J. H. ELWARD.

Mole-Plow.

No. 30,625. Patented Nov. 13, 1860.

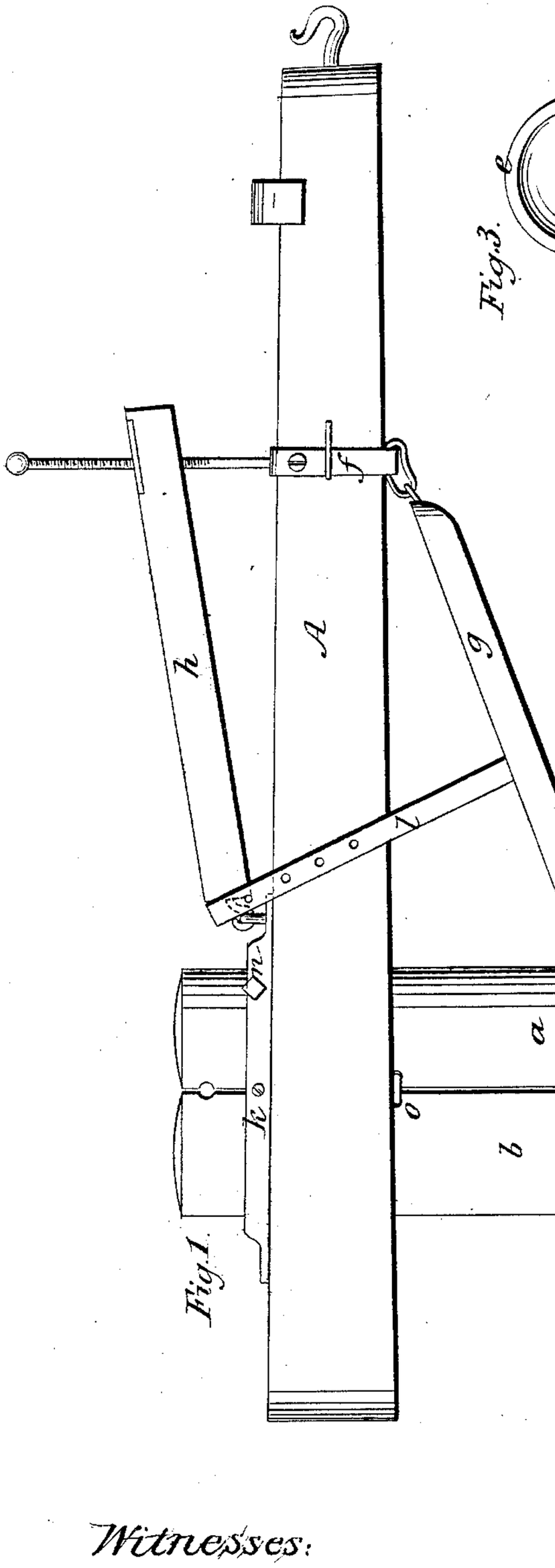

Fig. 1.

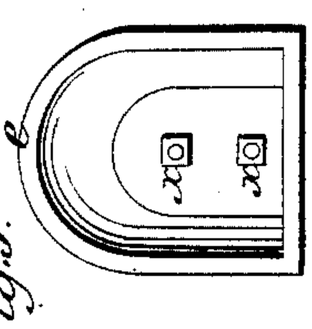

Fig. 3.

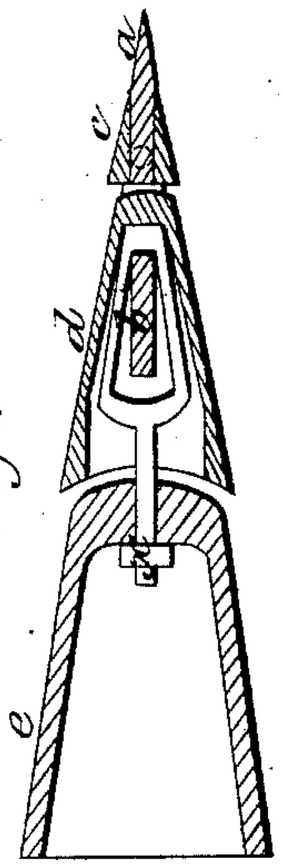

Fig. 2.

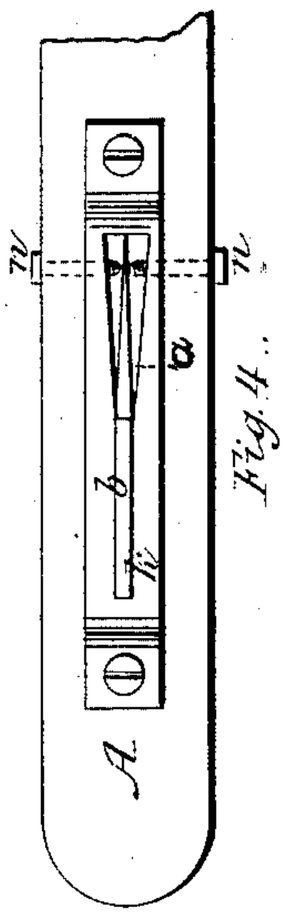

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN H. ELWARD, OF OTTAWA, ILLINOIS.

IMPROVEMENT IN MOLE-PLOWS.

Specification forming part of Letters Patent No. **30,625**, dated November 13, 1860.

To all whom it may concern:

Be it known that I, JOHN H. ELWARD, of Ottawa, La Salle county, and State of Illinois, have invented certain new and useful Improvements in Mole-Ditchers or Draining-Plows; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference thereon.

Figure 1 represents a side elevation of a plow containing my improvements. Fig. 2 represents the shape of the mole of my plow, and Fig. 3 represents the shape of the rear end of the mole.

My improvements consist in the invention of means by which a mole-ditcher or drain-plow may be made to pass through its course and to make any variations in the direction of its path without leaving any angles at its several points of turning, and in the use of which any desired degree of curve may be given to the direction of the plow without changing the position of the power that may move it, which is cheap in construction, simple in character, and of much lighter draft.

A principal objection in practice to drain-plows as formerly constructed has been that a change in the direction of their path could not be readily made without making an angle more or less acute at the several points where such change was made, and because it was generally necessary to remove the plow back in its path from the point at which the change in its direction was to be given, which occasioned delay, and was rendered necessary, also, for the purpose of opening the earth with a shovel or spade to avoid an undue strain upon the plow, and because a change of direction could not be given to the plow without changing the position of the power that moved it. It is only necessary to state these objections to illustrate their force. In my improvements I provide the appropriate means to give any desired curvilinear direction to the drain without removing the plow from the ground without changing the position of the power that moves it, and which entirely avoids any angles in the drain or ditch.

Figure 1 represents the general structure of my improved mole-ditcher, A being the beam thereof, with a slot through it to receive the colters *a* and *b*, which also pass through the metal plate K, which is made fast to the beam, with a similar slot in it, and which slot corresponds with and is over the slot in beam. The colters *a* and *b* are linked together by links at *o o*, and they are kept in position and the direction of the plow is controlled in part by set-screws *n*.

The slot in the metallic plate K and in the beam A is represented in Fig. 4 with the colters *a* and *b* in position, and the front end of it is made twice as wide as it is at the rear end of it, the width being gradually increased from the point of contact between the colters *a* and *b*, and gradually increasing in width toward the front end to permit a lateral movement of the front edge of the colter *a* to the right or left, as represented by the drawings, which is accomplished by withdrawing the set-screw on one of its sides to any desired distance and then forcing the other screw up until the opposite side of the colter is pressed hard against the end of the screw that is withdrawn, and by changing the position of the respective screws an opposite change of direction may be given to the front colter; and *c*, Fig. 2, represents the forward section of the mole, being a part of the movable colter *a*, and it corresponds in width at its rear end with the width of the front end of the middle part of the mole, (marked *d*,) to which the colter *b*, which is stationary as to any lateral movement, is attached. The base of the rear end of the part *c* of the mole has a slot in it of such size as to enable it to move on a pivot, *y*, on the front end of the part *d* of the mole. The rear section, or the part *e*, of the mole is of the shape represented in Fig. 3, and is flexible as to lateral movements, being fastened to the part *d* by nuts on loop-hinges, (represented by the letters *x* and the dotted lines in Fig. 1.)

The construction of the colters and the mole is such that when the colter *a* is turned, in the manner before stated, to the right or the left the mole, as constructed, will assume in its passage through the earth a curved form or shape, because the rear part of the mole will be forced naturally to follow the course or direction of the front part of it. The beam A has a metallic band on it at a distance of about one quarter back of the front end of it, to which is attached on either side an iron hook, to which to attach the ropes or chains for draw-

ing the plow, and on the lower side of said band is fastened the piece *g*, by which to regulate the depth of the drain to be made. It is constructed as follows: The piece *g* is a piece of plank of the width of four or more inches, fastened by a joint to the metallic band, before mentioned, at one end, and from near the other end rises a thin short bar of iron, (marked *l*,) on each side of it, and each of them is pierced with four round holes opposite each other. These rods are of such distance apart as to pass up, one on one side of the tongue or beam of the plow and the other one on the other side of it; and a rod of metal is placed in any of the series of the before-mentioned holes and on the beam of the plow, to regulate the depth of the ditch or drain to be made; and to the front end of the metallic piece K is hinged a lever, *h*, which is made to rise or fall between the bars *l* by means of a screw, which rises from the band *f* and passes through the lever *h*. The use of this lever is to bear upon the metallic rod that passes through the holes in the bars *l*, and thereby prevent the machine running deeper at any time than shall be desired.

Across the front of the beam, and at a distance of some ten or fifteen inches from its forward end, is a piece transverse to the beam and firmly fastened to it, and having three or more open slots in it on each side of the beam. The beam has also a hook in its forward end, to which to attach any propelling-power.

This drain-plow or mole-ditcher may be moved by any adequate power; but it is contemplated that it shall be adapted to be moved by the power of a stationary capstan, or, rather, by the power of a capstan that shall be stationary while in use, but subject to be removed from time to time, as occasion shall require.

My object in using the transverse piece is to furnish guides for the ropes or chains of the capstan in moving the plow to the right or left, as the inclination of the ground or the presence of any obstruction may require.

When it is desired to move the plow in a right line the power may be attached to the end of the beam, and whenever it is desirable to give a curvilinear direction to the plow I change the direction of the forward colter, *a*, in the manner before stated, and attach the rope to the link at *f* on the beam on the side of it from which the edge of colter *a* is turned, and then pass the rope through one of the slots in the transverse piece, near to or remote from the beam, according to the radius of the curve which it may be desired to make in the direction of the plow.

It is obvious that the capstan should be placed somewhat in advance of this plow, and that a very considerable curve in the direction of the plow may be easily attained by changing the direction or inclination of the colter *a*, and by attaching the draft-rope to the ring or link at *f*, and passing it through one of the slots in the transverse piece without changing the position of the capstan, and by passing the rope through the outer of those slots as short a curve as is consistent with a durable ditch will be made. It is obvious, also, that handles may be attached to this plow without departing from the principle of this invention.

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

The sectional mole *e d c*, the colters *a* and *b*, the colter *a* being movable, with their respective loops and joints, in combination with the side draft of the plow from the link or loop at *f* on the side of the beam A, through one of the slots in the transverse piece, for the purpose of giving any desired curvilinear direction to the ditch or drain, when the several parts are arranged and operated together as represented, and substantially as described.

In testimony of which invention I hereunto set my hand.

JOHN H. ELWARD.

Witnesses:

MARTIN A. HOWELL, Jr.,

O. LEAVENS.