S. Bentley,

Excavator.

No. 93,401. Patented Aug. 10. 1869.

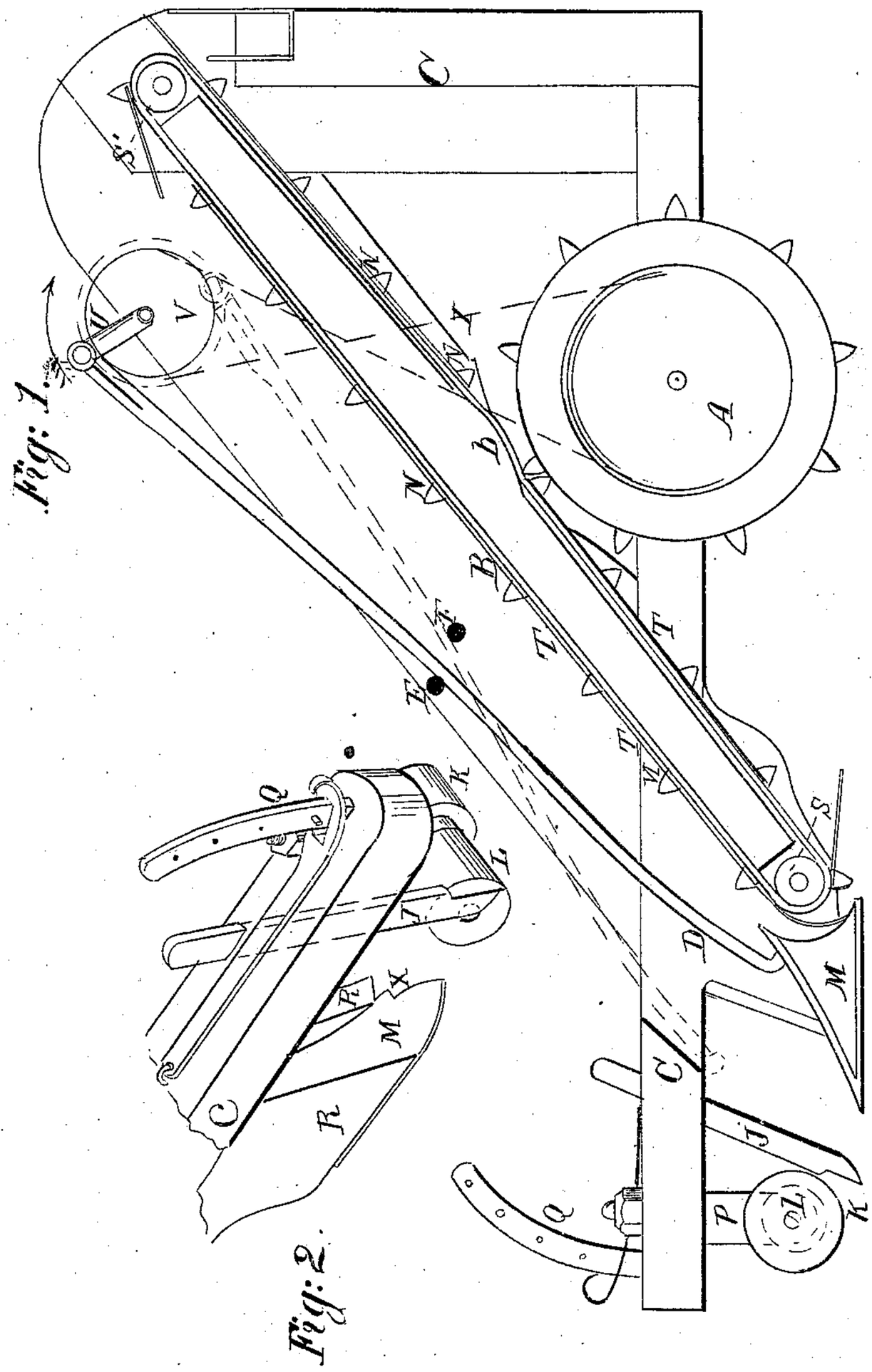

Fig: 1.

Fig: 2.

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SPENCER BENTLEY, OF GREEN OAK, MICHIGAN.

Letters Patent No. 93,401, *dated August* 10, 1869.

IMPROVED DITCHING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To whom it may concern:

Be it known that I, SPENCER BENTLEY, of Green Oak, in the county of Livingston, and State of Michigan, have invented a new and useful Improvement in Machines for Ditching-Purposes; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and being a part of this specification.

Figure 1 is a side elevation, with the side of the case removed.

Figure 2 is a perspective view, from the opposite side, of the front of the machine.

Like letters refer to like parts in each figure.

The nature of this invention relates to the construction of a machine for excavating ditches; and consists in a new form of shovel, for cutting one side of the ditch, when moving in one direction, and the opposite side when moving in an opposite direction, with a novel elevator for removing the dirt excavated, so arranged as to prevent clogging; also in a device for drawing the dirt from the shovel to the elevator.

C, in the drawings, represents an open frame, its rear end being supported by a traction-wheel, A, whose shaft is journalled into the sides of the frame.

This wheel is provided with teeth, for the double purpose of giving it a firm hold on the ground, and for operating the elevator by means of the cleats N, with which said teeth engage.

The forward end of the apparatus is supported by a pair of bearing-wheels, K L, (the latter of which is shown in dotted lines in fig. 1,) revolving on a shaft secured to the adjustable standard P, the depth of cut being regulated by the nut Q, on the top of said standard.

J is a cutter, secured to the beam immediately in the rear of the bearing-wheels, for the purpose of dividing the earth in the centre of the proposed ditch.

R are cheeks or side plates attached to, and suspended from the frame C.

M is a shovel, secured between said cheeks, and which is made in the form shown in the drawings. The right lip or edge of the cheek should be faced with steel to cut the clay in forming the right wall of the ditch.

The shovel is formed with an offset or jog, X, on the left side, the bottom of the cheek on the same side being cut away, which will leave in the bottom of the ditch a corresponding ridge, upon which the bottom of the left cheek will slide and have a bearing, to assist in keeping the apparatus upright. By this arrangement the space between the cheeks is greater than the width of the ribbon of clay taken up by the shovel, allowing the clay to spread out on the elevator, and preventing any tendency to clog in its passage.

S are corugated chain pulleys, which carry the endless-chain elevator B, which is constructed in the following manner:

Two pieces of what is termed "jack-chain," of suitable length, are taken, which have their ends joined together, so as to form two endless belts, and which serve as a foundation and carrier for the superstructure of the elevator.

N are iron cleats or flanges.

T are sheet-metal plates, cut the width of the interior of the case, and one end thereof secured to the chains heretofore mentioned. The same bolts, screws, or rivets may pass through the iron cleats or flanges, and thereby secure them, as well as the plates, to the chains. These cleats or flanges should, in their distance from each other, correspond with the spurs on the driving-wheel, with which they engage, and from which the elevator derives its motion, in the forward motion of said driving-wheel.

A swell, *b*, is formed on the under side of the carrier-case, under which the carrier passes in close proximity with the driving-wheel A, and is designed to act as a tightener to compel the engagement of the cleats or flanges N with the cogs or spurs on said wheel.

If the plates T are so placed on the carrier as to overlap a trifle, no dirt can possibly fall down between them, but should any fall through the small space between their edges and the sides of the casing, as they are attached to the carrier by one end only, it will fall through those on the under side of the carrier to the bottom of the ditch, whence it will be taken up at the next passage of the implement.

D is a hoe, operated by the cranked shaft U, which in turn is operated by a belt, I, from a supplementary pulley on the side of the driving-wheel A, passing over the pulley V, which is secured to the shaft U.

The shaft of the hoe works between the stops E and F, which form fulcra by means of which, and the action of the crank, the hoe is raised in moving forward, and is depressed against the shovel M, in receding, scraping the dirt from the shovel on to the plates of the carrier.

When the dirt arrives at the top of the casing, each plate is tilted in passing over the pulley S′, and the dirt thereon is dumped into the discharge-spout O, which delivers it at one side of the ditch.

To make the finishing-cut at the bottom of the ditch, the position of the bearing-wheels should be reversed, thereby allowing the larger wheel to run in the deeper side of the cut, while the apparatus cuts the opposite side to an equal depth.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The hoe D, and stops E and F, and crank G, in connection with driving-pulley H, belt I, and driving-wheel A, when constructed and operating substantially as and for the purposes specified.

2. The machine described, consisting essentially of the frame C, shovel M, conveyer N T B, hoe D, and bearing-wheels K L, the whole being combined and operated as and for the purpose set forth.

SPENCER BENTLEY.

Witnesses:

LOUIS C. HYDE,

GEORGE RUHLANDT.