

J. OLIVER.
Chill-Mold.

No. 217,815.

Patented July 22, 1879.

Fig. 1.

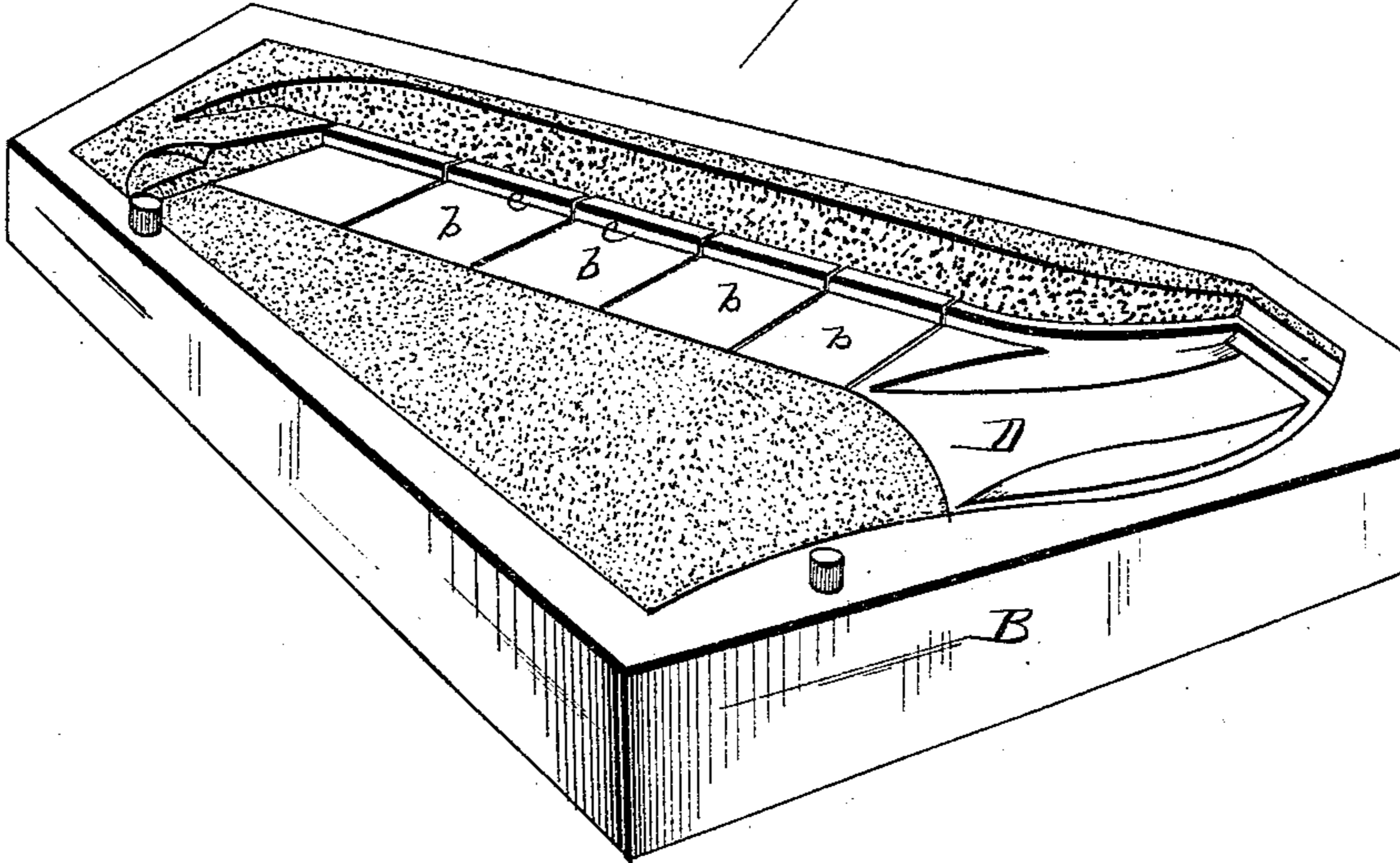
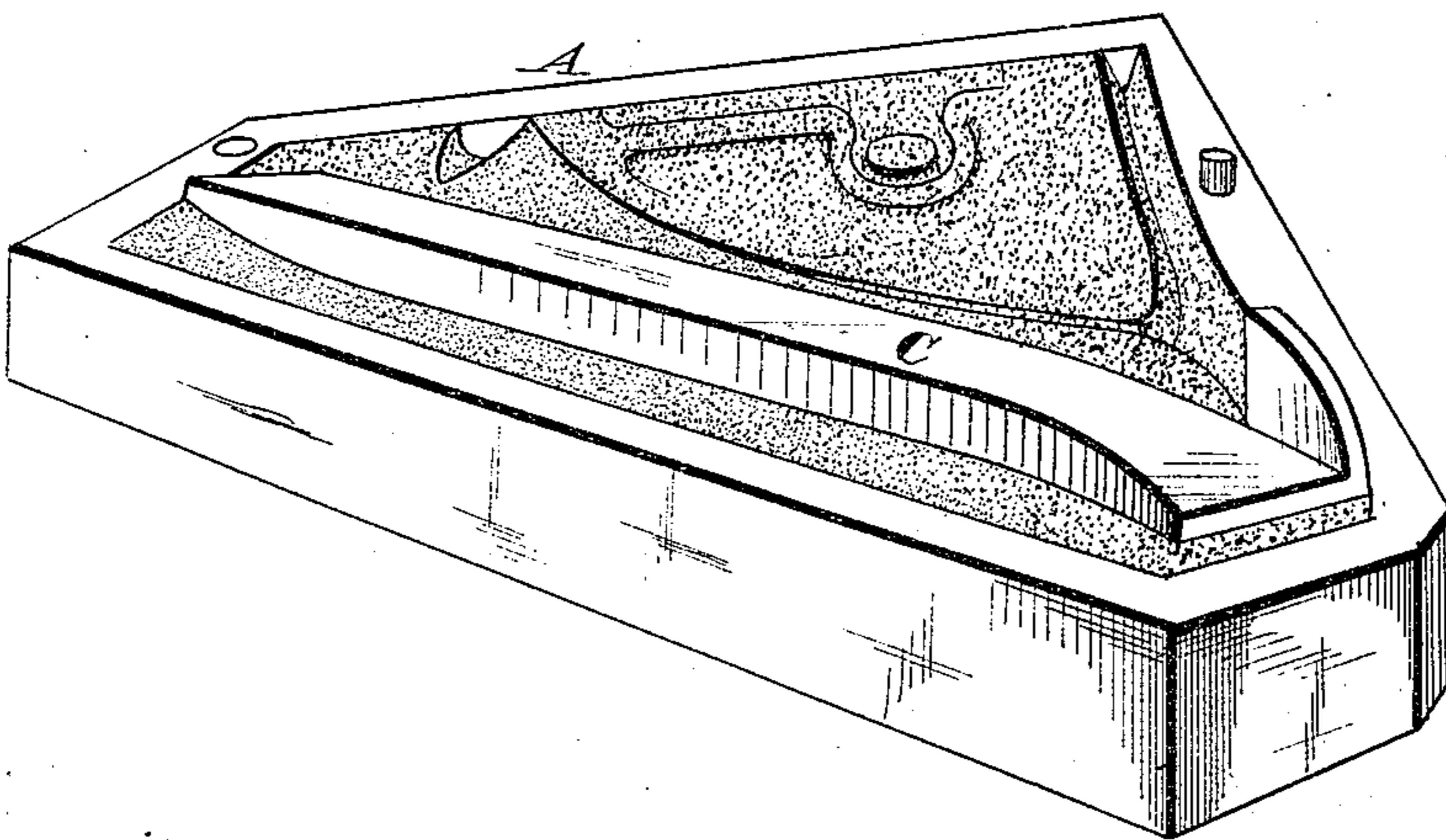


Fig. 2.



WITNESSES
E. J. Nottingham
A. M. Bright

INVENTOR
James Oliver.
Robert A. Seymour.
ATTORNEY

J. OLIVER.
Chill-Mold.

No. 217,815.

Patented July 22, 1879.

Fig. 3.

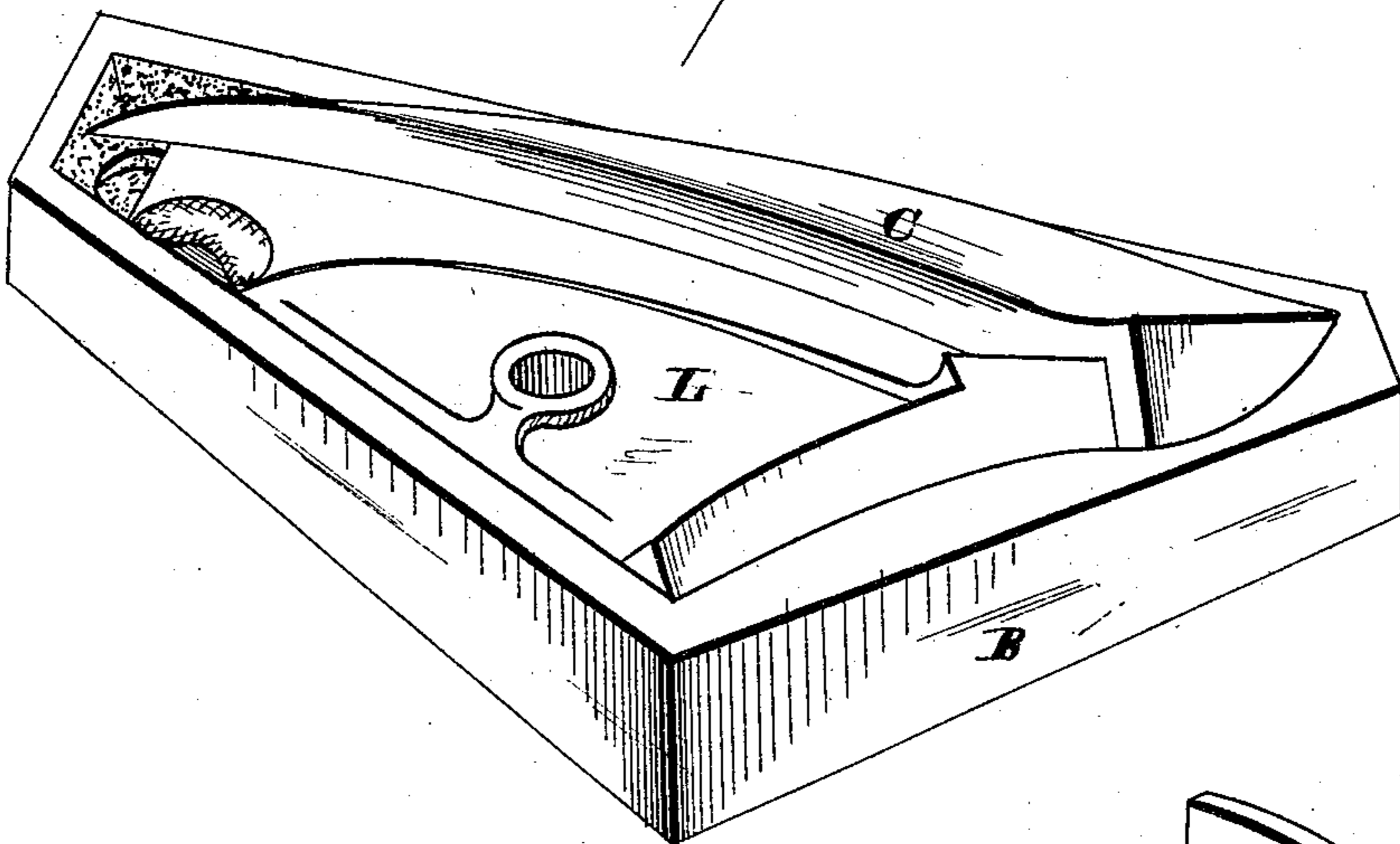


Fig. 4.

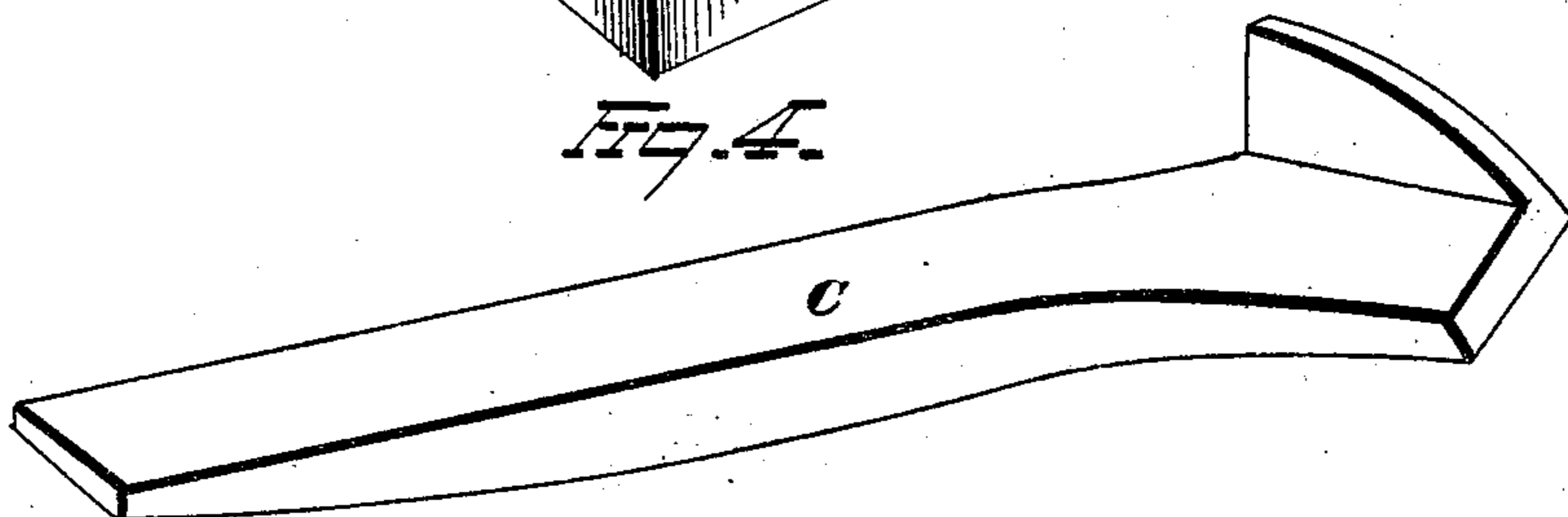
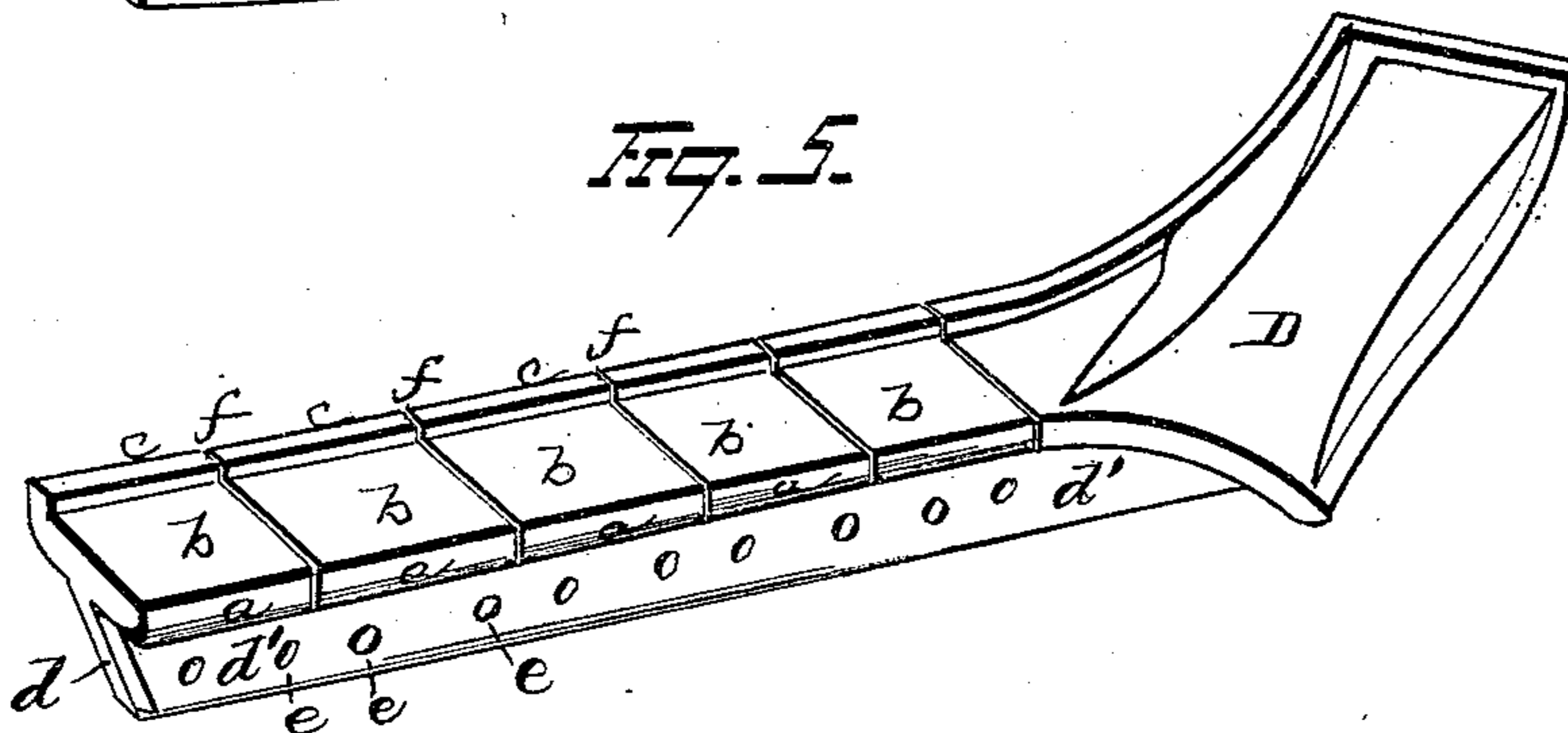


Fig. 5.



WITNESSES

E. J. Nottingham
Am. Bright.

INVENTOR

James Oliver.
By H. A. Seymour.
ATTORNEY

J. OLIVER.
Chill-Mold.

No. 217,815.

Patented July 22, 1879.

Fig. 6.

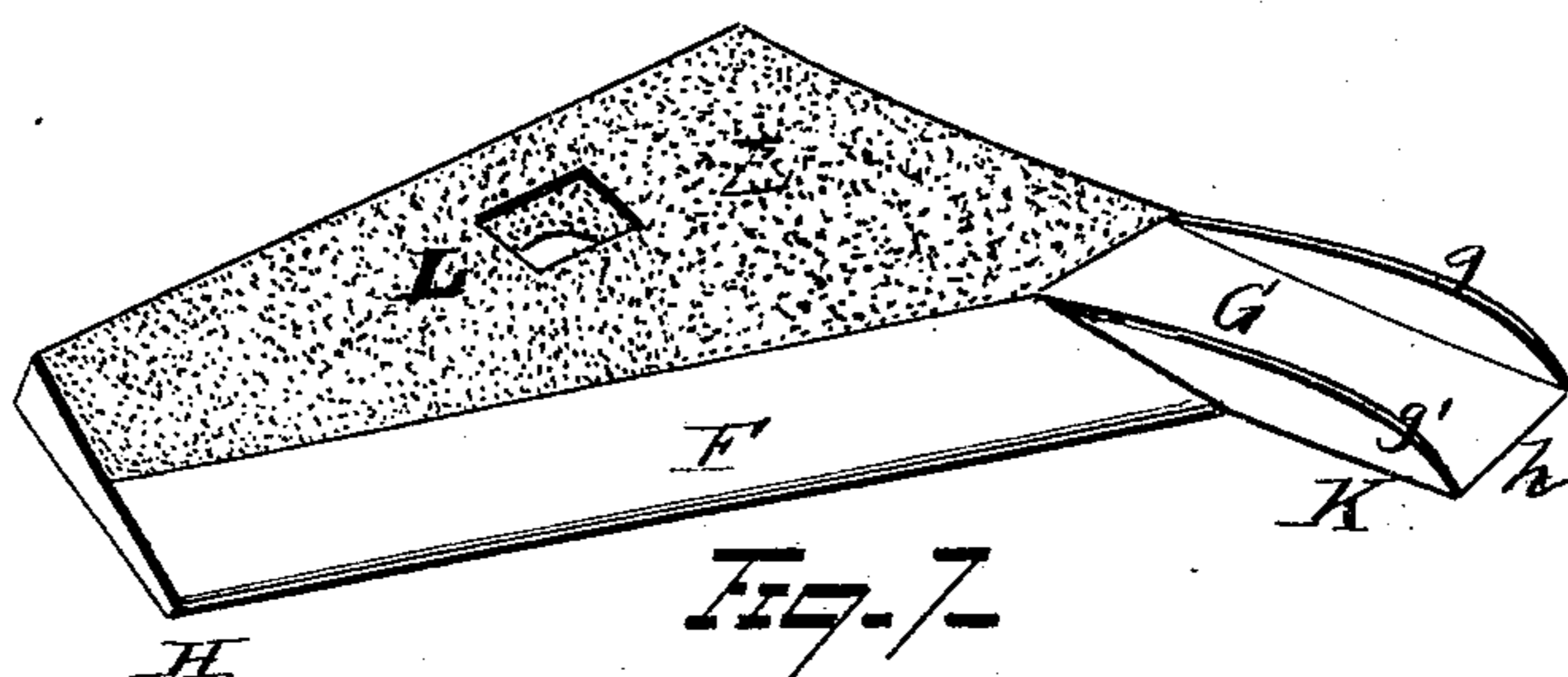


Fig. 7.

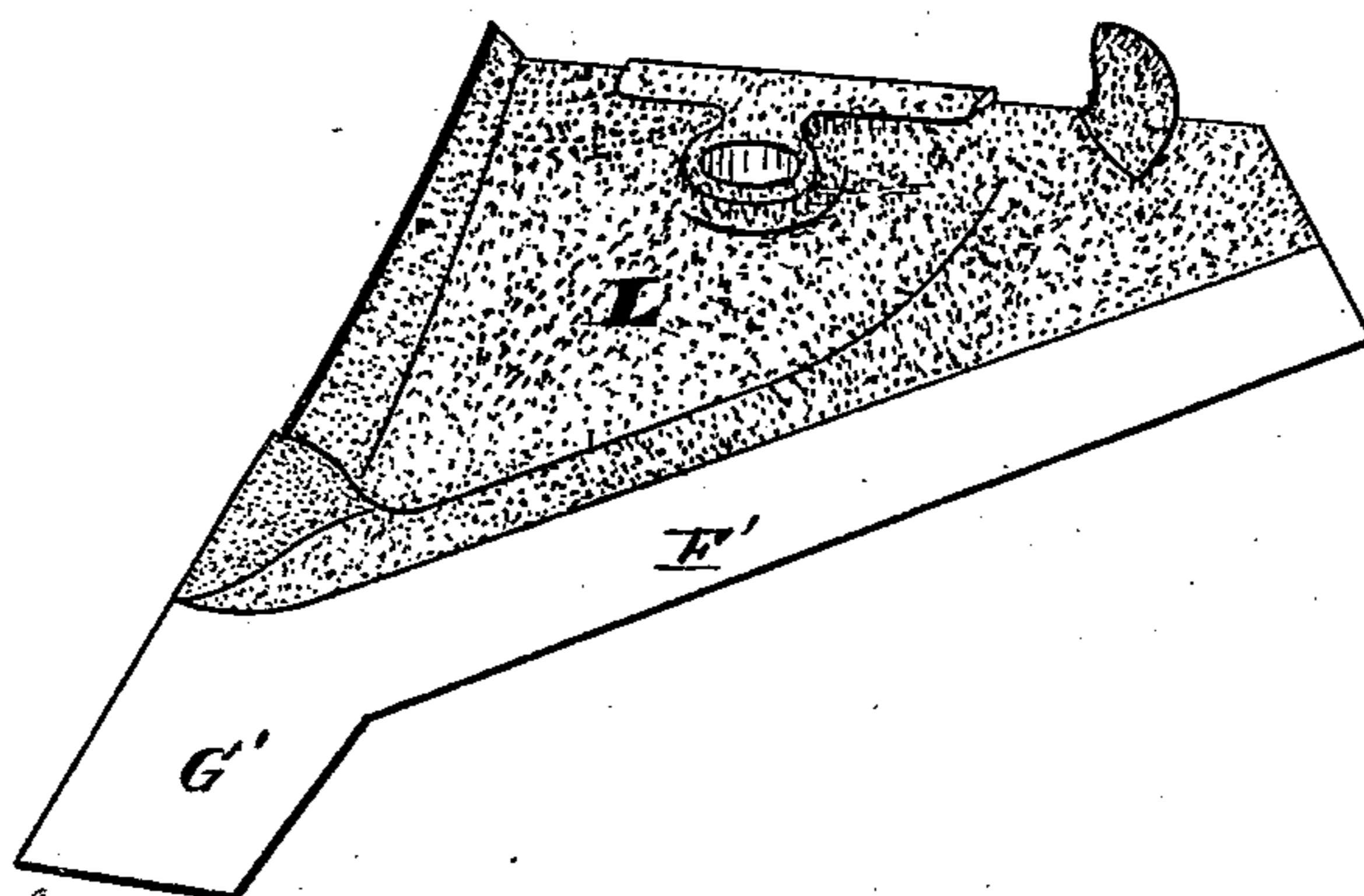
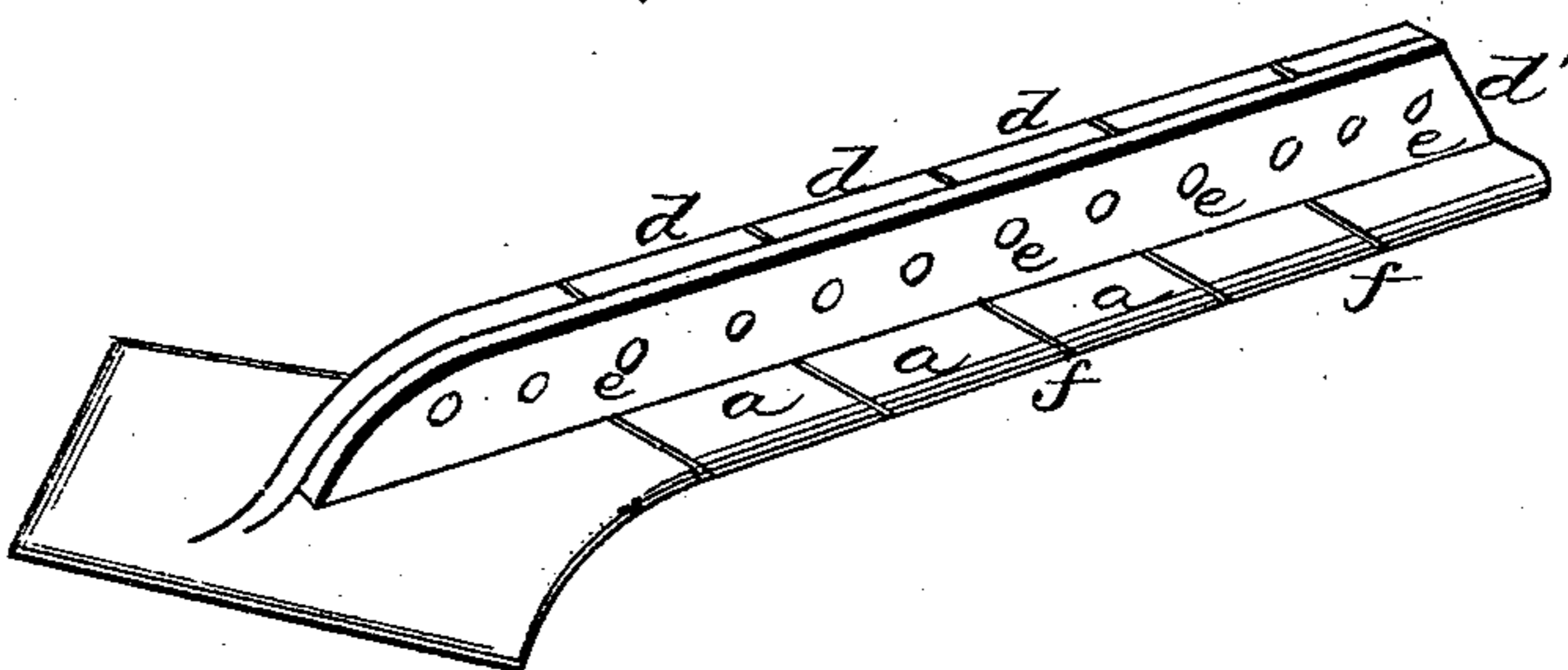


Fig. 8.



WITNESSES

E. J. Nottingham
A. M. Bright

INVENTOR

James Oliver.
By H. A. Symmon.
ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES OLIVER, OF SOUTH BEND, INDIANA.

IMPROVEMENT IN CHILL-MOLDS.

Specification forming part of Letters Patent No. **217,815**, dated July 22, 1879; application filed June 24, 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 Molds for 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 molds for chilling plow-points.

Heretofore plow-points have been made with their main or body portions cast in sand and chilled on the underface of both the nose and the 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 opposite 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 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, first, in the combination, with a sand-mold for forming the body portion of a plow-point, of two chills for the nose and edge only, one adapted to the upper and one to the lower surface of the nose and edge of a plow-point, for the purpose of producing plow-points with their body portions unchilled, strong, and tough, and with highly-polished chilled upper and lower faces on the edge and nose of the point.

My invention further consists in the combination, with a sand-mold for forming the body portion of a plow-point, of two chills for the nose and edge only, one or both of the chills having vented faces, one chill adapted to the upper and one to the lower surface of the nose and edge of a plow-point, for the purpose of producing plow-points with chilled surfaces on the upper and lower faces of the edge and nose, and preventing the formation of blisters or blow-holes in such chilled portions.

My invention further consists in the combination, with a sand-mold for forming the body portion of a plow-point, of two chills for the nose and edge only, one of said chills being solid and the other sectional, said chills being constructed to impart a chilled surface to the upper and lower faces only of the nose and edge of a plow-point, for the purpose of producing the chilled edge of the point without warping or bending, and causing each point to come from the chill with a perfectly straight and smooth edge chilled on opposite faces thereof.

In the accompanying drawings, Figure 1 is a view, in perspective, of the drag, having the chill for the upper surface of the edge and nose of the plow-point placed therein. Fig. 2 is a similar view of the cope provided with a chill for the under surface of the edge and nose of the plow-point. Fig. 3 is a view, in perspective, of the drag, showing the plow-point after it has been cast, the chill not having been removed from the drag. Fig. 4 is a view, in perspective, of the chill for the under surface of the edge and

nose of the point; Fig. 5, a similar view of the chill for the upper surface of the edge and nose of the plow-point, and Figs. 6 and 7 are perspective views of the upper and lower surfaces of the plow-point. Fig. 8 is a view, in perspective, of the rear side or edge of the chill for the upper surface of the edge and nose of the plow-point.

A represents the cope, and B the drag. C is the chill for the under face of the edge and nose of the plow-point. Chill C is first placed on the follow-board, which latter is ordinarily employed to facilitate the operation of casting, and may be made of wood or other material which will retain the form or shape imparted thereto, built up on a board so that its upper surface, in this instance, will be in exact conformity to the rear edge of the chill for the under surface of the nose and edge of the plow-point and to the body or unchilled portion of the under side or face of the plow-point. When the chill is placed on the follow-board a view of the latter will appear like Fig. 2, with the exception that the portion representing sand would be represented as made of wood or equivalent material. Then 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 surface of the chill C. Then upon the upper surface of the edge and nose of the pattern is placed the chill D. The drag is then placed over the follow-board and pattern and packed with sand. A bottom board is then secured thereto, and the drag then turned over to rest upon its bottom board. The follow-board is then removed, and parting-sand shaken over the chill and pattern. The cope of the flask is then placed over the drag and pattern and chills. The sprue is then put in its proper place. The cope is then packed with sand, the sprue removed, and the cope lifted from the drag, the chill C removed, and afterward the pattern is removed. The chill C is then placed over the chill D, and the gate is cut. The cope is then returned to its place. The flask is then clamped ready for pouring.

When the metal is poured it flows between the opposing faces of the two chills C D, 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 imparted 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 C D become warped to any considerable extent in cooling they would operate to bend 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 chill D) is made up of a number of independent sections, *a*, each of which is formed with a chilling-face, *b*, and a flange, *c*. Sections *a* of the chill are also constructed with projections *d*, by means of which they are secured to the strip *d'* by rivets *e*. It will thus be observed that the chill is composed of any desired number of sections *a*, which are independently secured to a stringer or strip. Between each section is provided a space, *f*, which is not of sufficient width to allow of the escape of the molten metal, and yet serves to allow the several sections *a* to expand and contract independently of each other. The chill made in sections, as described, cannot become unduly warped, as the metal 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. Again, the divisions or openings between the several sections serve as vents for the discharge of any gases generated in pouring the molten metal, and thus the plow-points are not damaged by blow-holes.

If desired, I may use two sectional or divided chills, one on each side or face of the edge and nose of the plow-point; but one chill of such construction, in connection with a solid chill, serves to insure good results.

While I have described one form of construction of sectional chill for the purpose described, I would have it understood that I do not limit myself to such exact construction. The sections may have projections constructed to overlap one another, and thus be secured to each other by rivets, without employing a separate strip. Again, the chill may be cast in single piece, and the back made in one continuous piece, with the face subdivided into any desired number of sections.

It is not necessary to grind the upper surface of a plow-point produced by my improvement in chill-molds, as the upper surface of its edge and nose is chilled and polished, and hence never requires grinding. The highly-polished chilled 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.

A plow-point made in accordance with my invention has other valuable characteristics, which are fully set forth in my application for patent filed June 26, 1879.

I make no claim in this application to the plow-point, as such improvement constitutes

the subject-matter of a separate application for patent, filed June 26, 1879, wherein it is described and claimed.

The description of several features of improvement embodied in the plow-point has been incorporated herein, that the public may appreciate some of the important advantages and results flowing from the employment of the chills herein described, and covered by the following claims.

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

1. In a mold for casting plow-points, the combination, with a sand mold for forming the body portion of the plow-point, of two chills for the nose and edge only, one adapted to the upper and one to the lower surface of the nose and edge of the plow-point, substantially as set forth.

2. In a mold for casting plow-points, the combination, with a sand mold for forming the

body portion of the plow-point, of two chills for the nose and edge only, one or both of the chills having vented faces, one chill adapted to the upper and one to the lower surface of the nose and edge of a plow-point, substantially as set forth.

3. In a mold for casting plow-points, the combination, with a sand mold for forming the body portion of the plow-point, of two chills for the nose and edge only, one of said chills being solid and the other sectional, said chills being constructed to impart a chilled surface to the upper and lower faces only of the nose and edge of a plow-point, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 21st day of June, 1879.

JAMES OLIVER.

Witnesses:

HENRY A. SEYMOUR,
E. I. NOTTINGHAM.