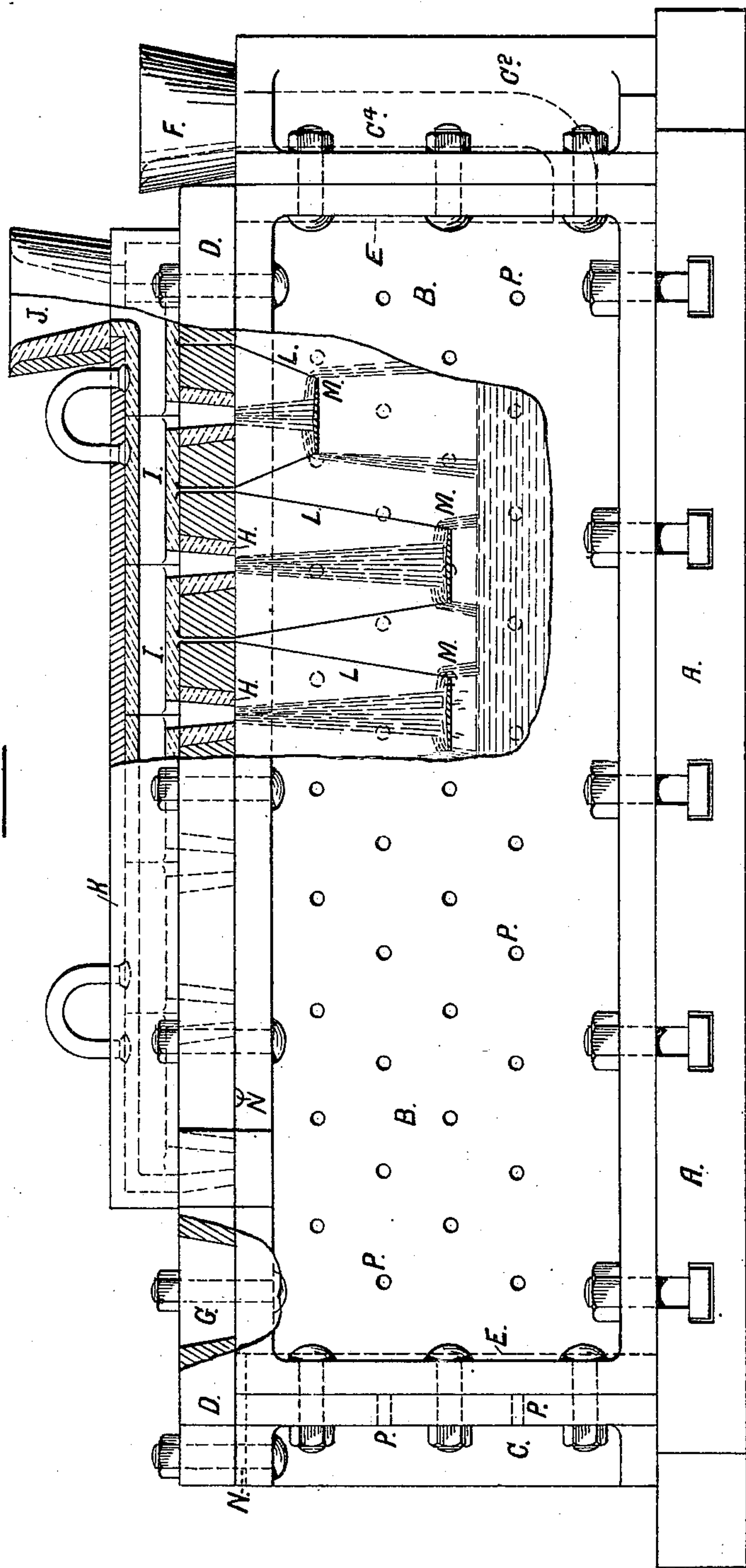


T. HAMPTON.  
MOLD FOR CASTING COMPOUND INGOTS.

No. 547,011.

Patented Oct. 1, 1895.

—FIG 1.—



WITNESSES:  
Geo. M. Whitney.

Saml W. Lord,

INVENTOR  
Thomas Hampton  
by Francis Forbes  
ATTORNEY.

(No Model.)

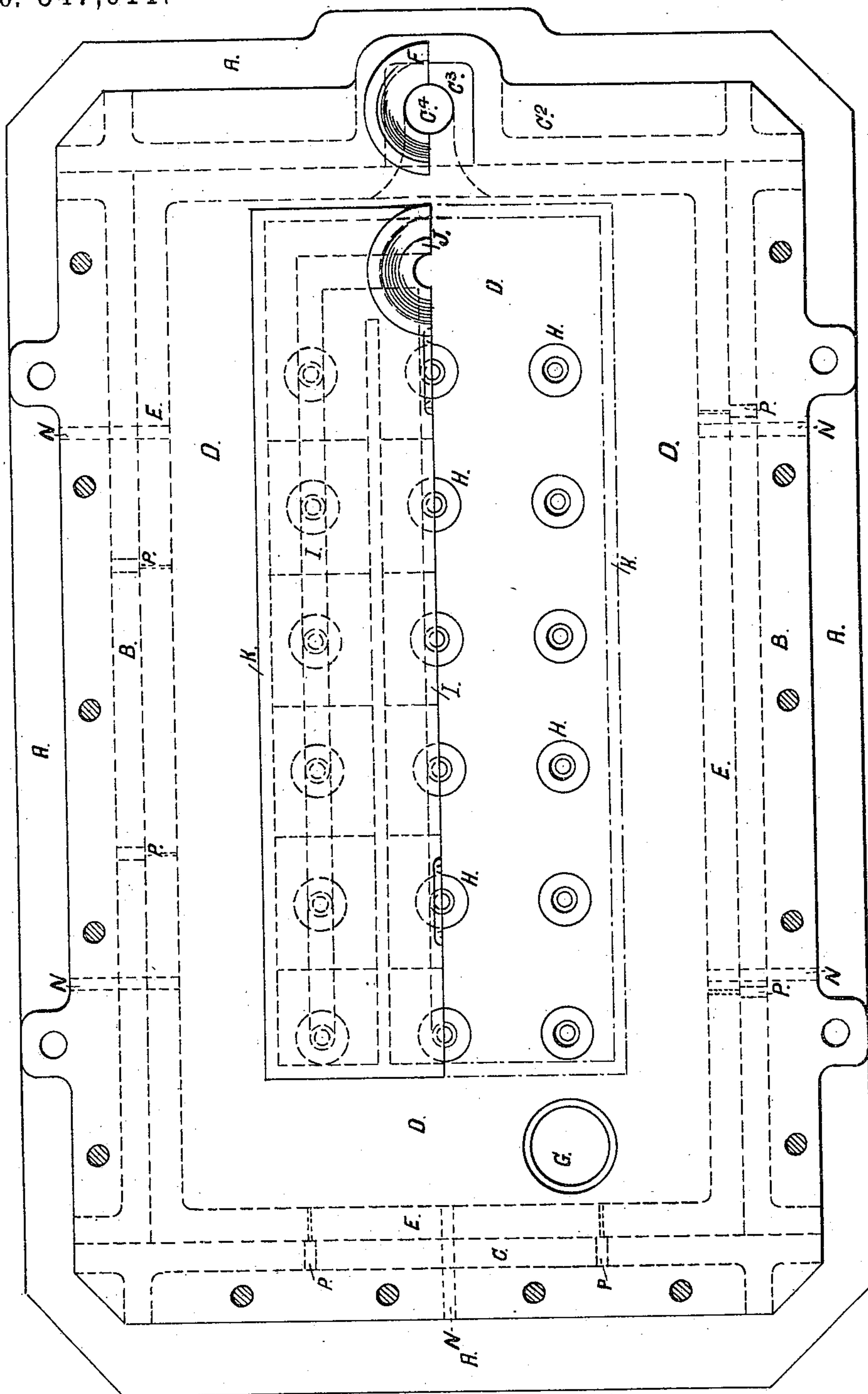
2 Sheets—Sheet 2.

T. HAMPTON.  
MOLD FOR CASTING COMPOUND INGOTS.

No. 547,011.

Patented Oct. 1, 1895.

—FIG 2.—



WITNESSES:

Geo. M. Whitney.

S. J. S. S.

INVENTOR.

Thomas Hampton

by Francis Forbes

ATTORNEY.



# UNITED STATES PATENT OFFICE.

THOMAS HAMPTON, OF SHEFFIELD, ENGLAND.

## MOLD FOR CASTING COMPOUND INGOTS.

SPECIFICATION forming part of Letters Patent No. 547,011, dated October 1, 1895.

Application filed April 22, 1895. Serial No. 546,776. (No model.) Patented in Sweden March 6, 1895, No. 273.

*To all whom it may concern:*

Be it known that I, THOMAS HAMPTON, a subject of the Queen of Great Britain, and a resident of Sheffield, in the county of York, England, have invented certain new and useful Improvements in Molds for Casting Compound Ingots, (patented to me in Sweden March 6, 1895, by Letters Patent No. 273;) and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in molds to be used in casting ingots for compound plates for armor and other purposes.

The mold is specially constructed for casting ingots of several layers of different qualities of steel—such, for example, as a first layer of hard steel, a second layer of soft steel, and a third layer of moderately-hard steel—all to be in perfect combination without detrimental intermixture or destruction of their distinctive qualities.

The ingot-mold is illustrated in the annexed drawings, in which—

Figure 1 is an elevation of one side of the mold with certain parts shown in section; Fig. 2, a plan or top view of same.

The ingot-mold is arranged horizontally, so that the several layers of steel which compose the ingot may flow to a uniform thickness throughout, and its special construction is to enable the second and any additional layers of molten metal to be poured into the mold while the preceding layer is in a semi-fluid condition and in such a manner as to cause as little agitation of the preceding layer as possible.

The mold, as illustrated, consists of a base-plate A, with two sides B, two ends C and C<sup>2</sup>, and a cover-plate D, and these parts are bolted together, allowing any damaged portion to be replaced. I prefer to line the sides and ends of the mold with refractory or heat-resisting composition, the thickness being indicated by dotted lines at E. (See Fig. 2.)

In the end plate C<sup>2</sup> is a recess C<sup>3</sup>, set back from the mold-chamber and filled with the refractory composition, through which is an inlet-passage C<sup>4</sup>, which passes downward and opens into the mold-chamber at or near the bottom. This is for the admission of the first

layer of steel and prevents the molten steel from splashing about, while it is readily formed and is as durable as the remainder of the mold.

F is a removable funnel to inlet C<sup>4</sup>. The heavy cover-plate D is constructed with a number of openings through it into the mold-chamber. That marked G is used for gaging the depth and testing the fluidity of the steel during the process of casting. The smaller openings are fitted with nozzles H, of refractory composition, through which the molten steel for the second and following layers flows into the mold-chamber in numerous small streams distributed over the horizontal area of the layer last cast, so as to avoid as much as possible any agitation of the latter by the entering metal. These nozzles H are in communication with conduits I, of the refractory composition, through which the molten steel flows from the funnel J to the nozzles H. The composition-conduits I are held in a separate frame K, which can be readily removed and replaced by another. Under the nozzles H individually I support by means of wires L a series of light metal plates M, upon which the streams of molten steel from the nozzles fall and are spread on all sides in divided streams and drops, or what I call "spray." The second layer may be cast through one series of nozzles and the third layer through another series of nozzles, in which case I remove the first-used frame K, with its contained conduits, and substitute another frame, the conduits of which will communicate with another series of nozzles in the cover-plate. The plates M for the second layer will hang from longer wires and those for the third layer will hang from shorter wires. The spreaders and their wires L become melted and incorporated with the ingot.

In casting an ingot of three layers of different qualities of steel to produce a hard face, a soft-steel center, and a semi-hard back I proceed as follows: The three qualities of steel are melted in separate furnaces, and that for the hard face is first poured into the mold-chamber through the funnel F and passage C<sup>4</sup>. When this molten steel begins to set, (which is ascertained through the hole G,) the steel for the second layer is brought



to the mold and poured into the funnel J, passing through the connected conduits and a series of nozzles and falling upon the lower spreaders M and then upon the first layer of steel. When the operator, by investigating through the hole G, considers the proper time has arrived, the steel for the third layer is brought to the mold and poured through the funnel J and a substituted set of conduits connected with the remaining series of nozzles and their spreaders, as before described. Provision may be made for the escape of gas generated in the mold-chamber in any convenient manner. In the drawings it finds vent through a number of grooves N, extending from the mold-chamber outwardly between the cover-plate D and the top edge of the mold, as well as through holes P, made in the sides of the mold and pricked through the composition.

I do not claim herein the within-described process of spray-casting, which consists in casting a first layer in horizontal position, and while the same remains in said position and is still molten pouring in the metal for a second layer in numerous small streams or spray distributed over the horizontal area of the first layer, as this process is set forth and claimed in my previous specification, forming part of an application for Letters Patent of the United States filed July 21, 1894, Serial No. 518,266. Neither do I claim herein, broadly, a horizontal mold for casting compound ingots having a cover provided with one or more funnels connected by means of conduit-pipes and conduit-blocks with a number of spray-nozzles opening into a mold-chamber common to all for the purpose of distributing the molten metal in small streams or spray over the horizontal area of a subjacent molten layer, nor the combination in such a mold-chamber of a funnel having a direct passage for the molten metal into the mold-chamber, and one or more funnels having indirect passages for the molten metal through horizontal conduits and vertical spray-nozzles, the latter distributed horizontally above the area of said mold-chamber, as these combinations of parts are set forth and claimed in said previous specification.

With reference to the previous state of the art I further disclaim the arrangements for introducing molten steel into molds for compound ingots, set forth in the Illingworth

Patents Nos. 349,886 and 349,998, dated September 28, 1886; the arrangements of conduits and nozzles of refractory composition set forth in the Hampton and Facer Patent No. 380,321, dated April 3, 1888; the strainer device set forth in the Haffey Patent No. 304,314, dated September 2, 1884, and the spraying or granulating device set forth in the Stewart Patent No. 92,667, dated July 13, 1869.

What I claim as my invention, and desire to patent under this specification, is—

1. A horizontal mold, for casting compound ingots, having sides and ends, one of which is constructed with a recessed vertical extension, lined with refractory composition, and provided within the lining of said vertical extension with an inlet-passage opening into the mold-chamber at or near its bottom, a cover-plate having recesses provided with vertical nozzles distributed over the horizontal area of said mold-chamber, a superposed removable frame containing horizontal conduits communicating with a number of said nozzles, a funnel which receives the metal for the first layer communicating with said inlet-passage, and a funnel which receives the metal for a second or third layer communicating with said horizontal conduits, substantially as hereinbefore specified.

2. In a horizontal mold for casting compound ingots, the combination with means for pouring the first layer of the ingot and with a funnel which receives the metal for a second or third layer, and with horizontal conduits communicating with said funnel, of a cover-plate immediately above the mold-chamber provided with a series of vertical nozzles distributed over its horizontal area and communicating with said conduits, light metallic spreaders suitable for immersion in and incorporation with the molten metal, and wires of like metal suspending said spreaders severally beneath the respective nozzles, substantially as and for the purpose specified and set forth.

In testimony that I claim the foregoing as my own I have affixed hereto my signature, in presence of two witnesses, this 8th day of April, 1895.

THOMAS HAMPTON.

Witnesses:

WILLIAM MCALISTER,  
ROBERT YOUNG.