WITHEROW & PEIRCE.

Plow Moldboard.

No. 1,357. Patented Oct. 5, 1839.

Fig. 1.

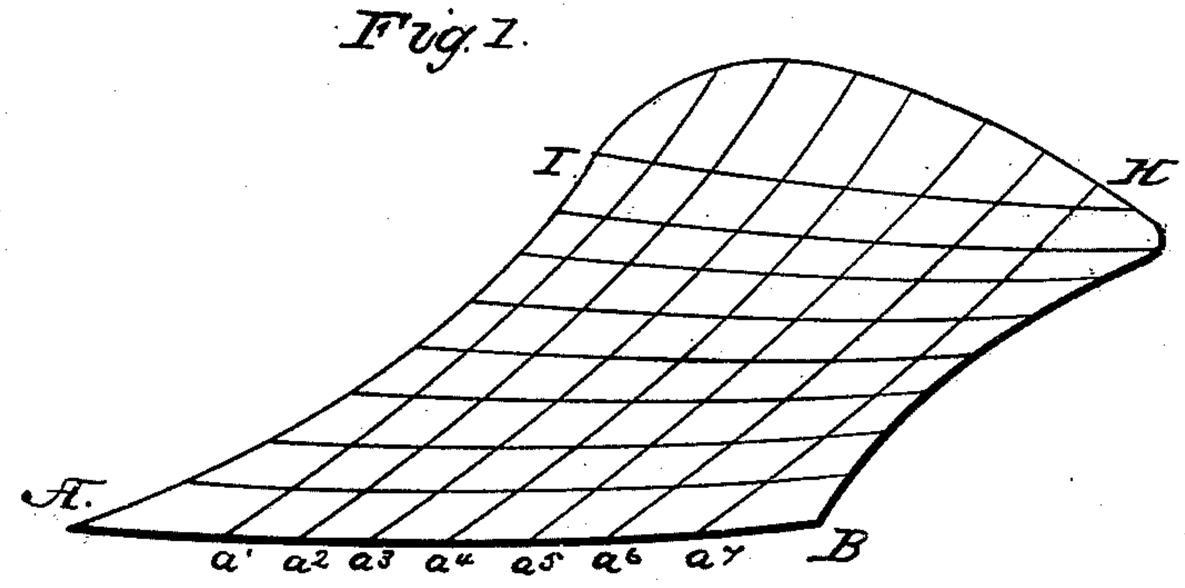
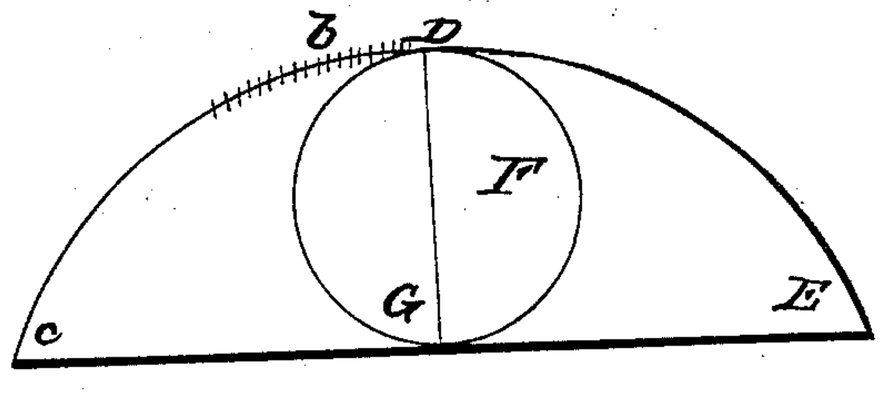


Fig. 2



UNITED STATES PATENT OFFICE.

SAMUEL WITHEROW, OF GETTYSBURG, AND D. PEIRCE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN THE MANNER OF CONSTRUCTING OR FORMING THE MOLD-BOARDS OF PLOWS WHICH THEY DENOMINATE THE "CYCLOIDAL MOLD-BOARD."

Specification forming part of Letters Patent No. **1,357,** dated October 5, 1839.

To all whom it may concern:

Be it known that we, SAMUEL WITHEROW, of Gettysburg, in the county of Adams and State of Pennsylvania, and DAVID PEIRCE, of the city of Philadelphia, in the same State, have invented an Improvement in the Manner of Forming the Mold-Boards of Plows Denominated by us the "Cycloidal Mold-Board;" and we do hereby declare that the following is a full and exact description thereof.

It is a principle resting on mathematical demonstration that a cycloidal arc is that which offers the least resistance to a descending body, and it is hence deducible that an ascending body will pass up a cycloidal curve with less resistance than up any other. The construction of our mold-boards is dependent upon this principle. In forming them we employ the cycloidal curve in two ways—namely, to the formation of the concave of the mold-board in the lines of ascent of the sward or furrow-slice in the act of plowing. The second application of the cycloidal curve is in the convex curve along the sole of the plow, constituting the part which enters and cuts the ground horizontally.

In the accompanying drawings, Figure 1 represents a mold-board, A being its point, and B its heel. The line A B is that of the sole, constituting the lower edge, which cuts the furrow-slice horizontally. This curve in a plow, which has been essayed and has been found to answer well, was generated by a circle of eighteen inches in diameter. In Fig. 2 the curve C D E may represent the cycloid generated by the circle F. The point D, which is that of the least curvature, corresponds with the point A of the plow, Fig. 1, the cycloidal line continuing to the hind part or heel at B. It will no doubt be advantageous to vary this curve according to the nature of the soil—a point to be determined by experience; but whatever variation may be found useful in this respect is still to be made in conformity with the principle upon which we proceed—namely, that of making it cycloidal. The line I H, along the upper part of the mold-board and in a plane parallel to that of the plane of the line A B, we also make to fit the same cycloidal gage.

In the plow which has been put into operation for the purpose of testing the principle, the lines of the ascent of the furrow-slice, which govern the concavity of the mold-board, were regulated by a cycloidal gage made to a curve generated by a circle of sixteen inches in diameter. Let C D G, Fig. 2, represent such a gage, and the lines a' a^2 a^3, Fig. 1, be assumed as those of the ascent of the furrow-slice on the mold-board. In forming said board we place the gage in the direction of the line a', with the part D, which is that of least curvature, at a', and thus proceed on until we arrive at the hinder part, B H, withdrawing or lowering the gage at its lower end at each successive application, so that a smaller portion of the least curved portion toward D and a larger portion of that toward C shall touch the mold-board. These successive depressions may be indicated by the divisions at *b* upon the gage. The degree in which the mold-board shall curve and hang over at H for turning the furrow-slice may be varied according to the judgment of the maker, the curvature being governed by the diameter of the generating-circle and the degree in which the gage is depressed at every successive application of it.

Having thus fully set forth the nature of our invention, and shown the manner in which we carry the same into operation, what we claim therein is—

The giving to our mold-boards the form of a segment of a cycloid convexly on its face in lines leading from front to rear and concavely in the lines of the ascent of the furrow-slice, in the manner and for the purpose herein described.

SAMUEL WITHEROW.
D. PEIRCE.

Witnesses as to signature of S. Witherow:
THOS. P. JONES,
GEORGE WEST.

Witnesses as to signature of D. Peirce:
JOHN THOMPSON,
WM. J. DAVIS.