J. OLIVER.
Chilled Plow-Point.

No. 217,898. Patented July 29, 1879.

Fig. 1.

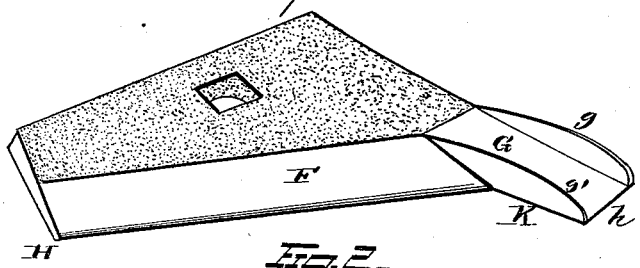


Fig. 2.

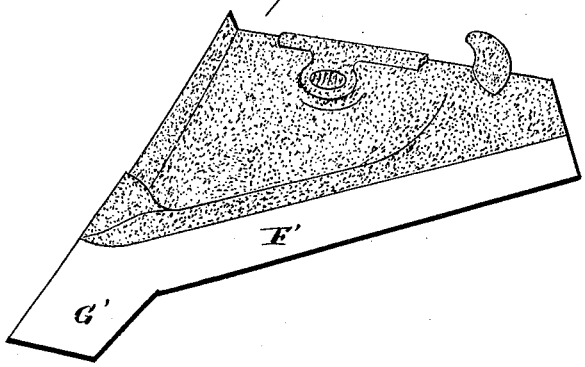
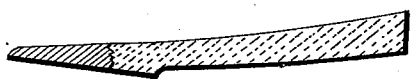


Fig. 3.



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JAMES OLIVER, OF SOUTH BEND, INDIANA.

IMPROVEMENT IN CHILLED PLOW-POINTS.

Specification forming part of Letters Patent No. **217,898**, dated July 29, 1879; application filed June 26, 1879.

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 certain new and useful Improvements in Chilled Plow-Points; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in chilled plow-points.

Heretofore plow-points have been made with their main or body portions cast in sand and chilled on the under face of the nose and edge of the plow-point. While plow-points of this construction were found far superior to unchilled plow-points, yet these were found to be defective in the following particulars: In casting, the chill was placed in the sand and located to form the surface of the mold at the under face of the edge and nose of the plow-point. As the molten iron was run into the mold that portion in contact with the chill cooled more rapidly than the portion in contact with the sand, and, as but little metal is disposed in the comparatively thin sharp edge of the plow-point, the under face of the plow-point contracted more rapidly and to a greater extent than the upper or soft-metal edge, which resulted either in warping the edge or subjecting the metal to such strain, owing to the unequal tension exerted on opposite faces of its wearing-edge, that plow-points of the construction described were often broken by a comparatively slight blow.

The object of my invention is to obviate the defects above noted, and provide plow-points with the upper and under surfaces of the edge and nose of the point chilled to insure a perfectly straight and polished wearing or cutting edge to the plow-point.

It will be observed that when both surfaces of the edge of the plow-point are formed in contact with chill-molds the metal forming the upper and lower surfaces of the edge will cool evenly, uniformly, and simultaneously, and hence counteract any tendency toward warping or undue tension caused by the unequal tension caused by the unequal contraction of the metal. Hence it is that a plow-point having the opposite surfaces of its edge and nose chilled is thereby furnished with a perfectly straight and even cutting-edge, and also possesses greater strength and durability, as all uneven strain on different portions of the point is obviated.

My invention consists in a plow-point constructed with its body portion unchilled and its edge and nose chilled on opposite sides.

In the accompanying drawings, Figure 1 is a view in perspective of the upper surface of my improved plow-point. Fig. 2 is a similar view of its under side or surface; and Fig. 3 is a transverse section of the same.

In the casting of chilled plow-points embodying my improvement, the chill for the under surface of the edge and nose of the plow-point is first placed upon a follow-board with the chilled surface upward. A pattern conforming in shape and size to the plow-point to be cast is placed on the follow-board, the lower surface of the edge and nose of the pattern resting upon the upper surface of the chill. Then upon the upper surface of the edge and nose of the pattern is placed another chill. The drag is then placed over the follow-board and the pattern packed with sand. A bottom board is then secured to the drag, and the latter turned over to rest upon its bottom board. The follow-board is then removed, and parting-sand is then shaken over the chill and pattern.

The cope of the flask is then placed over the drag, pattern, and chills, and the sprue put in its proper place. The cope is then packed with sand, the sprue removed, and the cope lifted from the drag. The chill for the under surface of the edge and nose of the plow-point is then removed, and afterward the pattern is removed, and the lower chill replaced over the upper chill. The cope is then returned to its place, and the flask clamped ready for pouring. When the metal is poured it flows between the opposing faces of the two chills, which latter operate to chill the upper and lower surfaces of the edge and nose of the plow-point. As the opposite sides of the edge of the plow-point are cooled uniformly and simultaneously, all tendency of the metal to warp or crack by reason of unevenness or strain is obviated, and a perfectly straight and polished chilled surface is im-

parted to the opposite surfaces of the nose and edge of the plow-point.

In order that the shape of the edge and nose of the plow-point may be made in exact conformity to the pattern, it is necessary that the chills be prevented from warping or twisting, due to the uneven contraction and expansion of the face and back of the chill.

Should both chills become warped to any considerable extent in cooling, they would operate to bind the edge of the plow-point, which latter, as has been observed, will, if not subjected to some other outside force, come out of the molds perfectly straight and uniform in all its parts.

To prevent any possibility of bending the chilled edge of the plow-point, one of the chills, preferably the upper chill, is made up of a number of independent sections attached to a strip by rivets or otherwise, the sections being arranged to form a narrow intervening space between each section, said spaces not being of sufficient width to allow of the escape of the molten metal, but, on the other hand, operating to admit of the contraction and expansion of the several sections independently of each other, and also to form vents for the ready escape of any gases generated in casting, and thus prevent the formation of blow-holes or blisters in the completed plow-point.

The chill made in sections, as set forth, cannot become unduly warped, as the metal composing the chill is subdivided into a number of sections, and thereby prevented from contracting and warping the chill throughout its entire length, as would be the case were the chill made solid without joint or opening.

The general description above given of the process resorted to in the manufacture of my improved plow-points is embodied herein, to impart such information to the public as will give a clear idea of the difficulties that have been encountered in producing my improved article, and the manner in which these difficulties have been met and obviated.

I would have it understood that I do not limit myself to any particular apparatus or process in the manufacture of my improved plow-points, and, further, that I make no claim in this patent to any form or construction of apparatus for such purpose, as such subject-matter is embodied and claimed in another application, filed on or about the 24th of June, 1879.

The nose of the plow-point is, preferably, provided with the ribs or flanges *g g'*, which serve to strengthen the nose and allow of the employment of a comparatively thin and sharp nose-blade, *h*. While such strengthening-flanges have heretofore been combined with the nose of a plow-point having its entire upper surface unchilled, the plow-points thus made are practically defective, for the reason that they necessitate grinding to form a sharp cutting-edge on the nose and edge of the point, and the strengthening-ribs seriously interfere and render it impracticable to properly grind the upper surface of the plow-point when furnished with such strengthening-ribs. In the ordinary construction of plow-points the nose is re-enforced in thickness to insure the required strength, and then rounded off toward the share to secure a plain surface that will admit of the grinding of the upper surface of the edge and nose of the plow-point. This requires that the lower surface of the nose shall be carried below the lower surface of the edge of the plow-point; and hence the lower surfaces of the nose and edge are not in the same horizontal plane, which should be the case to provide a perfect and continuous cutting-edge and bearing for the plow-point.

While the construction of plow-point last referred to is deemed necessary in plow-points which require the upper surface to be ground, it is not demanded or required in a plow-point embodying my invention, as I am enabled to provide a thin sharp nose-blade with its strengthening-flanges, for the reason that the upper surfaces of the nose and edge are chilled and smooth, and hence never require grinding, as the smooth polished surface will always wear perfectly smooth and clean.

The upper and lower surfaces, F F', of the edge of the plow-point and G G' of the nose are subjected to an even and uniform chill, which imparts a steel-like, hard, and highly-polished surface to such parts. The extreme edge, H, merges into the lower edge, K, of the nose of the plow-point, and thereby forms therewith a continuous bearing-surface for the edge and nose in the same horizontal plane.

While the construction of plow-point shown in the accompanying drawings is my preferred construction, I would have it understood that I do not limit myself to a plow-point of the exact form and shape shown and described, but consider that my invention includes within its scope any construction of plow-point the body portion of which is unchilled, and chilled on both the upper and under sides of its edge and nose.

Plow points constructed in accordance with my invention are readily distinguishable from any construction of plow-points heretofore produced. The body of the plow-point, being cast in a sand mold, possesses the requisite strength and toughness, and is bordered by a highly chilled and polished surface, which covers the upper and under surfaces of the edge and nose of the plow-point. The chilled portion is clearly apparent to the eye before the point has been subjected to wear, and after the plow-point has been worn the chilled surfaces have the appearance of a polished silver wearing-edge and nose applied to an ordinary plow-point.

It is not desirable to chill the entire plow-point, for the reason that the point is subjected to hard usage and variable strains, and if chilled throughout its entire portion would not possess the required durability and

strength. Again, when the entire upper surface is left unchilled, the thin sharp edge and nose, having a rough and unfinished upper surface, offers undue resistance to its passage through the soil, owing to the great friction of such rough upper surfaces when brought in firm contact with the soil. Such plow-points not only require an unnecessary amount of power to force them through the soil, but also, as an incident of the soft and rough upper surfaces of the edge and nose, such parts are quickly worn away, and require constant resharpening to keep the plow-point in working order.

In my improved plow-point the required strength and durability are retained, as the body portion thereof is left unchilled, and hence possesses the necessary toughness and strength to withstand hard usage. Further, the upper surface of the edge and nose of the plow-point being chilled, and thus highly polished, the resistance of the plow-point when forced through the soil is very much lessened; and, further, plow-points constructed in accordance with my invention require no resharpening or grinding to keep them in order, as the sharp highly-polished chilled edge and nose are of the nature of hardened steel, and do not require grinding to retain the cutting portions in perfect working order.

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

A plow-point having its body portion unchilled and its edge and nose chilled on both upper and under sides, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of June, 1879.

JAMES OLIVER.

Witnesses:

HENRY A. SEYMOUR,

FRANK O. MCCLEARY.