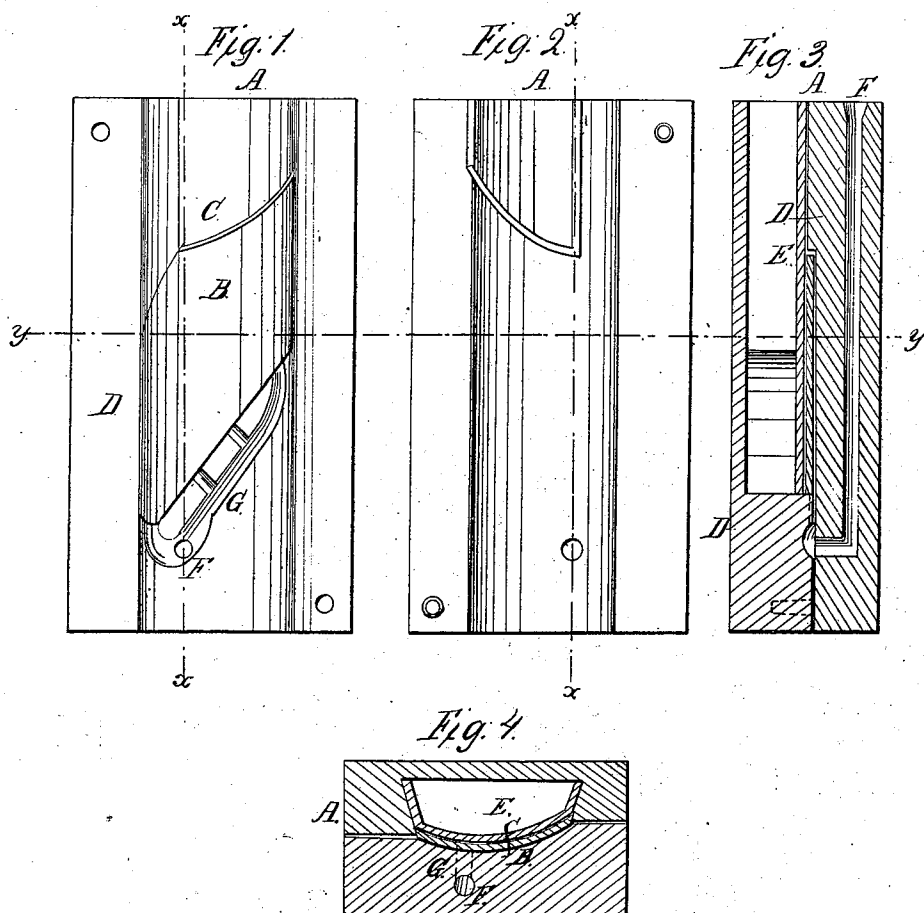


No. 76,652.

PATENTED APR. 14, 1868.

J. OLIVER.
MOLDBOARD FOR PLOWS.



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JAMES OLIVER, OF SOUTH BEND, INDIANA.

Letters Patent No. 76,652, dated April 14, 1868.

IMPROVEMENT IN MOULD-BOARDS FOR PLOUGHS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JAMES OLIVER, of South Bend, in the county of St. Joseph, and State of Indiana, have invented a new and useful Improvement in the Manufacture of Mould-Boards; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and useful process in the manufacture of mould-boards for ploughs, whereby the same are greatly improved as regards their durability, as well as their usefulness; and the invention consists in hardening the wearing-surface or face of the mould-board by chilling it while in the sand-mould, and in treating it afterwards so as to prevent damage from the unequal shrinkage of the chilled and hardened face and the softer back side of the mould-board, and in tempering or carbonizing it to a certain degree, and thereby improving the iron, as will be hereinafter more fully described.

In carrying out my invention, the mould-board-pattern is moulded in the flask with its face resting on an iron chill, and with sand on the other side.

On the back side of the chill there is a chamber for containing water, heated to the boiling-point, so that the heat may be absorbed by the chill.

This chamber is filled from the end of the flask through which its mouth extends.

When the pattern is removed from the flask, and the mould is completed, the flask is set on end, and the sprue is so set, and the mould is so "gated," that the mould receives the melted iron at the bottom or at the end of the mould.

The melted iron consequently rises in the mould, and forces the air and gas before it to the top of the flask, or from the mould, thus preventing the possibility of air-holes being formed, or other defects, on the face of the casting.

In the drawing—

Figure 1 represents one part of the open flask containing the mould-board pattern resting on the chill.

Figure 2 represents the other part of the flask as seen when taken from the pattern, or when the parts of the flask are separated.

Figure 3 is a longitudinal section of figs. 1 and 2 through $x x$.

Figure 4 is a cross-section through the line $y y$.

Similar letters of reference indicate corresponding parts.

A represents the flask or box in which the casting is made. B represents the mould-board pattern. C is the chill. D represents sand in the flask. E is the chamber for hot water. F represents the sprue-hole, into which the melted iron is poured; and G represents the gate or passage-ways, which conduct the melted iron from the sprue-hole to the mould.

After the flask is placed on end, as before stated, and the mould is ready, the chamber is filled with water, heated up to the boiling-point, or thereabouts, and allowed to remain in the chamber in contact with the chill, until the chill becomes more or less heated thereby.

My object in placing water in contact with the chill, as described, is twofold.

In the first place, the chill is thereby sufficiently heated to allow the melted iron to flow smoothly and evenly over it, which gives a smooth and even surface to the face of the mould-board; and in the second place, the water rapidly absorbs the heat from the melted iron by keeping the chill comparatively cool, thereby chilling or hardening the casting to a greater depth than would otherwise be done.

It is well understood the iron chill, where there is much of a body of iron, does not harden or chill the casting entirely through or upon both sides. This fact, as well as the irregular shape of the casting, occasions unequal shrinkage, and a consequent strain, which is sufficient, in many cases, to destroy the casting by warping or cracking.

Were the mould-boards, when cast as we have described, either left in the flasks to cool, or taken therefrom and exposed to the atmosphere, more or less in number would be ruined from the cause mentioned.

To prevent damage, and to temper and toughen, and consequently improve, the texture and quality of the iron, I place the mould-boards, while red hot, in an oven, upon a bed of burning charcoal, or dry, hot sand, omitting the charcoal.

The mould-boards are placed in a pile on the bed of charcoal, in convenient numbers, and the pile is covered with charcoal, and then the charcoal-covered pile is covered with dry, hot sand, or dry, hot sand may be used without the charcoal.

From this pile the atmosphere is excluded by covering the oven with plates of iron, or otherwise, and luting the cracks, or otherwise excluding the air. In this condition the mould-boards are left for twenty or thirty hours, more or less.

The moderate heat to which the mould-boards are thus subjected does not anneal or soften the chilled surface, while the gradual cooling prevents all damage or danger from unequal shrinkage.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent—

The mould-board B, annealed as set forth, as a new article of manufacture.

JAMES OLIVER.

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