G. K. SMITH.

Casting Chilled Mold-Boards, &c.

No. 161,169. Patented March 23, 1875.

Fig. 1.

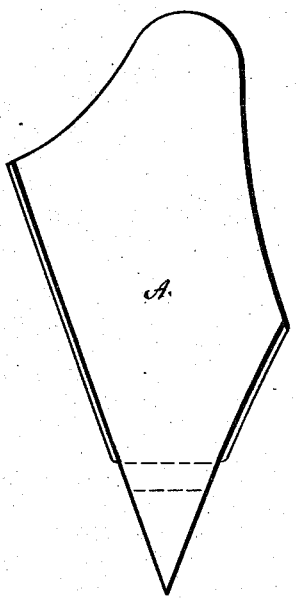


Fig. 2.

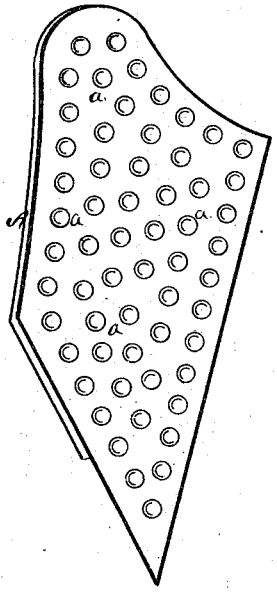


Fig. 3.

Fig. 4.

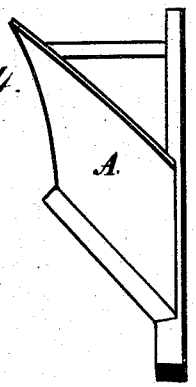
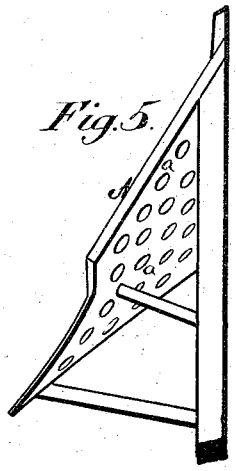


Fig. 5.



Witnesses.
M. Gardner
Edw. W. Dorn

Inventor.
George K. Smith
By J. B. Woodruff Atty

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

GEORGE K. SMITH, OF WATERLOO, IOWA.

IMPROVEMENT IN CASTING CHILLED MOLD-BOARDS, &c.

Specification forming part of Letters Patent No. **161,169**, dated March 23, 1875; application filed January 11, 1875.

To all whom it may concern:

Be it known that I, GEORGE K. SMITH, of Waterloo, in the county of Black Hawk and State of Iowa, have invented a new and useful Improvement in Casting Mold-Boards for Plows, and for other purposes, of which the following is a full, clear, and exact description, reference being made to the accompanying drawings.

The object of my invention is to prevent chilled castings from either warping or cracking in cooling off, so that the perfect form of the pattern may be retained, while one side of the plate may be hard, so as to be highly polished and durable, while the other and unchilled side will be soft, slightly elastic, and tenacious, thus preventing the hard, brittle side from being broken.

My invention consists in making a series of circular concave depressions on the inside of the pattern of the mold-board or plate that is to be chilled, in such a manner that, being distributed evenly over the surface, at least one-half of the metal on the side thus indented is left out of the plate in the casting.

In giving a further description, reference may be had to the drawings.

Figure 1 represents the face or chilled side of the mold-board. Fig. 2 represents the inside of the mold-board, showing the circular concave depressions. Fig. 3 shows an edge view of the same. Fig. 4 shows the top view of the plow-point. Fig. 5 shows the under side of the same.

The mold-boards of plows used in the rich soil of the western prairies require to be highly polished to prevent the soil from adhering to their surface, and increasing the draft. To meet this requirement hardened-steel plows have been used; but these are very expensive, and, moreover, are liable to break. Chilled cast-iron plows have been made at a much less cost, which, when the mold-boards are ground and polished, are fully equal to the tempered steel plows. But the difficulty of casting the mold-boards with one side hard for wear, and the other side soft, slightly flexible, yet tenacious, so as to give them sufficient strength without their warping out of shape or cracking the casting in cooling off, has been very great, as the chilled side of the plate contracts about twice as much as the soft side.

By making a series of circular concave depressions, *a a*, on the under side, so as to take out one-half of the soft metal, the plates A will cool off without cracking or warping out of their proper shape.

I am aware that elongated grooves arranged over a part of the unchilled surface are not new; but

What I claim as my invention is—

A series of circular concave depressions in the plates, mold-boards, or other castings, evenly distributed over the entire side, opposite the face to be chilled, substantially as and for the purpose herein shown.

In testimony whereof I hereunto subscribe my name.

GEORGE K. SMITH.

Witnesses:

GEO. W. MILLER,

HENRY BARDEN.