

(Model.)

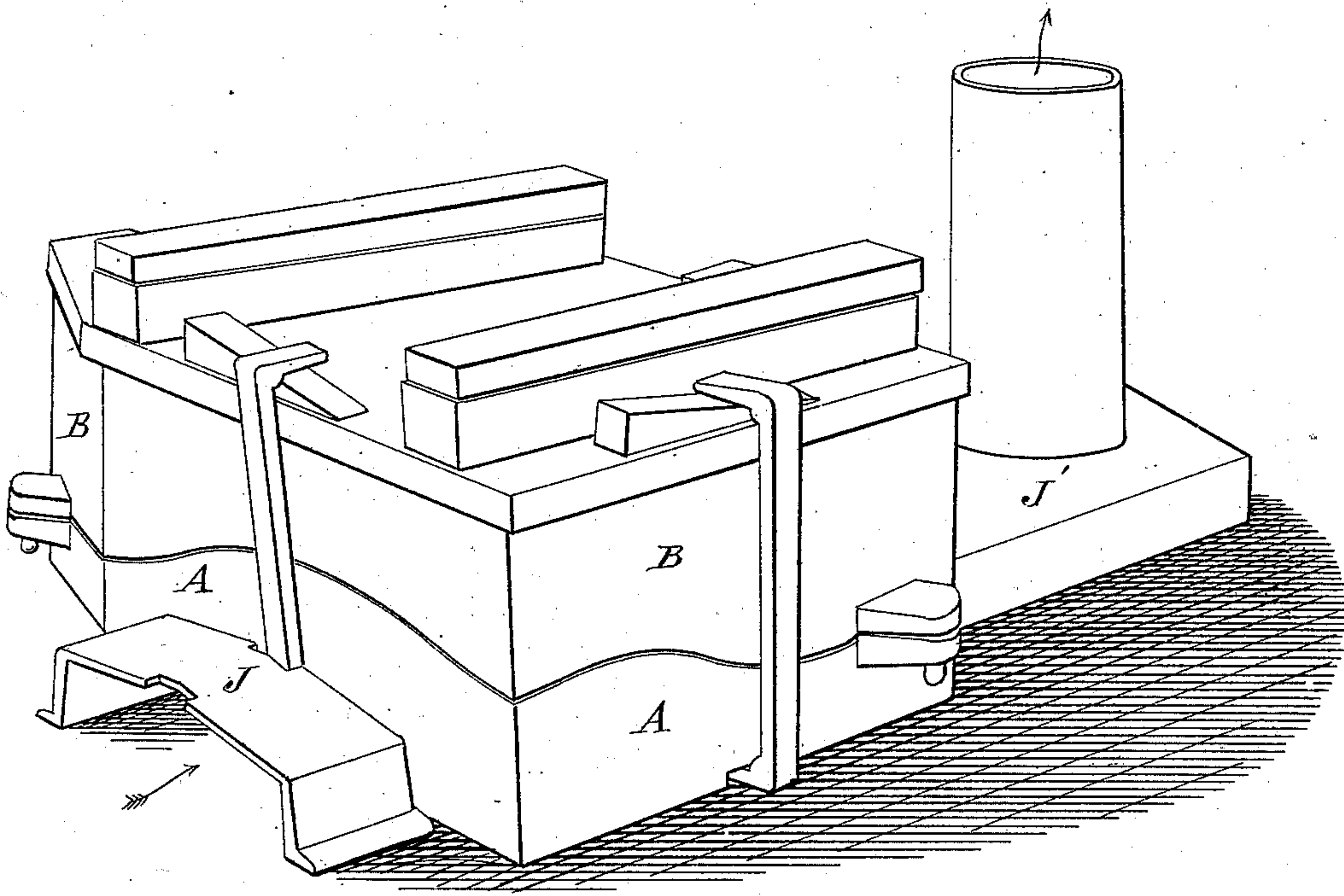
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B. B. HARRIS.  
Casting Chilled Mold-Boards.

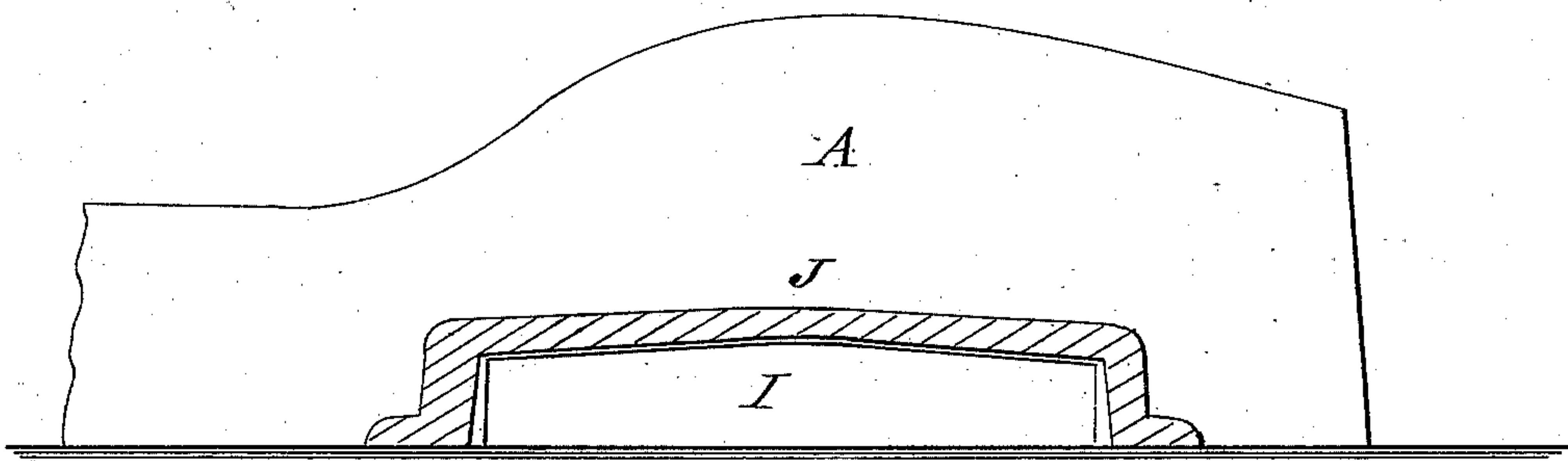
No. 228,064.

Patented May 25, 1880.

*Fig: 1.*



*Fig: 2.*



WITNESSES:

*Chas. Nida*  
*C. D. Dugan*

INVENTOR:

*B. B. Harris*

BY

*Mum & Co*

ATTORNEYS.

(Model.)

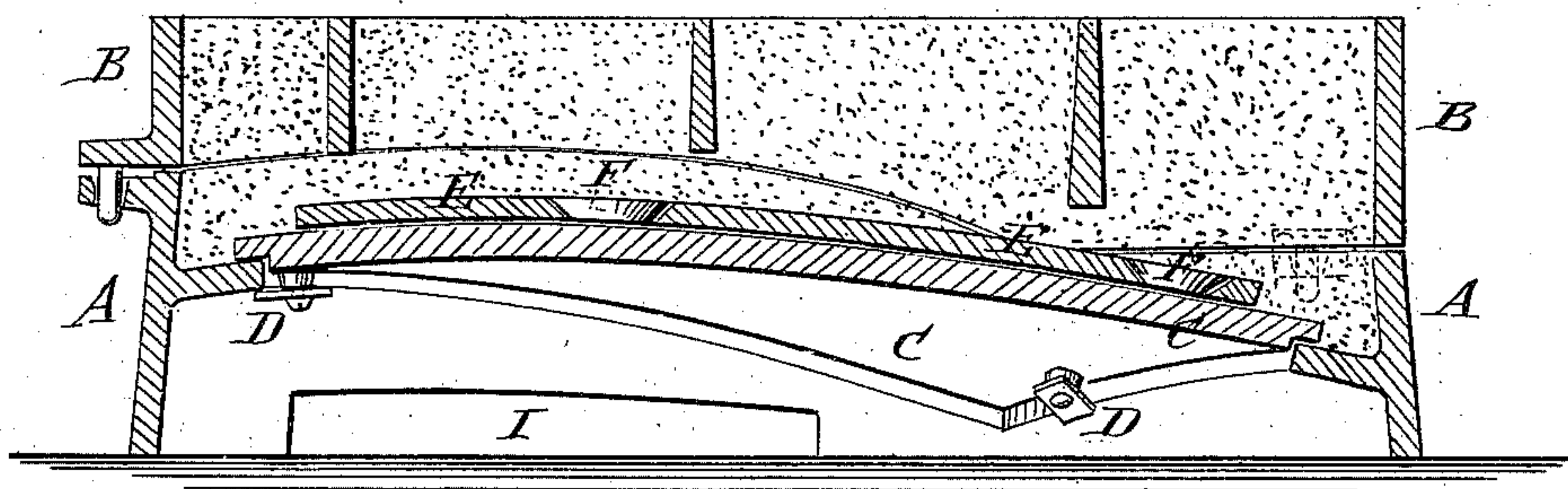
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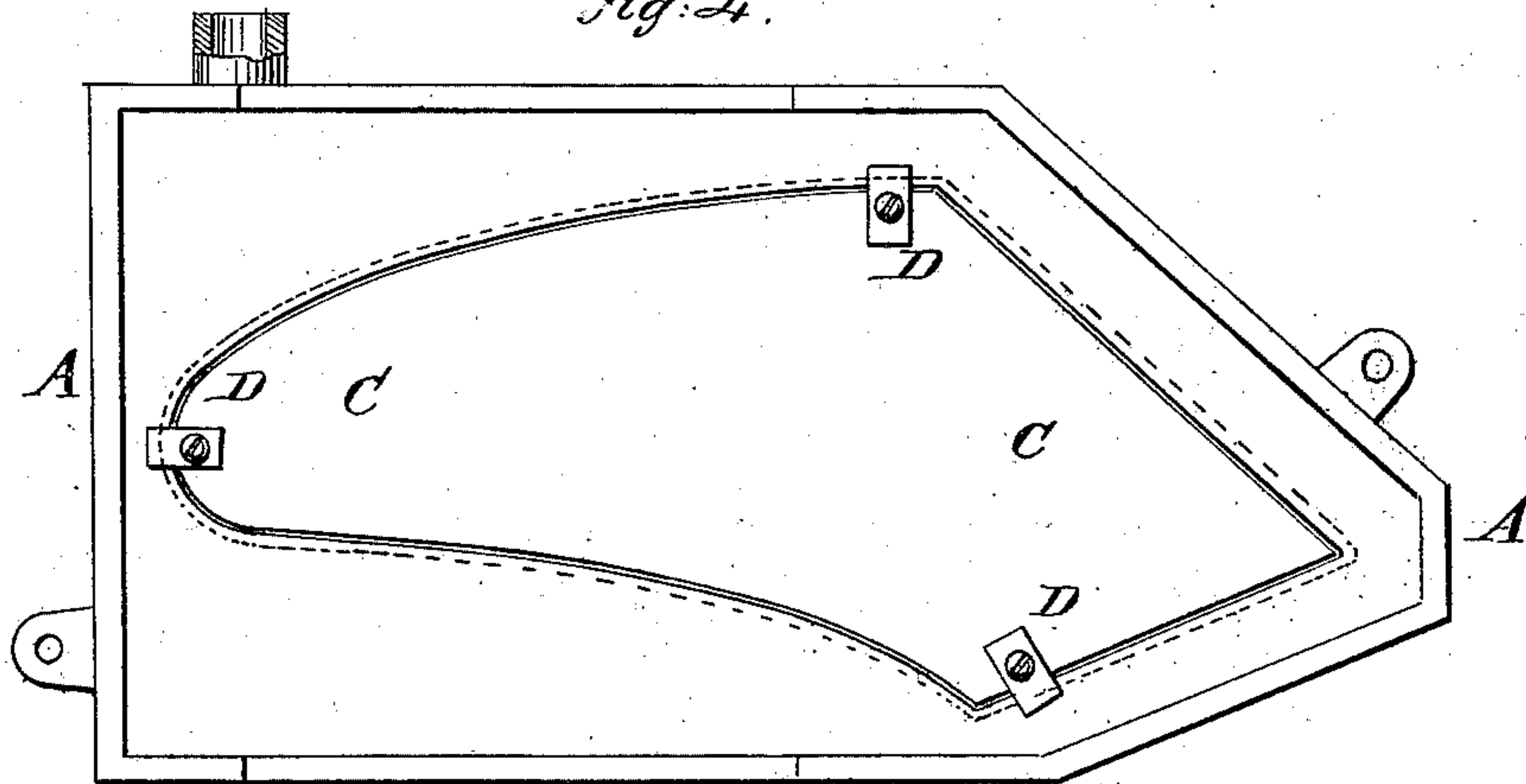
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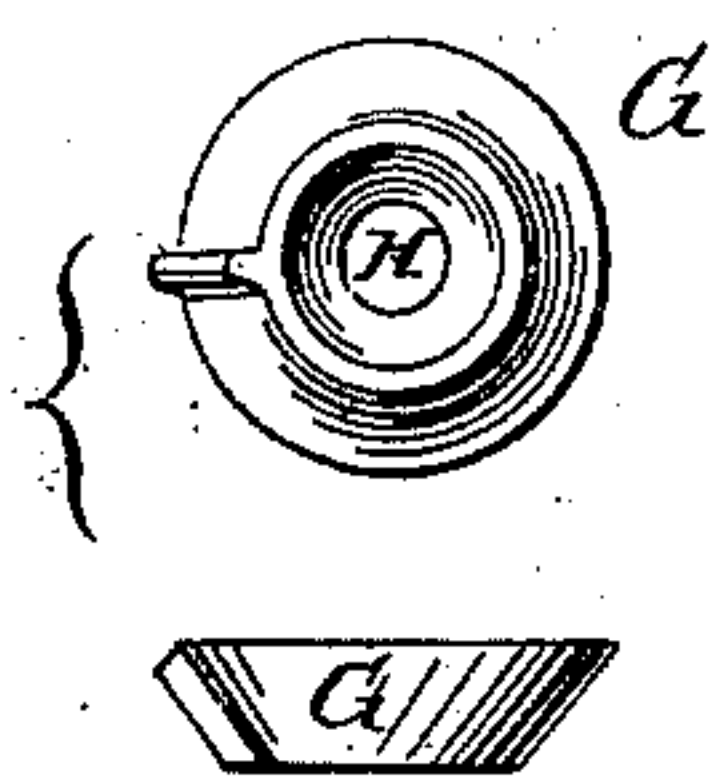
*Fig. 3.*



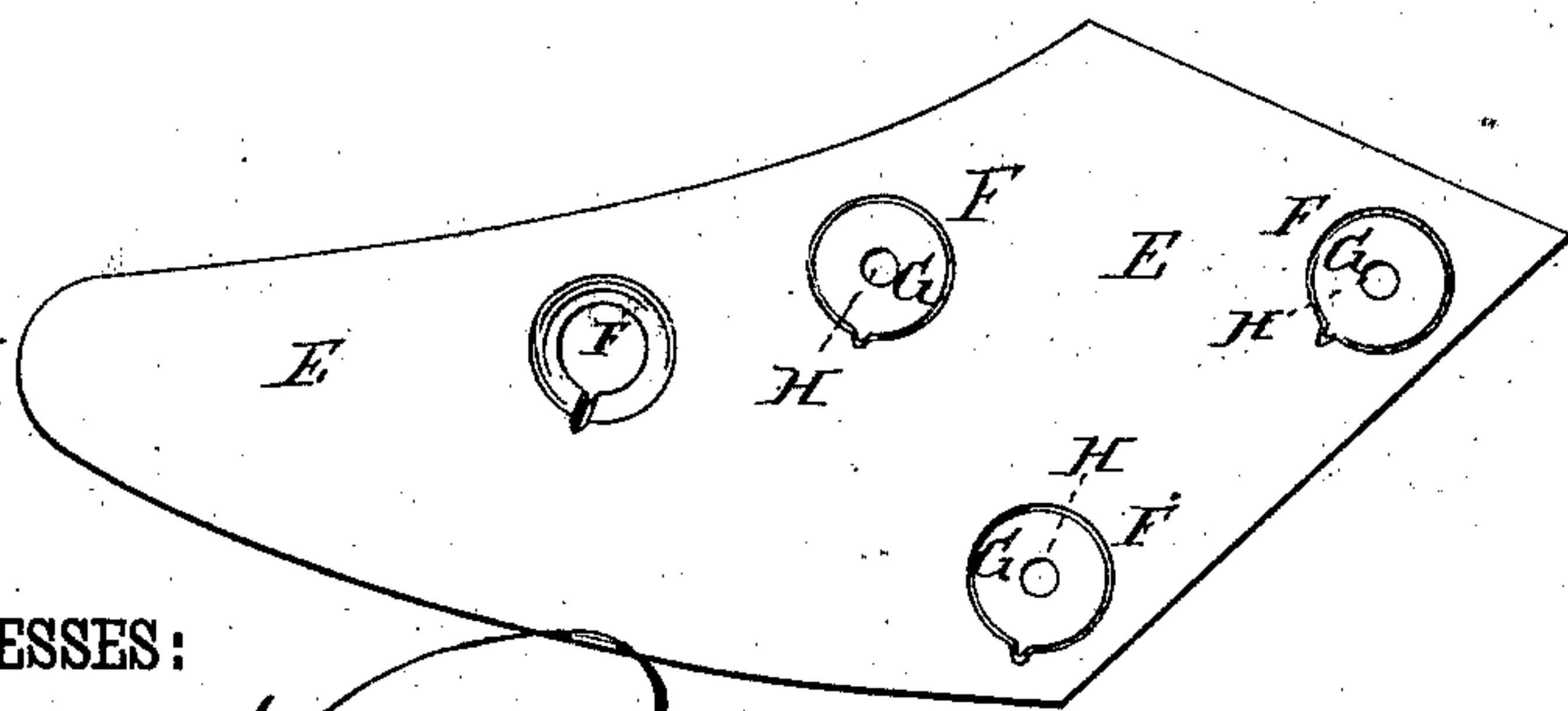
*Fig. 4.*



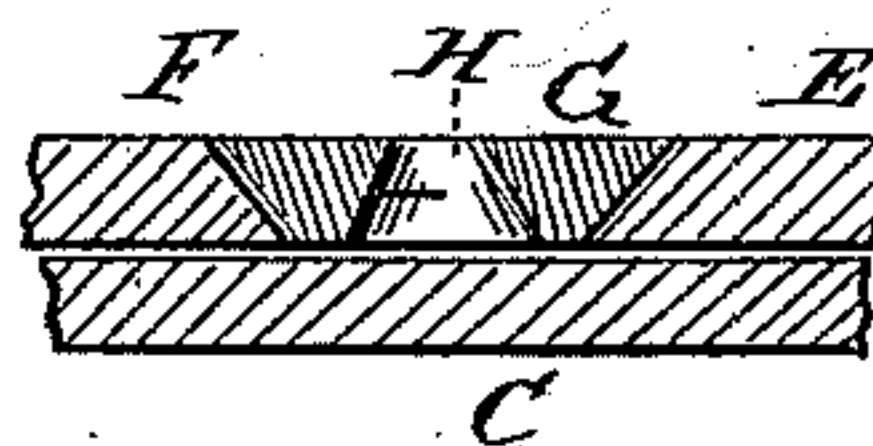
*Fig. 6.*



*Fig. 5.*



*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

BURNETT B. HARRIS, OF SOUTH BEND, INDIANA.

## CASTING CHILLED MOLD-BOARDS.

SPECIFICATION forming part of Letters Patent No. 228,064, dated May 25, 1880.

Application filed March 29, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, BURNETT B. HARRIS, of South Bend, in the county of St. Joseph and State of Indiana, have invented a new and useful Improvement in Casting Chilled Mold-Boards, of which the following is a specification.

Figure 1, Sheet 1, is a perspective view of a flask arranged for warming the chill. Fig. 2, Sheet 1, is a sectional elevation of the connecting-flue, the lower part of the flask being shown in side elevation. Fig. 3, Sheet 2, is a sectional elevation of the flask. Fig. 4, Sheet 2, is a bottom view of the lower part of the flask. Fig. 5, Sheet 2, is a plan view of the mold-board pattern. Fig. 6, Sheet 2, is a plan and a side view of a core-cup. Fig. 7, Sheet 2, is a cross-section of a core-cup shown in place.

Similar letters of reference indicate corresponding parts.

The object of this invention is to enable the molder to conveniently warm the chills, to hold the chill in place in the lower part of the flask, while allowing it to expand and contract freely, and to enable the pattern to be removed from the chill without disturbing the cores for casting the holes in the mold-board.

The invention consists in the combination, with the lower part of the flask having an opening in its bottom, of the chill having rabbeted edges and the buttons, so that the chill will be held securely in place and allowed to expand and contract freely; also, in the combination, with the chill and the mold-board pattern, of the core-cups having tapering holes, so that the patterns can be removed without disturbing the bolt-hole cores or dies; and also in the combination, with the lower parts of the flasks having openings in their sides, of the connecting-flues, so that the chills of a series of flasks can all be warmed at the same time and by the same furnace, as will be hereinafter fully described.

A represents the lower part or drag, and B is the upper part or cope, of the flask. In the lower part, A, of the flask is formed an opening to receive the chill C, the edges of which are rabbeted, as shown in Fig. 3, to fit loosely in the said opening. The chill C is secured to the bottom of the part A by buttons D, secured

to the lower side of the chills C by screws, so that the said buttons will not interfere with the contraction and expansion of the chill C, while keeping the said chill securely in place.

E is the mold-board pattern, in which are formed countersunk or tapering holes F in the places where the bolt-holes are to be cast in the mold-board. The holes F are made considerably larger than the required size of the bolt-holes, and into the said holes F are fitted the cups G, which are kept in place by points or flanges upon their sides to enter notches in the sides of the holes F.

In the cups G are formed tapering holes H, of the same size as the required bolt-holes, and which are designed to be filled with green sand to form the cores for casting the bolt-holes.

With this construction, when the pattern E is to be removed the core-cups G are first taken out, leaving the sand cores resting upon the chill, so that the pattern D, however crooked it may be, can be removed without disturbing the sand cores.

The cups C may also be used for placing iron dies or cores upon the chill, in which case the dies may be stuck fast to the chill, with a little red lead mixed with oil to prevent the said dies from slipping out of place.

In the sides of the lower parts, A, of the flasks are formed openings I, as shown in Figs. 2 and 3, to serve as heat-passages in warming the chills C.

When the chills are to be warmed twenty flasks, (more or less,) or as many as a man can mold in a day, are placed at a little distance apart, and the openings I in the adjacent sides of the flasks are connected by a connecting-flue, J, which is made with open bottom and sides, and with notches in its side edges to receive the clamps of the flasks.

The joints around the connecting-flues J and the lower parts of the flasks may be closed with sand or other packing. When thus arranged a small furnace is connected with the opening I of the first flask and a small upright flue is connected with the opening of the last flask, so that the heated products of combustion from the furnace may be drawn through all the flasks and all the chills warmed at the same time, and with a small amount of fuel.



When the chills have been sufficiently warmed the flasks are turned upon their edges and poured in the usual manner.

The operation of casting a chilled mold-board is as follows: In connection with the flue that connects with the furnace, place a chill and drag. Then place the mold-board pattern on the chill and, if iron dies are to be used for making the holes for the bolt-heads, put the dies in the cups, and then both together in the mold-board pattern. This will bring the large end of the die to rest upon the chill. The molding-sand is now placed around the mold-board pattern and rammed about the edge. The sides of the drag are only as deep as the chill and mold-board pattern, taken together, are thick. When the parting is made there is a border of sand around the mold-board pattern, where it remains. Now the parting-sand is sprinkled on, and then the cope placed in position and rammed. The sprue is a round stick three-fourths of an inch in diameter, about twenty inches long, and passes down through the ring or cup at the square end of the flask, connecting with the sand in the drag by means of a piece, like a common loop, which is doweled to the end of the sprue, which is withdrawn and the large end of the loop exposed, so that it may be readily drawn. The cup is now taken from the mold-board pattern, so as to leave the dies or cores which are to form the holes for the bolt-heads resting on the chill with a clear space or ring of three-eighths of an inch around them. It is now proper to draw the mold-board pattern, cut the gate in the sand which is in the drag, close the mold, put the bottom-board on top of the cope, and clamp fast to the drag. The chill is now ready for heating. A tight joint must be made around and between the flasks with sand, connection made with the upright flue,

and the fire lighted in the furnace. In thirty or forty minutes the chills will be warm enough for casting the mold-boards. The metal is at first poured in at the end farthest from the furnace. After the metal is set roll the flask down away from the furnace so as to bring the chill on top. Now lift the chill and the mold-board remains embedded in the cope, where it is covered with dry sand and left until cold enough to remove. I have the chill below during the heating, so that the moisture arising therefrom may be absorbed by the superposed sand in the cope.

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

1. The combination, with the lower part, A, of the flask having opening in its bottom, of the chill C, having rabbeted edges, and the buttons D, substantially as herein shown and described, whereby the chill will be held securely in place and allowed to expand and contract freely, as set forth.

2. The combination, with the chill C and the mold-board pattern E, having tapering holes F, of the core-cups G, having tapering holes, substantially as herein shown and described, whereby the mold-board pattern can be removed without disturbing the bolt-hole cores or dies, as set forth.

3. The combination, with the lower part, A, of the flasks, having openings I in their sides, of the connecting-flues J, substantially as herein shown and described, whereby the chills of a series of flasks may all be warmed at the same time and by the same furnace, as set forth.

BURNETT BARNY HARRIS.

Witnesses:

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MARY EVANS.