angles to the frame A, and consequently enables the frames C′ C″ and the wheel F to be raised and lowered as desired. On top, the part C′ has two openings, *f* and *f′*. Through the latter is inserted a trough or chute, D, having pivoted to its lower extremity a shoe of scoop-like form, D′, and is also provided with transverse shafts *e e′*, which carry sprocket-wheels, over which is passed an endless metal belt having projecting wings *a* perpendicular to its face, the object of which is hereinafter described. The shaft *e* may be provided with a suitable pulley or sprocket-wheel, which is driven by another secured to the axle Q by means of a belt or chain, and motion may by this means be given to the elevator-belt E.

F is a wheel fastened to the shaft N, and is provided with scoops J, secured by rivets, or in any suitable manner.

K are levers swung on a pivot, and have an elbow at the outer end, to which is attached a sheet-metal disk, which enters the cavity of the scoop and prevents its contents from falling out, and at the proper moment it is so arranged as to automatically discharge the same.

M is an arm secured to the side C′, and is made of the proper form to reach and tilt the levers K as they are carried around by the wheel F, and in this manner throw out the contents of the scoops J. The shaft N has a pulley, L, on each side of it, adapted to be driven by chains P from pulleys G, secured to the axle or shaft Q.

W is a sprocket-wheel secured to the shaft or axle Q, and is used for the purpose of giving motion to the axle and to the entire machine by means of a chain, W^2, which is passed over this wheel and its ends secured to a windlass or capstan placed at a suitable distance ahead of the machine, so that when the capstan is turned rotary motion will be given to the shaft Q.

S are standards secured to the frame A, and are provided with suitable bearings at the top for the shaft R.

R is a transverse shaft having crank-handle H and ropes or chains *r*.

r′ are staples or eyes, and are for the purpose of securing the ends of the chains *r*, and also the shields Y.

y is an eyebolt or hook secured to the bearing C, and forms a fastening for the chains *r″*, which pass down under pulleys *y′*, attached to frame A, and thence upward and around the

shaft R, which serves the purpose of a windlass.

Y are sheet-metal shields placed on each side of the wheel F, and are intended to carry off the dirt and throw it away from each side of the ditch.

The side elevation, Fig. 1, shows the machine with the wheel F raised clear of the ground, and in this position the side frames, C′ C″, act as braces and require no other support. When thus adjusted, the machine may be carried from place to place by horse or other power. It is chiefly intended for tile-ditching, and its peculiar construction allows the center of the wheel F to sink in the ditch below the surface of the ground. Where the earth is soft, the wheel F may be run in the direction shown by the arrow; but in hard ground the wheel F may be removed and reversed and then be run in the opposite direction. The elevator E is intended to elevate the earth from the bottom of the ditch which may not be carried up by the scoops J, or which is scraped up by the shoe D′, and also to widen the ditch, which may be done by a series of troughs, D, each wider than the other. The shaft R acts as a windlass, and is for the purpose of operating the chains *r r″*, which are to raise and lower the frames C C′ C″. The chains *r″* act also to hold the frames C′ C″ down when the wheel F is lowered into the ditch.

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

1. In a ditching-machine, the combination of the parts C, C′, and C″, constituting the frame, with the chute D, having shoe D′, and elevator-belt E, substantially as described, and for the purposes set forth.

2. In a ditching-machine, the combination of the wheel F, adapted to be raised and lowered by the parts C′ C″, constituting the frame, with scoops J, and levers K, adapted to retain and discharge contents of scoop, as shown and described, and for the purposes set forth.

3. In a ditching-machine, the combination of wheel F, having scoops J, with the frame C′ C″, and adjustable bearing C, substantially as described, and for the purposes set forth.

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

JOHN C. HARKER.

Witnesses:

MORTON TOULMIN,

H. J. ENNIS.