(No Model.)

I. WEBSTER.

DRAIN TILE LAYING MACHINE.

No. 305,363. Patented Sept. 16, 1884.

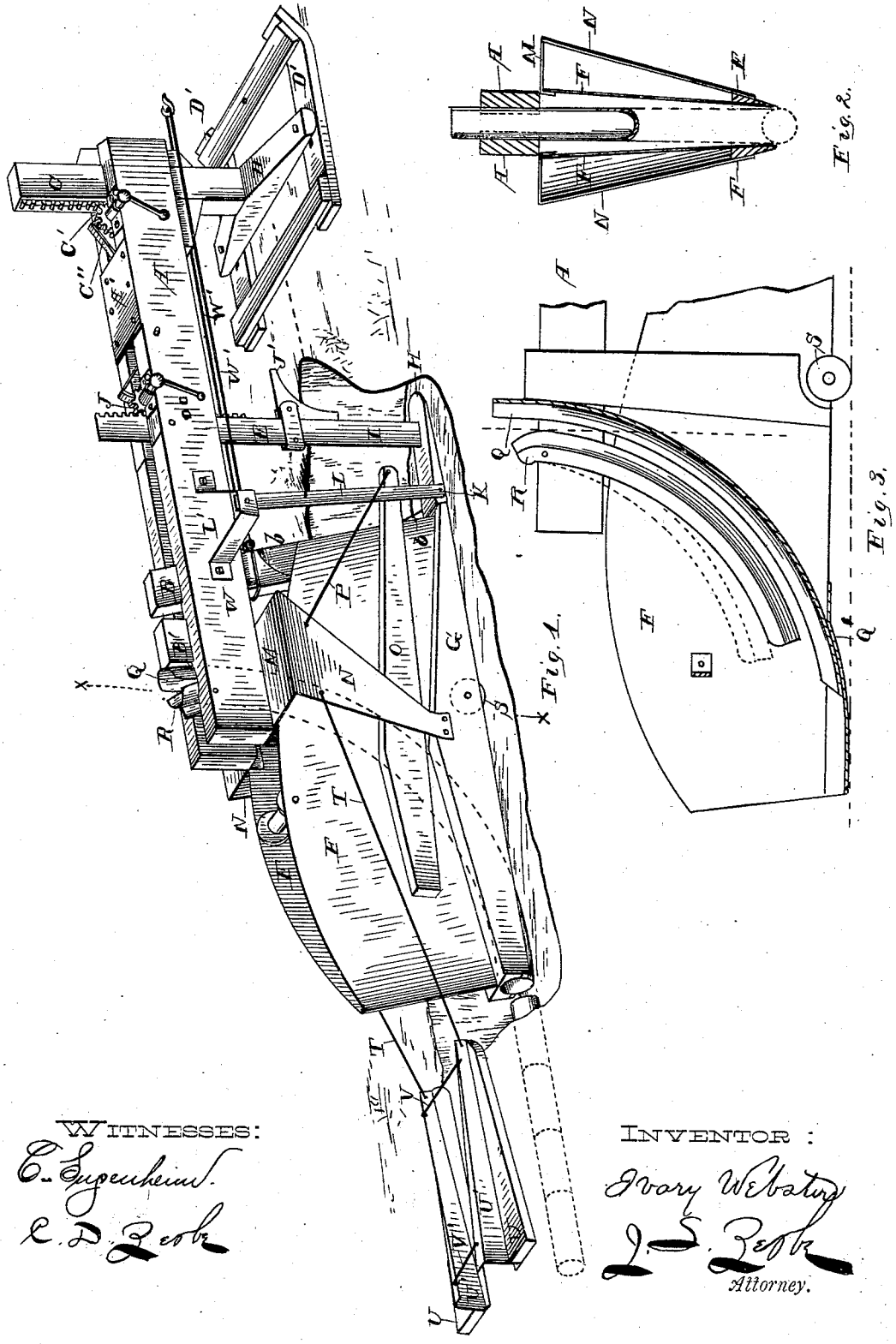

Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES:

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IVORY WEBSTER, OF WEST LIBERTY, IOWA.

DRAIN-TILE-LAYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 305,363, dated September 16, 1884.

Application filed June 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, IVORY WEBSTER, of West Liberty, in the county of Muscatine and State of Iowa, have invented a new and useful Improvement in Drain-Tile-Laying Machines, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a perspective view of my improved drain-tile-laying machine. Fig. 2 is a transverse vertical section through X, and Fig. 3 a longitudinal central section showing the chute.

In the tile-laying machines in general use the chief objections lie in the fact that the depth of laying cannot be properly gaged, and also the tile, after being laid or placed within the trench, is not sufficiently covered with soil, which necessitates considerable labor to place the land in a condition for farming purposes.

My device consists of beams formed of two parallel pieces, having between them at the forward end a vertical post operated vertically by means of a rack and bar, and having at the lower end a guiding-shoe for guiding the depth of the device. Rearwardly, a colter provided at the lower end with a hinged shoe has also at the upper end a rack and bar, and rearwardly beneath the beam a peculiarly-shaped mold-board, provided inwardly with a chute to convey the tile. Externally the mold-board is provided on each side with one or more inclined planes or ways for elevating the earth within the trench, depositing the tile beneath, and permitting the earth to again resume its original position. Suitable hinged guards are provided to aid in conveying the earth rearwardly. Beneath the mold-board is placed a roller which forms a cove to receive the tile. By means of suitable rods extending rearwardly I provide a pair of guides to assist in placing over the tile such a part of the soil as may be thrown outwardly from the trench by the machine, all of which will now be fully set forth in detail.

In the accompanying drawings, A are a pair of parallel beams set on edge and at a little distance apart, and of suitable length. These are secured together by means of bolts and connecting-pieces A′. Between these beams, near the rear end, I provide a pair of posts, B and B′, a short distance apart, and secured in position by means of suitable bolts. At the forward end and between the said beams A a vertical post, C, is provided between the connecting-pieces A′, its rearward side being provided with a rack and pinion, C′, having laterally a crank or other device for operating the vertical post. A pawl, C″, is provided to engage with the rack-pinion C′. At the lower end of this said post C, I provide a transverse beam, D, to which is secured on the lower side longitudinal pieces D′, connected together at their front and rear ends to act as a shoe and gage, and which moves along over the surface of the ground. To facilitate the operation of this rectangular shoe I provide slots in the slide-piece D′ to receive the bolts at the ends of the beam D, which permits it to move freely along the surface of the ground and pass over any uneven place. The lower end of the post B inclines forward somewhat, and has on its front side a suitable metallic share, *b*, and extending thence rearwardly on each side of this post B, at the sides of the posts B′, and connecting some distance rearwardly, are placed mold-boards F, diamond-shaped in horizontal cross-section, of any suitable material. The lower part of each of these mold-boards F has an enlarged part laterally, the upper side forming an inclined plane, G, upwardly from the forward end near the center of mold-board F, and then inclines downwardly to the rear. At the forward end of this inclined plane a shoe, H, is hinged, its forward end forming a broad cutting-point. The upper surface centrally has a share, J′, hinged thereto. The upper end of the share passes between the beams A, and is provided with a rack and pinion, J, with a pawl and suitable crank or other device for operating attached thereto. A share, J′, is secured on the share I by means of a link and made adjustable to any height to facilitate the cutting of the soil. The bolt K, by means of which the shoe H is hinged to the inclined plane G, has also secured at the ends upright pieces or cutters L, and the upper ends of said cutters incline laterally somewhat, and also rearwardly at about the same angle as the share E, and are secured in position by means of the brackets L′, extending outwardly from the beams A.

Laterally from the lower side of the rear end of the beams A wings M extend, curving

downwardly at N a short distance therefrom, and connected at their lower ends to the side of the highest point of the inclined plane G. These are designed to be formed of metal, preferably, and in the same plane and at the same angle laterally as the cutters L. Just within the cutters L and N, I provide one or more suitable pairs of guides, O, the upper side turned inwardly, forming a flange in conformity with the inclined plane G. The forward ends of these guides O have rods P secured thereto, which rods extend upwardly and rearwardly, and are hinged at the upper end of the wing M. This permits the guides O to move along at the surface of the ground, for the purpose of retaining the core of earth at the side of the machine.

Immediately in the rear of the post B′ is a chute, Q, extending down and rearwardly and terminating at the lower and rear part of the machine between the inclined planes in a shoe, Q′. The upper part of the chute is hemispherical in form, and has hinged at its upper end, immediately in the rear of the said chute, a curved arm, R, also hemispherical in cross-section. The two hemispherical curved pieces together form the chute designed to receive the tile as the machine moves along. Immediately forward of the lower end of this chute a roller, S, is journaled in the beam of the machine. The periphery of this roller is designed to be curved in cross-section, and to extend somewhat below the bottom of the machine, so as to form a cove in the bottom of the trench.

To the upper end of the cutters N, I connect a pair of rods, T, extending rearwardly and having attached thereto a pair of wedge-shaped pieces, U, having on their inner sides metallic pieces U′. The lower part of these metallic pieces extends inward horizontally, while the other part extends up nearly at right angles, and is secured to the inner side of the wedge-shaped pieces. Near the forward end of these pieces a transverse rod, V, is secured and at their rear end a shorter rod, V′, is provided. These pieces slide along on the top of the ground, and serve to throw inwardly all loose dirt which may be thrown out by the machine. A clevis or link, W, is placed around the post B immediately beneath the beams A, to the forward ends of which are secured the ends of the pair of rods W′, passing forward on either side of the post C a short distance beyond, where they unite and have attached thereto a hook or clevis, to which animals or other means or propulsion may be secured.

The operation of this device is as follows: The gage-shoe at the forward end of the machine attached to the post C is raised to such a height from the ground as it is designed to lay the tile, by means of a pawl, rack, bar, and pinion C′, and secured by means of a rack and pinion connecting to the share I and shoe H. As the machine moves forward, the dirt is sliced into two cores, one-half of which passes on each side of the mold-board F. At the same time the inclined planes G elevate the core from the trench and permit the introduction of the tile through the opening of the chute. As the soil passes at its rear part, it rests above the tile. The guides O serve to keep the cores from turning out laterally, while the loss of the dirt that might be incidentally thrown out laterally by the machine is thrown inwardly immediately over the cores. As will be noticed, the tile may be laid at any depth by elevating the post C or the share and shoe H.

What I claim is—

1. In a drain-tile machine, a shoe hinged rearwardly, its forward end forming a broad cutting-point, and having on its upper surface centrally an upwardly-inclined share hinged thereto, and an adjustable share having its forward face concave placed thereon, the upper end provided with a rack, pinion, pawl, and suitable crank device for operating, substantially as herein set forth.

2. In a drain-tile machine, the metallic share extending rearwardly on each side of the post and connected at the same distance rearwardly, forming mold-boards diamond-shaped in horizontal cross-section, and having an inclined base, substantially as herein set forth.

3. In a drain-tile machine, a pair of guides, O, placed inwardly from the laterally-inclined cutters, the upper side turned inwardly, forming a flange, the forward end having a rearwardly-inclined rod secured at the upper wing, substantially as and for the purposes herein set forth.

4. The combination of the parallel beams having a pawl, pinion, and crank device, with a share or cutter, E, having thereon an adjustable cutter, J′, as shown, and having at the lower end a hinged shoe, H, substantially as herein set forth.

5. The combination of the parallel beams, the laterally-extending brackets, and inclined cutters, with diamond-shaped mold-boards and inclined plane G, substantially as described.

6. The combination of the parallel beams, the diamond-shaped mold-boards, the wings, and inclined cutters, with the horizontally-projecting rods, having attached thereto a pair of wedge-shaped pieces having a metallic base flaring inwardly, connected at their forward ends by a rod, and rearwardly by a somewhat shorter rod, substantially as herein set forth.

7. The combination of the diamond-shaped mold-boards with the upright posts, and the parallel beams with a roller beneath the base of the mold-board, substantially as herein set forth.

8. The combination of the diamond-shaped mold-boards with the upright posts, the parallel beams, and the roller beneath the base, with the chute between the mold-boards curved

downwardly and rearwardly, substantially as herein set forth.

9. The combination of the parallel beams having at the forward end the gage device and rearwardly the hinged shoe and cutter, the laterally-inclined cutter, the chute, the mold-boards having the inclined base, the guide-pieces hinged at their forward ends, and the cove-roller, the whole combined and arranged as and for the purposes as herein set forth.

10. The combination, in a drain-tile-laying machine, of the beams A, the upright share or cutter having on either side outwardly inclined cutters, and the mold-board having the double-inclined planes G, substantially as described.

11. The combination, with a drain-tile machine, of the attachments U U', having the wedge-shaped pieces with inwardly-extending bases, the forward end connected by means of a rod, and rearwardly by a shorter rod, as described.

In testimony that I claim the foregoing I have hereunto set my hand, this 29th day of May, 1884, in the presence of witnesses.

IVORY WEBSTER.

Witnesses:
F. L. DAYTON,
L. W. SWEAR.