(No Model.) 2 Sheets—Sheet 1.

J. OLIVER & C. ANDERSON.

MOLDING FLASK.

No. 433,361. Patented July 29, 1890.

FIG. 1.

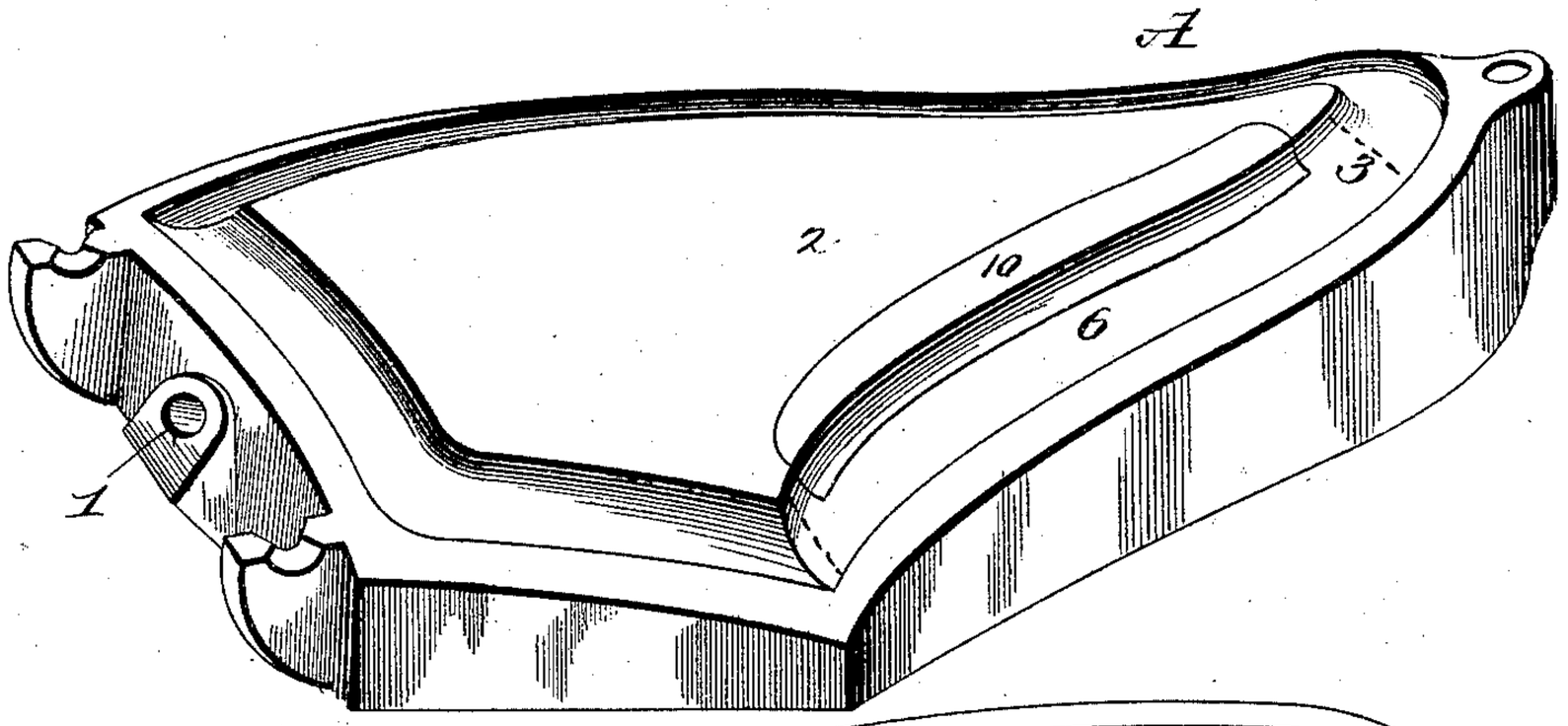


FIG. 2.

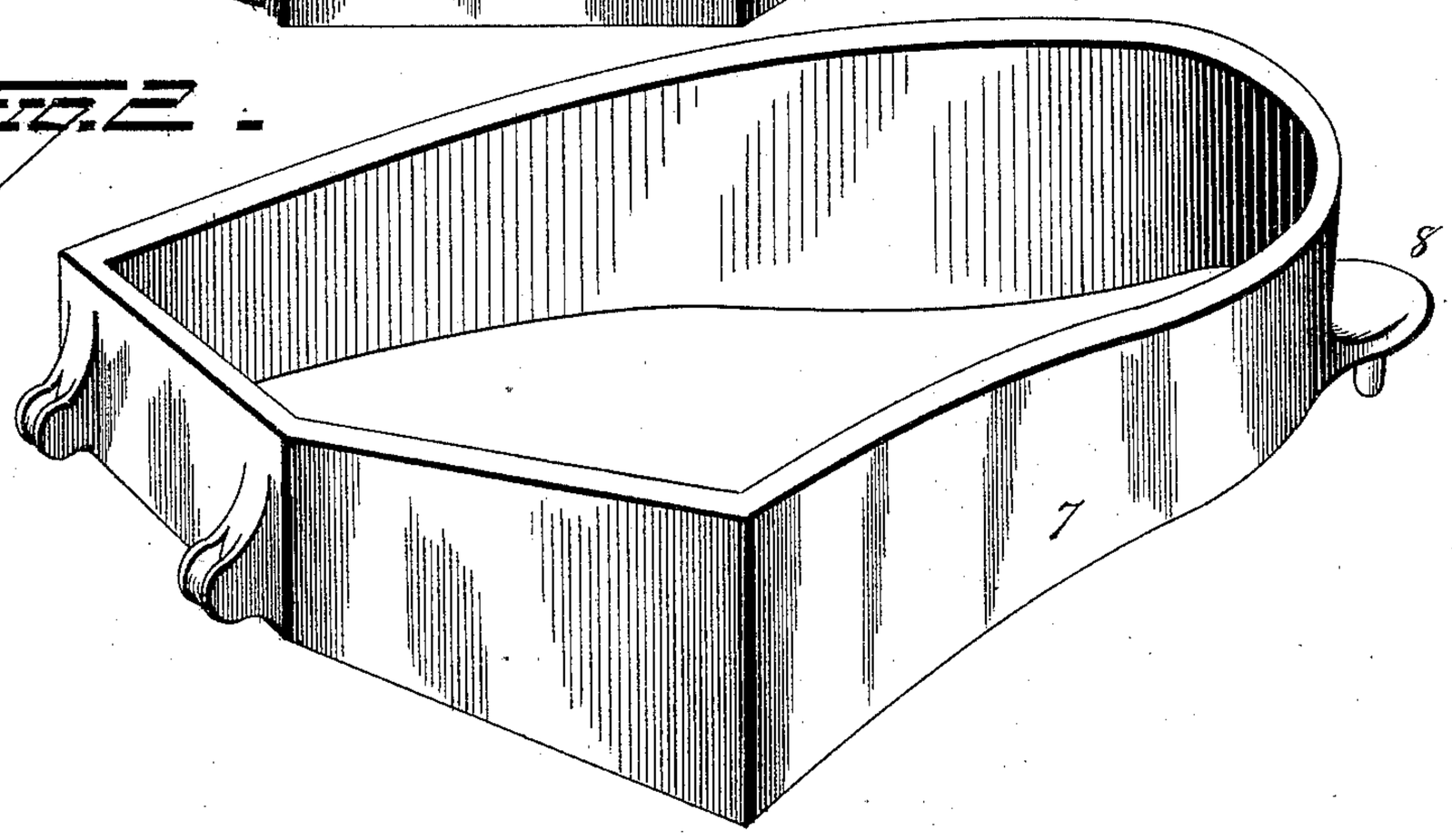
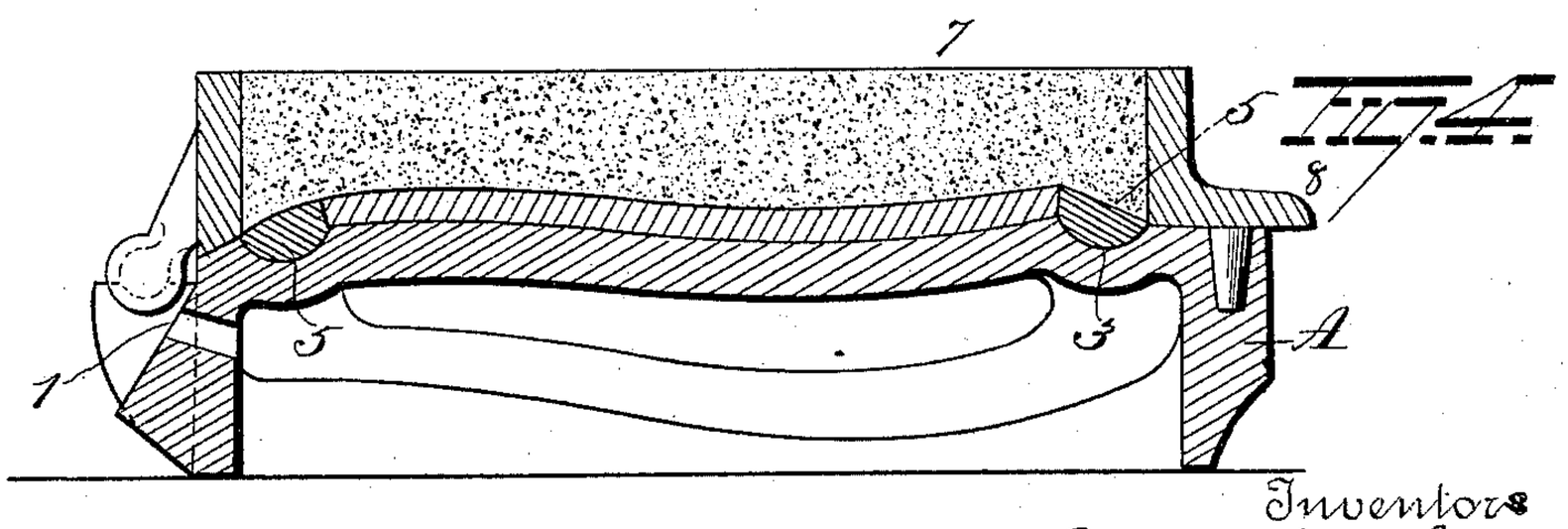


FIG. 4.



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(No Model.) 2 Sheets—Sheet 2.

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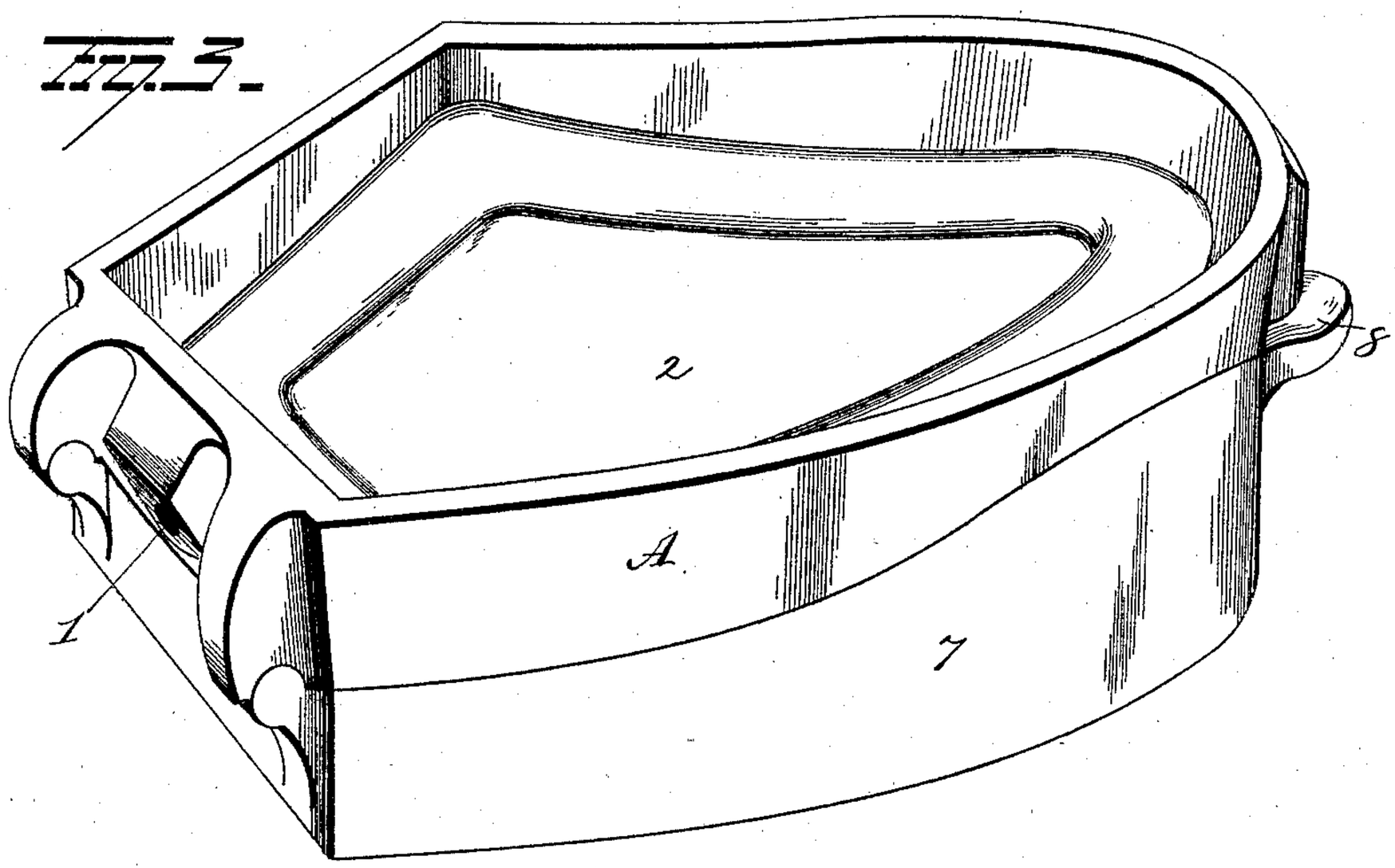
Fig. 3.



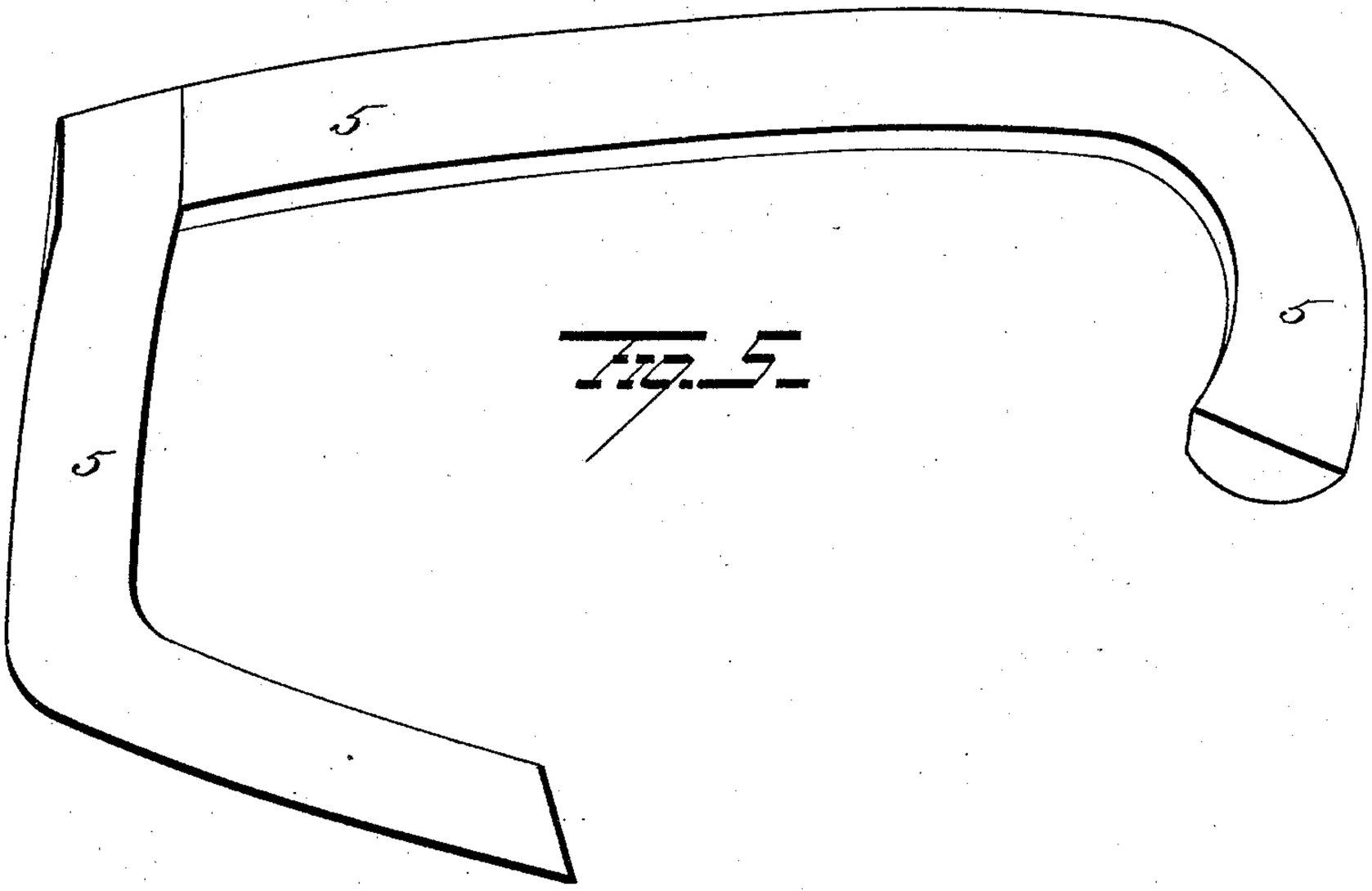


Fig. 5.

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UNITED STATES PATENT OFFICE.

JAMES OLIVER AND CHARLES ANDERSON, OF SOUTH BEND, INDIANA, ASSIGNORS TO THE SOUTH BEND IRON WORKS, OF SAME PLACE.

MOLDING-FLASK.

SPECIFICATION forming part of Letters Patent No. 433,361, dated July 29, 1890.

Application filed April 3, 1890. Serial No. 346,421. (No model.)

To all whom it may concern:

Be it known that we, JAMES OLIVER and CHARLES ANDERSON, of South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Molding-Flasks; and we 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 appertains to make and use the same.

Our invention relates to an improvement in molds for casting chilled articles, such as the various parts of a plow, and more particularly the mold-boards of plows.

A further object is to provide improved means for utilizing steam in the chill-pan and to otherwise reduce the expense, time, and labor required in casting by a convenient disposition and arrangement of parts.

With these objects in view our invention consists in a stationary chill having a raised chill-surface made in the shape of the article to be chilled and surrounded with a depression or groove adapted to receive a quantity of molding-sand, or sectional metal fillers in lieu thereof, against which the edges of the casting are formed, in combination with a drag filled with molding-sand; and it further consists in certain novel features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective of the chill-section. Fig. 2 is a similar view of the other section. Fig. 3 is a view of the reverse side of the chill-section. Fig. 4 is a sectional view through the flask, and Fig. 5 shows the metal filling-strips.

A represents the chill or stationary section of the flask, the same being hollowed out or concaved on its under surface to form, in connection with the bottom of the flask or drag, a steam-chamber, and a hole 1 is formed conveniently in one end of this section for the reception of a jet of steam. On the opposite or upper surface the chill or chill-surface 2 is located. This surface is raised sufficiently by the convex contour of the surface above the outer edges of the section, so that its entire surface may be easily reached and operated upon by an emery-wheel or other instrument for finishing the surface off, and around the edges of the chill or chill-surface and between its edge and the edges of the section an encircling groove or depression 3 is provided. The purpose of this formation is to receive a layer of molding-sand, against which the edges of the casting are formed. As it requires considerable skill to remove a casting without disturbing this layer of sand, it has been found feasible to employ metal filing-strips 5 5—such as those shown in Fig. 5—in lieu of the sand. These are made in just the size and shape which the sand is made to assume, the only difference being that they do not fill the entire depression, as the space 6 (indicated by dotted lines) is left, in which sand is rammed, and the gate is placed to form a passage for the molten metal, which is poured in through the sprue-hole in the other section to form the casting.

The numeral 7 represents the cope or movable section of the flask. This section consists preferably of a ring or band formed to conform to the shape of the chill-section, so that the two when together fit each other nicely. This section is rammed with sand and is provided with the sprue-hole, into which the molten metal is poured. As this section is not unlike others previously shown or described, a further description is deemed unnecessary.

The sections are preferably hinged at one end, so that the upper section or cope may be easily opened or closed, and at the opposite end the stationary section or drag is provided with a hole and the cope with a pin to enter the hole. This keeps the sections together, and with the hinge prevents their sliding

apart, but, on the other hand, does not prevent their being swung apart. For convenience in raising and throwing the cope back a handle or thumb-piece 8 is formed on the upper section.

In operating the flask when sand is used in the chill-section the pattern is placed on the chill-surface and the sand is rammed up in the depression. Then the cope is placed on and rammed with sand. The flask is then opened and the pattern and gate are removed, and when it is desirable to make a casting the flask is closed and molten metal is poured in through the sprue-hole 9, formed in the cope. The flask is now opened and the casting is removed, and the operation of molding and casting is then repeated.

The metal pieces 5 5 may be made detachable and removable, or they may be permanently riveted or otherwise secured to the chill. The advantage of using the metal filling-pieces instead of sand is that they insure a perfectly true and uniform edge to the moldboard and further lessen the expense of molding. We may cast the metal filling-pieces solid with the chill; but in view of the fact that it is difficult to grind and finish the surface of the chill clear to its outer edge, owing to the difficulty of operating an emery-wheel in the angle between the metal filling-pieces and the extreme outer edge of the chill, we prefer to make the metal filling-pieces separate from the chill and secure them thereto, whereby we are enabled to impart an even and uniform surface to the entire surface of the chill. We thus provide the operator with two fillings, either sand or metal, either of which he may use as he may find best suited for any particular kind of work.

The chamber underneath the drag is filled with steam by a nozzle attached to a flexible hose being inserted in the hole in the drag. A row of the flasks being ready for casting, steam is very quickly conveyed to the chamber of each drag by simply inserting the nozzle in the hole of the drag and allowing steam to flow therein, when the nozzle is removed and inserted in the next drag, and so on until any number of drags have been charged with steam. In this way a large number of drags may be quickly and easily heated to the required temperature for casting.

We have referred to the fact that we preferably employ a raised chilled surface, in order to facilitate the grinding and burnishing of the chilled surface. By reference to the drawings it will be observed that the chill-surface is raised above the outer rim or edge of the drag. This is done in order that the chill-surface may be subjected to the sweep of the carriage or emery-wheel, whereby we can very quickly impart an uniform and even surface to the entire surface of the chill, and this operation would be exceedingly difficult, if not impossible, should the chill-surface be located in a plane with or below the plane of the outer rim of the drag.

The chill-surface at its edge where the gates are located is preferably formed with a removable section or sections 10, which may consist of a narrow strip of metal, as shown, and be fastened in place by rivets or in any other desired manner. The object of the removable chill-section is as follows: In using the chill the molten metal issues from several holes formed at the edge of the chill, and as the highly-heated streams of metal come in contact with this edge they will operate to form little grooves in the edge of the chill, and thus after a time render the casting rough and grooved on this edge. To prevent this and provide ready means for repairing the chills at a small expense, we provide these renewable sections, so that when the edge of the chill has been grooved by the several streams of molten metal flowing over it we simply remove this worn section and replace it by a new one, and thus provide a practically new chill. In finishing the chill-surface we secure the renewable section in place and then grind the entire surface, and thus impart an even and uniform surface to both the main portion and the renewable section. In this way we prevent the chill-surfaces of the articles from showing any line or ridge at the joint formed between the chill-surface and the renewable section.

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

1. In a molding-flask, the combination, with a drag-section having a depression or groove formed entirely or partly around the chill-surface and between the latter and the edge of the drag, of a filling adapted to extend the entire length or part of the length of the channel or depression and project a distance above the chill-surface approximately equal to the thickness of the article chilled, and the outer edge of the drag extending flush with the surface of the filling, substantially as set forth.

2. The combination, with a drag-section having a chill-surface thereon, around which is a channel or depression formed between the chill-surface and the edge of the drag, and a removable section formed on one edge of the chill-surface, of a filling adapted to extend the entire length or part of the length of the channel or depression and project a distance above the chill-surface approximately equal to the thickness of the article chilled, and the outer edge of the drag extending flush with the surface of the filling, substantially as set forth.

3. The combination, with a drag-section

having a raised metallic chill-surface, a water or steam receptacle back of this surface, a depression or channel formed around the chill-surface and between the latter and the outer edge of the drag, and a cope-section consisting of a rim of metal filled with molding-sand, of sectional metallic filling-strips adapted to fit in the channel or depression and extend flush with the outer edge of the drag and a distance above the chill-surface approximately equal to the thickness of the article to be molded, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JAMES OLIVER.

Witnesses:
GEO. F. DOWNING,
V. E. HODGES.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES ANDERSON

Witnesses:
F. C. NIPPOLD,
MICHAEL MALOTT MATTHEWS.