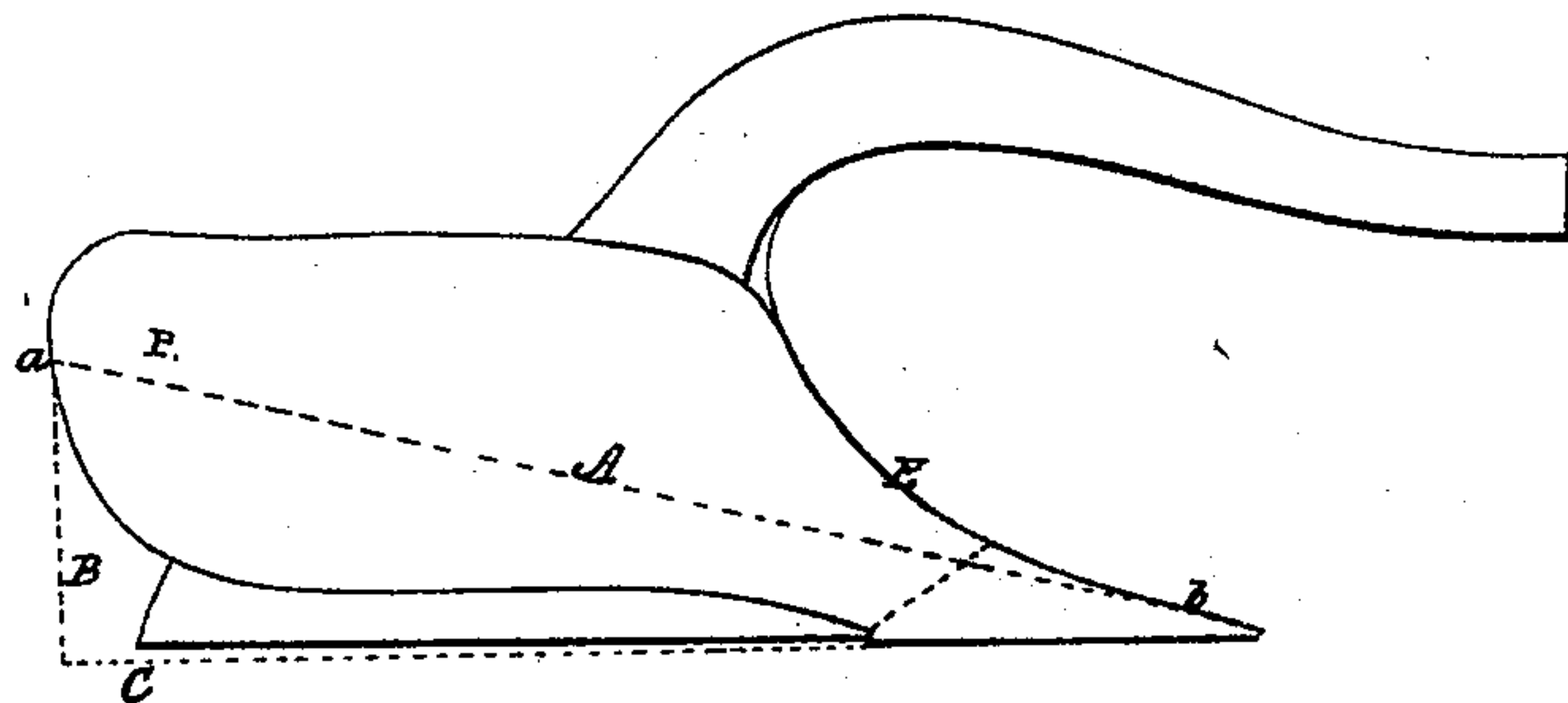


L. P. RIDER.  
Plow-Moldboard.

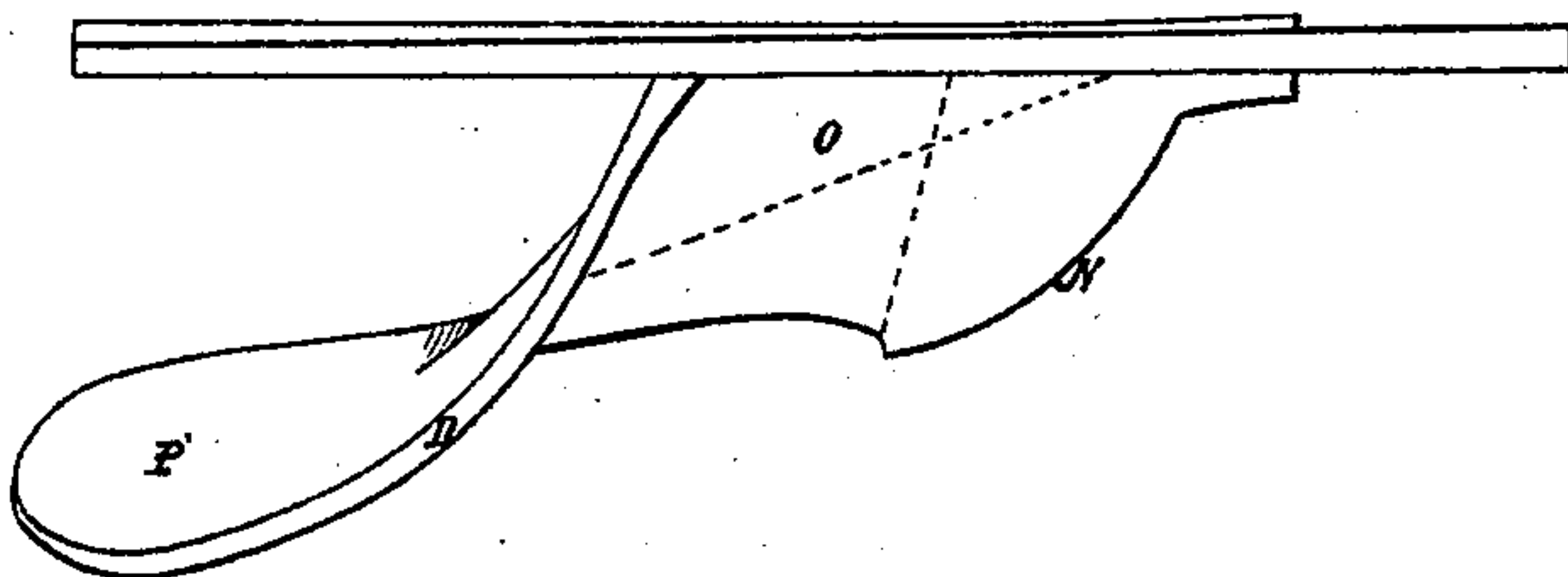
No. 59,267.

Patented Oct. 30, 1866.

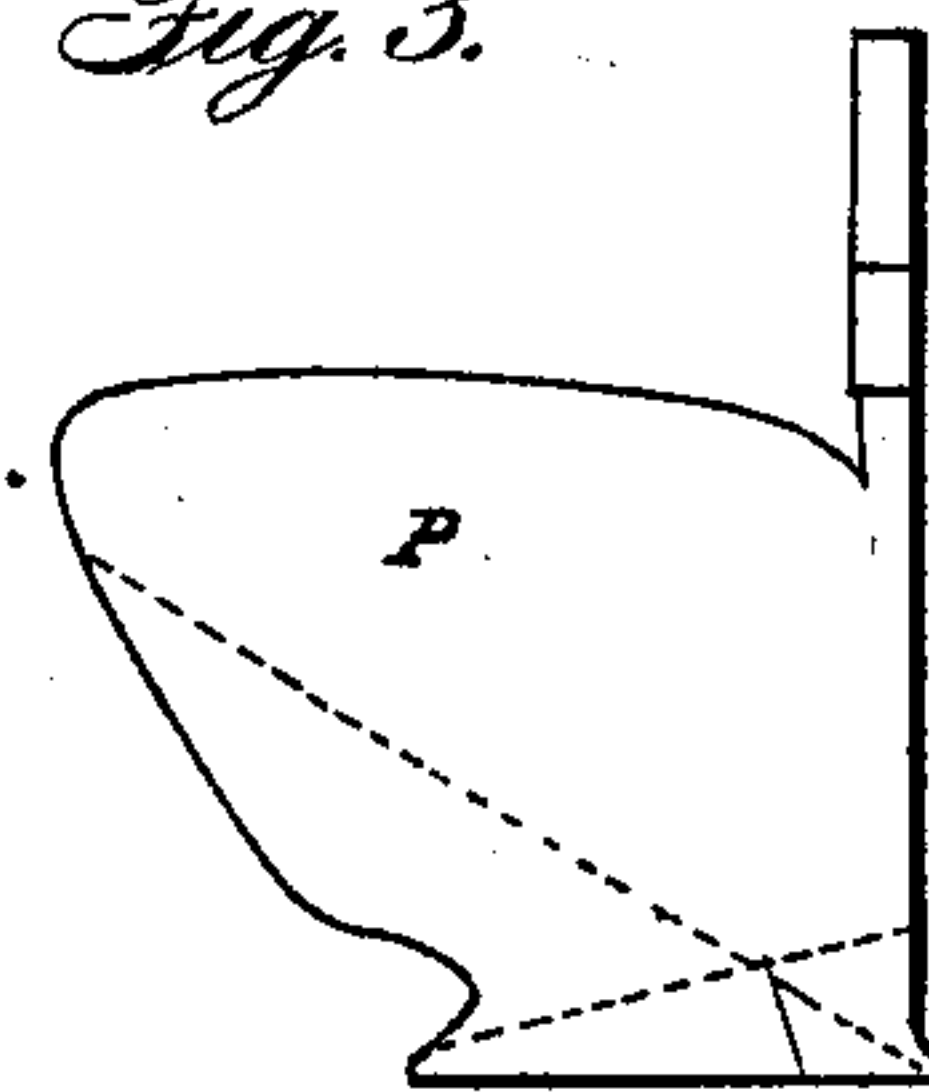
*Fig. 1.*



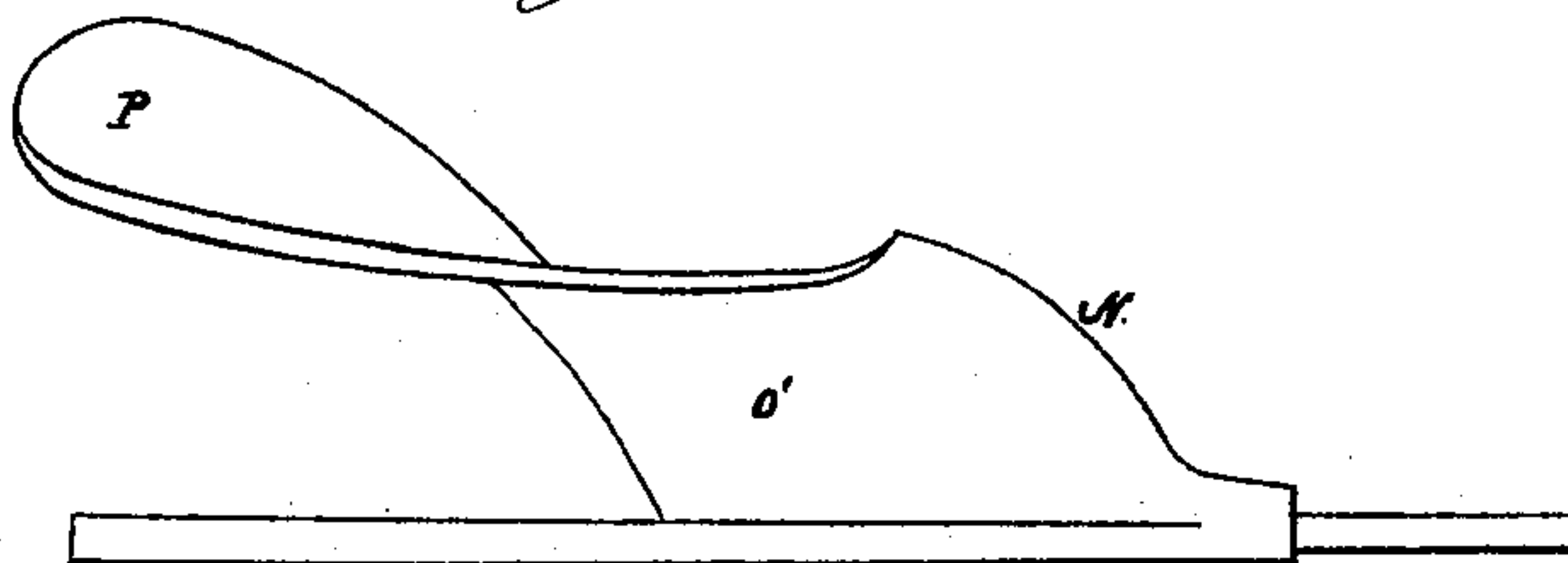
*Fig. 2.*



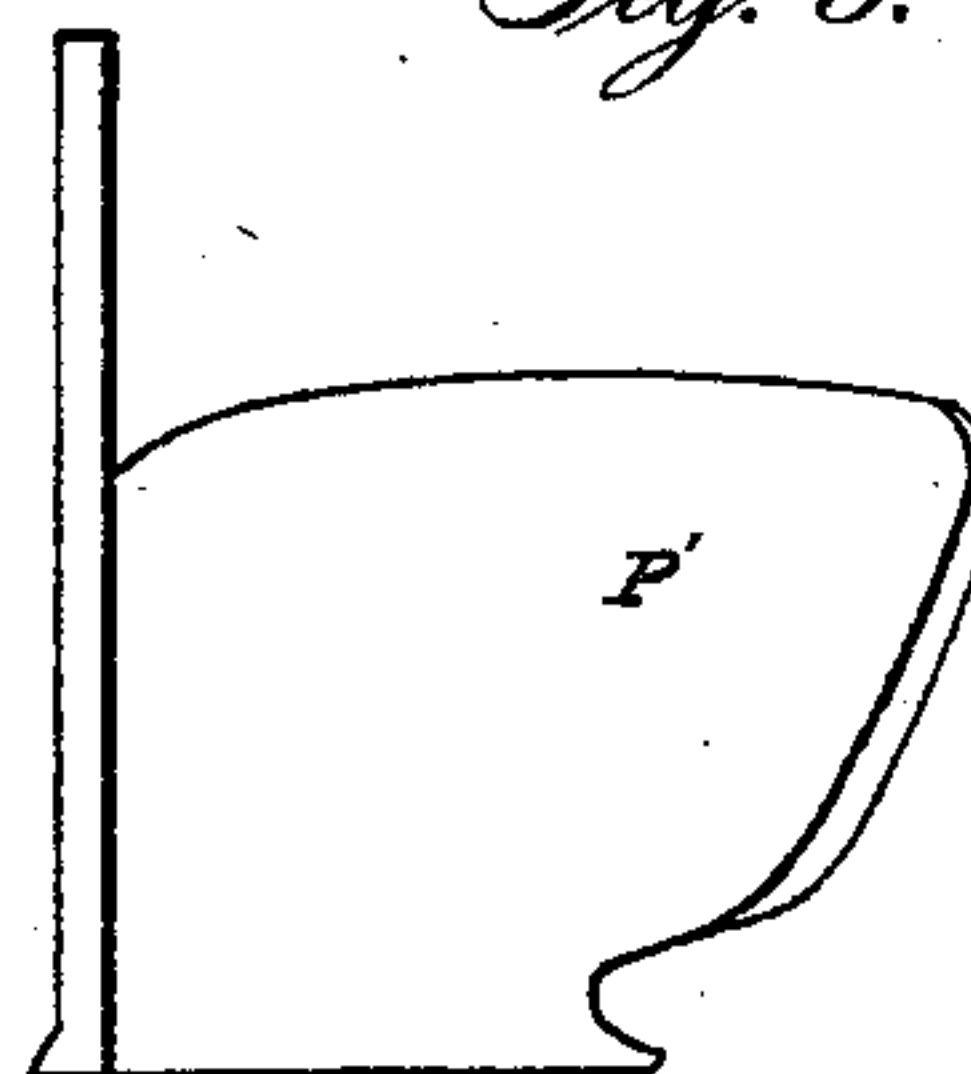
*Fig. 3.*



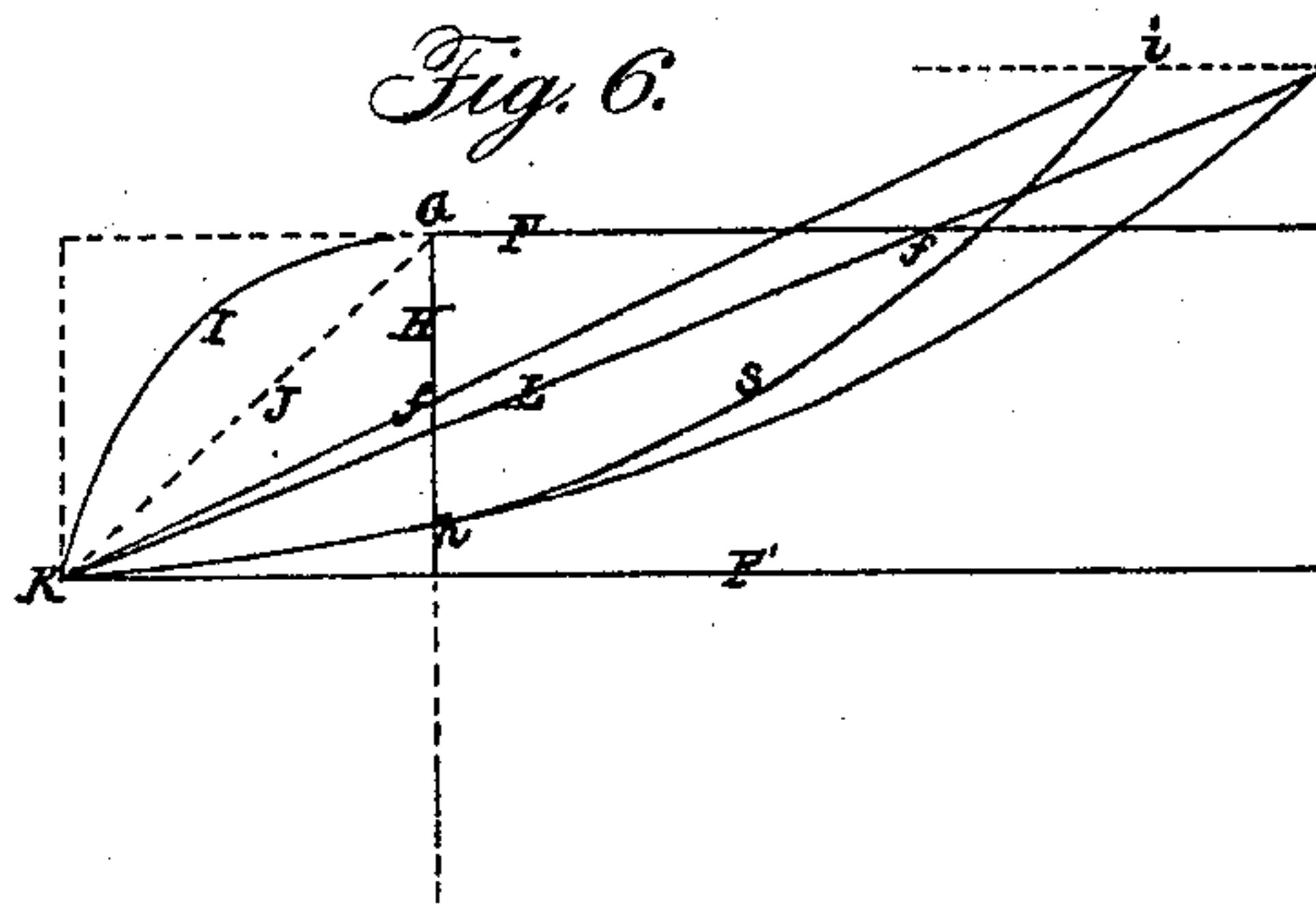
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses:

*J. H. Burridge*  
*E. E. Waite*

Inventor:

*L. P. Rider*

# UNITED STATES PATENT OFFICE.

L. P. RIDER, OF MUNSON, OHIO.

## IMPROVEMENT IN MOLD-BOARDS FOR PLOWS.

Specification forming part of Letters Patent No. 59,267, dated September 30, 1866.

*To all whom it may concern:*

Be it known that I, L. P. RIDER, of Munson, in the county of Geauga and State of Ohio, have invented certain new and useful Improvements in the Mode of Constructing Plow Mold-Boards; and I do hereby declare that the following is a full and complete description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an outside view of the mold-board. Fig. 2 is a top view of the same. Fig. 3 is a front-end view of the mold-board. Fig. 4 is an inside view of the same. Fig. 5 is an end view. Fig. 6 is a diagram.

Like letters refer to like parts in the different views.

The peculiar shape of this mold-board is such that the grade of the board is a true inclined plane from the point to the extreme end of the wing, where the greatest height of the plane terminates, at a point from the ground equal to the width of the plow, which is supposed in this case to be one foot. This inclined plane is indicated by the dotted line A, Fig. 1, and the greatest height by the dotted line B. If this vertical line, which is at right angles with the dotted line C, is carried along toward the point of the plow, with the upper end all the time following the grade of the line A, it will be found to strike the face of the board along the entire length of the line; or should the back of a square be placed against the base-line C, and the tongue of which be allowed to reach the top of the board, and thus moved along, it will be found to strike the entire face of the mold-board, describing the curve D, Fig. 2, the upper edge of the board, and the curve E, the colter-edge, Fig. 1; also, should a straight-edge be laid upon the line A, it will strike the board the entire length of the line, or from the extreme end of the wing at the point *a* to the point *b*. Thus the lifting power of the plow is a true and uniform grade or inclined plane from the point *b* to the point *a*, *a* being the extreme height of the plane. It will be seen by this that the shape of the mold-board is governed by the straight line A—a central inclined plane. This will be illustrated by the diagram, Fig. 6, which is supposed to be a block of wood of the width of the plow, and the edge of which

is of the shape of the figure inclosed by the dotted lines in Fig. 1.

The parallel lines of the diagram F F' represent the sides of the plow, F being the dotted line C in Fig. 1, and F' the line of the land-side. From the point *a* of the diagram, which is the top of the share, and when measured from that point across is the true width of the plow, is drawn the line H, and from some point on this line is described the arc I. The curve of this arc is determined by the length of the diagonal line J, which experience has shown should exceed in length the width of the plow about one-fourth for ordinary plowing. In hard stiff soils a larger curve is required; hence the diagonal must be lengthened. Therefore it will intersect the line F' farther from the line H. Whatever the length may be, K is always taken as the point from which to describe the arc, which is drawn from some point on the line H, striking from the point K to the point G; also, K is always taken as the point from which to draw the line L, which line corresponds with the dotted line A in Fig. 1—the central-grade line.

Having thus established the rule of lines by which the shape of the mold-board is obtained, the application of the same is as follows:

First, the corner of the block M is cut down to the line I. This gives the curve of the board at N, Fig. 2. Then all the wood is cut away between the lines L and I and the line F downward to the lower side of the block, or to an edge, carefully preserving the line L, for it being, as above remarked, the central-grade line, and by which the shape of the mold-board is governed. Now, if this cutting has been properly done and the back of a square placed on the line F, and the line H may be supposed to be such square, if moved along in either direction toward the point, if you please, following the dotted line, it will be found to strike both lines L and I, at the same time touching all the board between them, or, in other words, the tongue of the square will rise on the face of the board from line to line; and so, if the square be moved in the opposite direction, still retaining the back of the square against the line F, it will be found to strike the line L and all the board between the lines. At the point where the line L intersects the



line F the square comes to a perpendicular to the base-line of the plow. From this point onward the direction of the curve is changed, and is now outward from the plow, forming the wing or throw of the mold-board.

By this it is discovered that the curving of the board is governed by straight lines—the lines L and F, the line F being the ruling-line, all the board between the point  $x$  and the point being the lifting grade of the plow, as shown at O, Fig. 2, O', Fig. 4, being the opposite side of O, and all the board beyond the point  $x$  being the wing or throw of the plow, (shown at P, Fig. 4,) the opposite side of which is shown at P', Fig. 2.

The distance the wing or throw of the board curves beyond the width of the plow is governed by the depth of the furrow. Should the plow be calculated for plowing in eight inches deep, the throw of the wing is set off at ten inches, allowing two inches for throwing the furrow beyond its vertical position.

Thus far has been described only the section embraced below line A, Fig. 1. The upper section is governed by the same rule of lines by which the lower section has been formed.

Apply the square, as before, allowing it to extend above the line A, and it will be found that the tongue of the square will describe the curve E, Fig. 1, and the curve of the wing D, Fig. 2—*i. e.*, if the back of the square be placed against the dotted line C, Fig. 1, and the tongue allowed to fall on the mold-board, it will follow the curves E and D, at the same time touching the board at all points between them, as above stated.

By this shaped board the lifting of the furrow is on an inclined plane, which is uniform in grade from the point to the end of the wing.

The mold-board thus described is adapted to the plowing of stiff hard soils, requiring sharp and thin plows. Mold-boards for lighter soils are constructed on the same general principle of a central grade, but slightly modified. In order to illustrate the application of the rule to this kind of plow, reference will be again to the diagram.

In light soils it is necessary to shorten the plow in order to obtain a shorter curving of the mold-board. To do this I change the governing-line L, which, as above said, corre-

sponds with the line A in Fig. 1, from a straight into a curved line,  $s$ , by setting off at the point  $f$  the camber  $f h$ , of such length as may be judged the nearest right, and then, by an easy geometrical construction, the center is found, from which a circular arc can be stretched through the three points  $k h i$ . The construction of the mold-board then proceeds as before, carefully preserving the curved line  $s$ , until the same result is produced—*viz.*, that discovered by the use of the square as applied to the base-line C, Fig. 1; or as applied to the line F of the diagram, it will be found to conform to the line of central grade, the grade being in this case more abrupt and shorter, which is the object desired. Hence by this means can be obtained any length of mold-board and of any desirable grade, according to the nature of the soil, at the same time preserving the general principle of the central-grade line.

Of the many advantages derived from this peculiar mold-board, I instance the following:

First, a large reduction of friction on the land-side, also at the heel of the mold-board.

Second, the beam is nearly in a straight line with the land-side; hence the draft of the plow is more direct, thereby avoiding the side draft common to many plows.

By the application of this rule of lines a plow can be constructed to suit any kind of soil, giving to the edge of the plow a position for shaving or scraping, as the nature of the ground may require. It also raises the furrow to its edge without any abrupt changes of direction over a uniform and direct inclined plane, thereby preventing any unnecessary twisting or turning or breaking.

The lifting of the furrow is by the upper curve of the mold-board, so that the purchase or leverage is applied to the land side of the furrow, and is thereby more easily raised or turned from a horizontal to a vertical position.

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

The construction and arrangement of the plow mold-board, in the manner and for the purpose set forth.

L. P. RIDER.

Witnesses:

W. H. BURRIDGE,  
E. E. WAITE.