

No. 638,909.

Patented Dec. 12, 1899.

S. A. COSGRAVE.
MOLD FOR COMPOUND INGOTS.

(Application filed Sept. 1, 1899.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

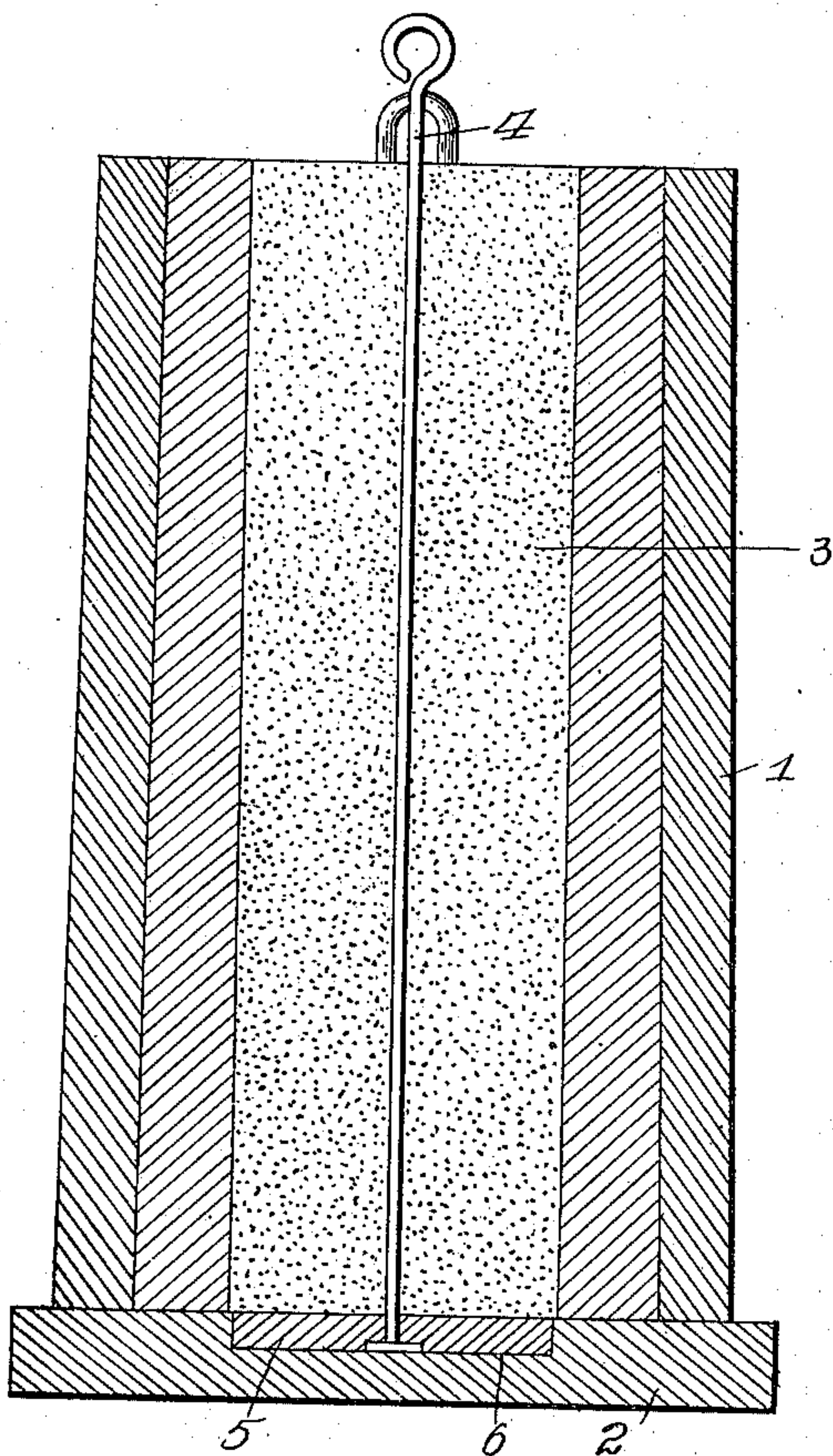


FIG. 3.

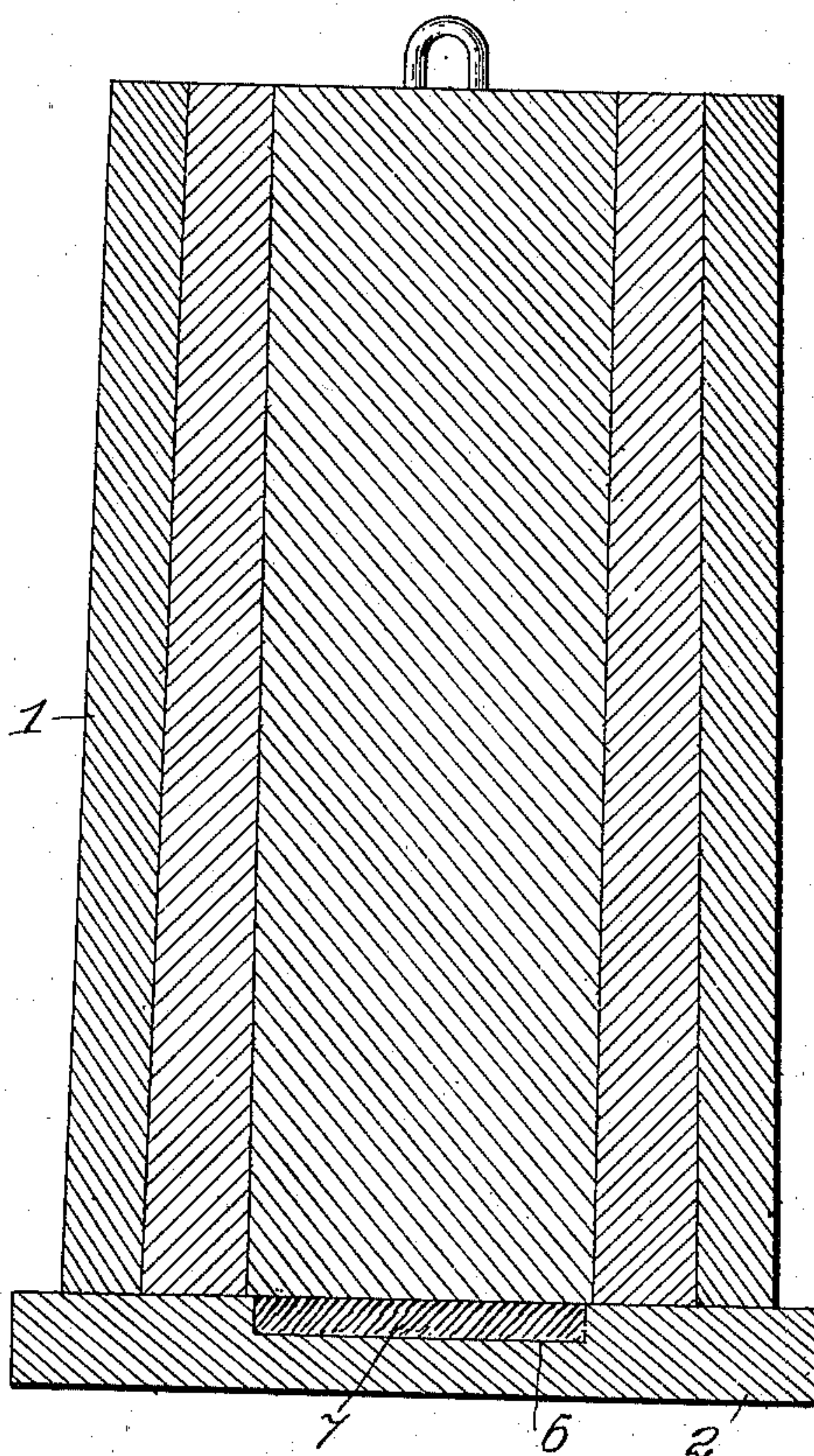


FIG. 2.

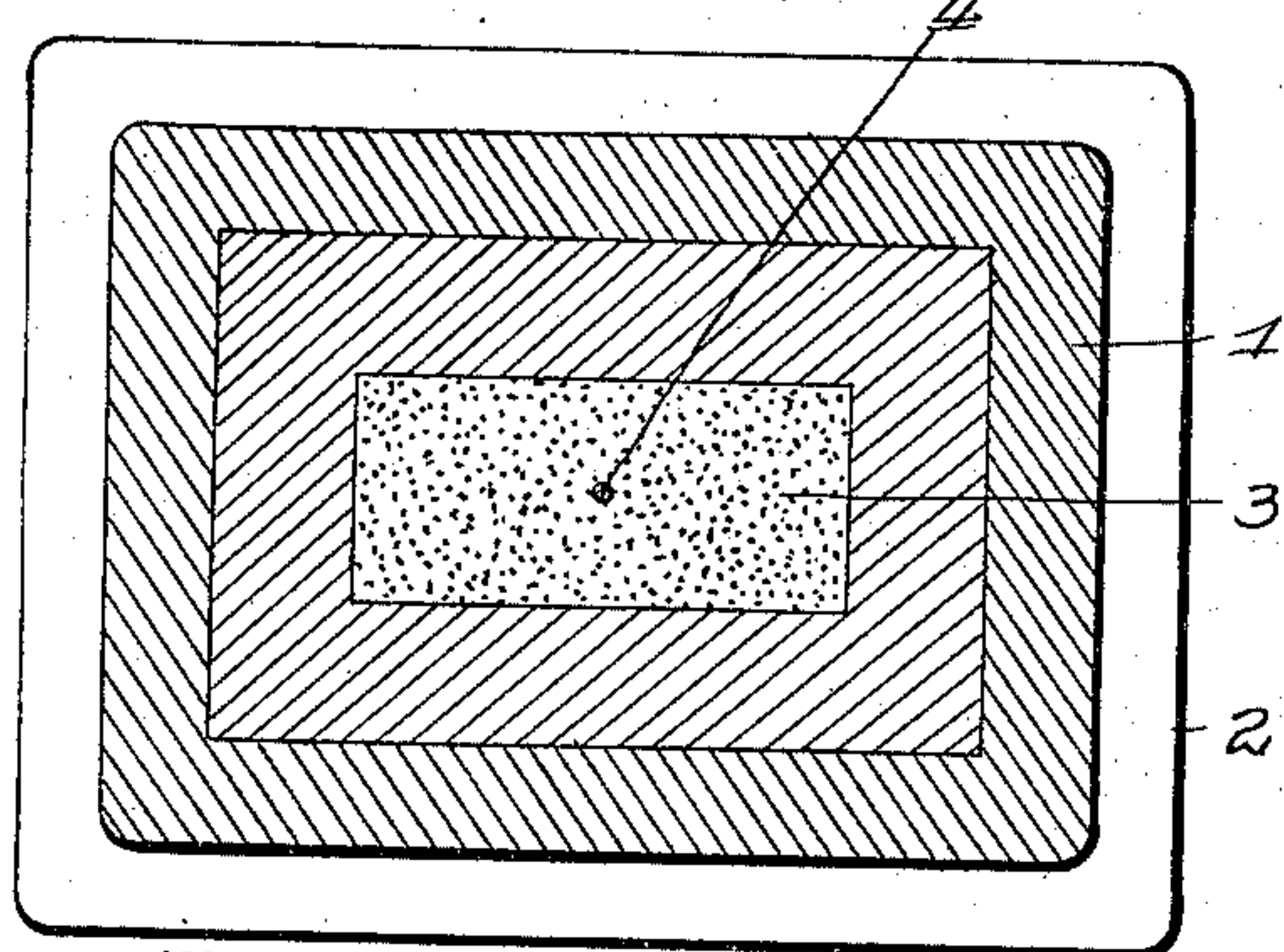
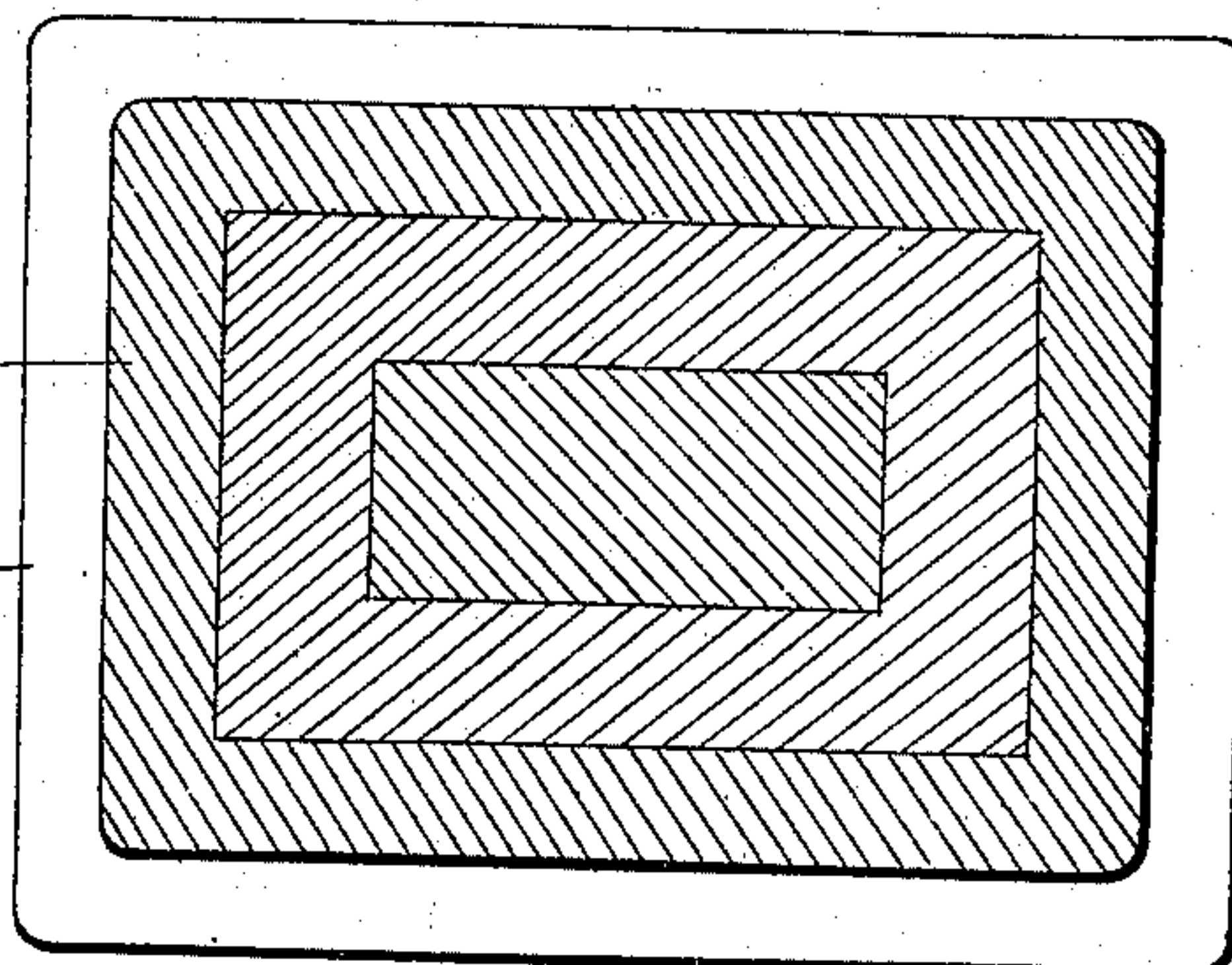


FIG. 4.



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FIG. 6.

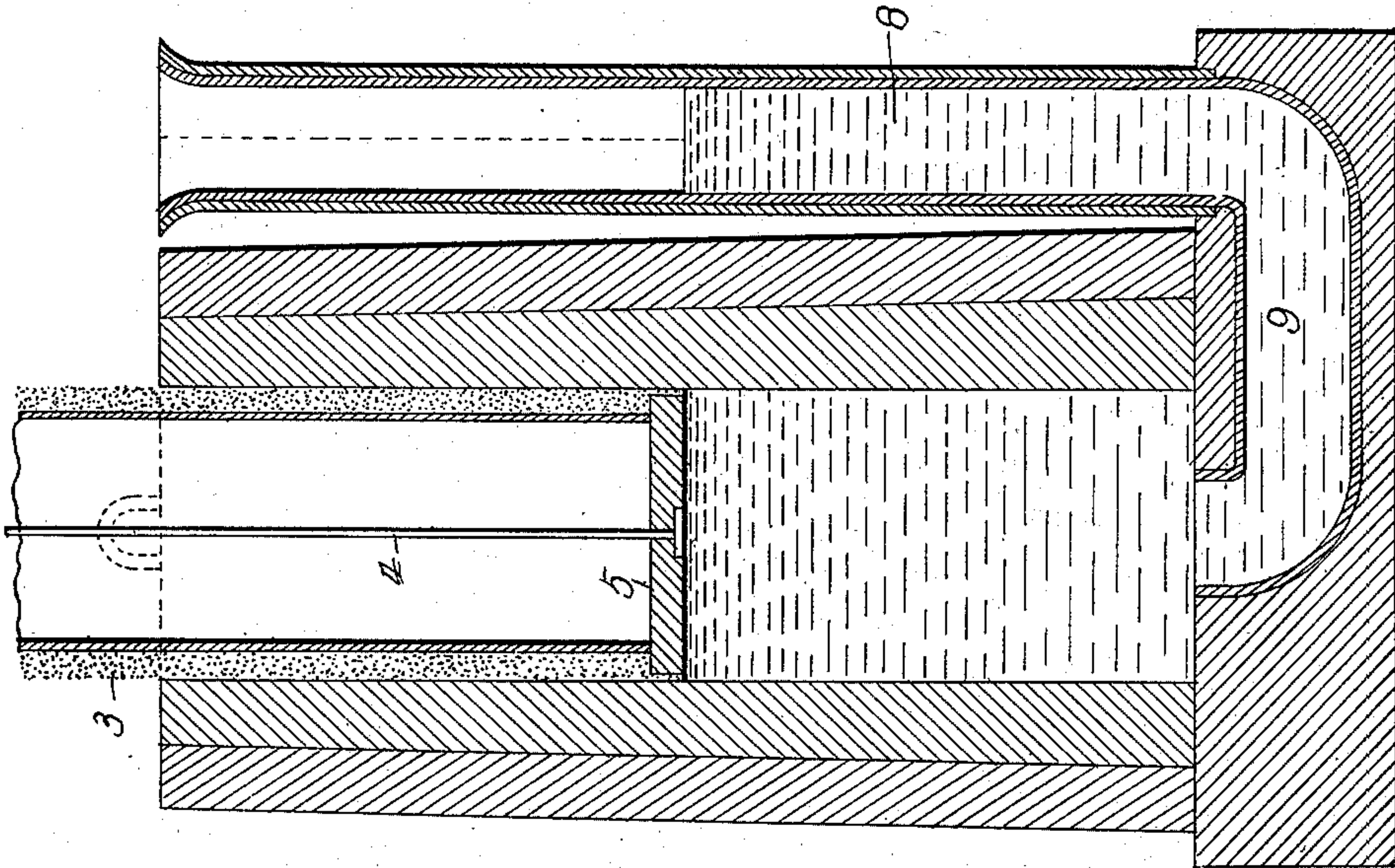
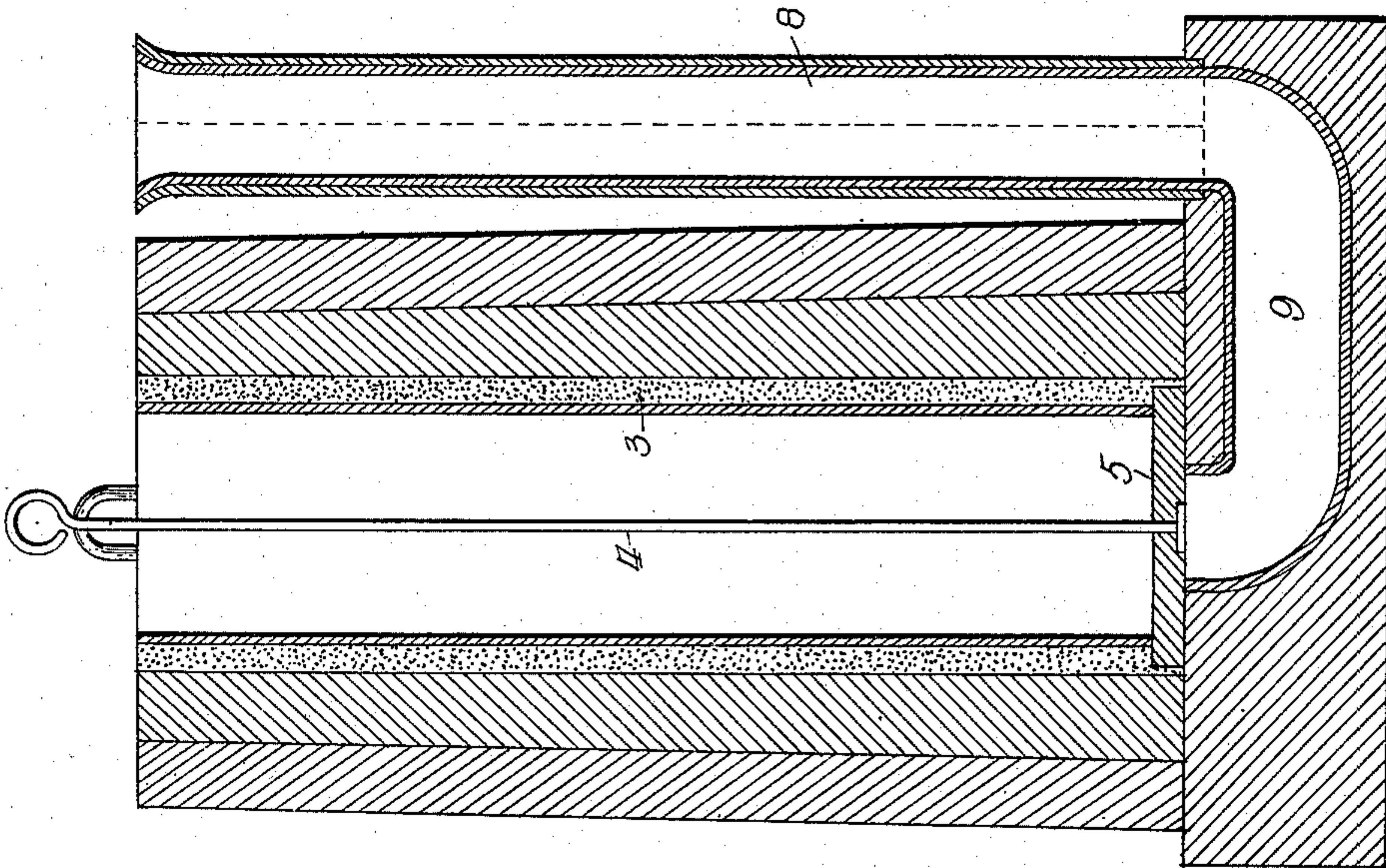


FIG. 5.



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UNITED STATES PATENT OFFICE.

SYLVESTER A. COSGRAVE, OF EDGEWOOD PARK, PENNSYLVANIA, ASSIGNOR
TO MARIA B. COSGRAVE, OF SAME PLACE, AND AARON FRENCH AND
MARGARET L. PATTERSON, OF PITTSBURG, PENNSYLVANIA.

MOLD FOR COMPOUND INGOTS.

SPECIFICATION forming part of Letters Patent No. 638,909, dated December 12, 1899.

Application filed September 1, 1899. Serial No. 729,164. (No model.)

To all whom it may concern:

Be it known that I, SYLVESTER A. COSGRAVE, a citizen of the United States, residing at Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Molds for Compound Ingots, of which improvements the following is a specification.

The invention described herein relates to certain improvements in apparatus for the practice of the inventions described and claimed in applications, Serial Nos. 714,952 and 729,163, filed, respectively, April 29 and September 1, 1899. The inventions set forth in said applications consist, generally stated, in casting one kind or grade of metal against a mold-wall formed in part at least of a material which will eliminate or prevent the formation of any oxid or other elemental change which might prevent an intimate union of such metal with another metal, removing such mold-wall, and then casting another kind or grade of metal against the prepared surface.

The object of the present invention is to provide for the manufacture of compound ingots having their central or interior portions formed of one kind or grade of metal which is surrounded or inclosed by another grade or kind of metal.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of an ingot-mold having a core in position and showing one kind or grade of metal cast around the core. Fig. 2 is a horizontal section of the same. Figs. 3 and 4 are views, respectively similar to Figs. 1 and 2, showing the core removed and the space occupied by the core filled with another kind or grade of metal. Fig. 5 is a sectional elevation of a mold constructed to permit of the casting of the metal through the bottom of the mold, and Fig. 6 is a similar view showing the core partially withdrawn and the space so formed filled with metal.

In the practice of my invention the ingot-mold 1 is of the usual or any desired shape, with its walls preferably slightly inclined

outwardly from the top down, so as to facilitate the removal of the mold from the ingot. This mold is supported, as is customary, on the stool 2, and the core is arranged within the mold. It will be understood that if a greater thickness of metal is desired on one side of the core than on the other the core can be placed eccentrically within the mold.

The method set forth in the applications referred to can be effected by allowing the metal first cast to solidify sufficiently to permit of the removal of the mold and the forcing out of the core in any manner, then reheating the hollow ingot, placing it on a stool or plate, and then casting the other metal into the heated ingot. It is preferred to effect the removal of the core just as quick as a sufficiently-thick skin has formed around the core to retain the still molten metal of the interior of the ingot and immediately casting the other metal into the matrix thus formed. By this method the high heat of the two bodies separated by the thin wall of solidified but still highly-heated metal will be melted, thereby permitting an interdiffusion of the characteristics of the two metals. To this end the core 3 is formed around a lifting-rod 4, which has a supporting and removing plate 5 secured to its lower end. The core should be so formed on the supporting and removing plate as to entirely protect the latter from contact with the molten metal first cast. This protection is preferably effected by making the supporting and removing plate slightly smaller than the core, as shown in Fig. 1, and providing a socket 6 in the stool for the reception of the supporting and removing plate. This socket is made sufficiently deep to permit the edges of the core projecting outside of the supporting and removing plate to rest upon the stool.

By the employment of a supporting and removing plate slightly smaller than the core, which is formed of or coated with a fluxing or deoxidizing material, as set forth in the specifications referred to, a considerable quantity of such material will be left on the surface of the metal as cast, as is desirable for reasons stated in said applications.

After the core 3 has been placed in position

in the mold one kind or grade of metal, as high-carbon steel, is cast around the core. As soon as a sufficiently-thick skin is formed around the core to retain the interior metal, 5 which is still molten, the core is removed by pulling up on the rod 4 and the other metal immediately cast into the space occupied by the core 3. While not necessary, it is preferred to place a tile 7 of fire-clay or other refractory material in the socket in the stool. 10

In order to prevent as far as possible any exposure to atmospheric influences of the wall uncovered by the removal of the core, a pour-gate 8 is connected to a passage 9 through the stool of the mold, the outlet of each passage 15 being located so as to be covered by the core during the casting of the first metal. If the second metal be poured into the gate 8 as the core is being withdrawn, there will not be any material exposure of the surface uncovered 20 by the removal of the core. If the second metal be so poured as to closely follow the core as it is withdrawn, the core may be withdrawn earlier, as the inflowing metal will support the shell formed on the surface of the 25 metal first cast.

As the metal in the wall of the annular ingot first formed is molten and as the thin skin formed against the core is at a high temperature when the second metal is cast, the retaining skin or shell, being very thin and in- 30 closed between two bodies of molten metal, will become molten, thus affording an opportunity to unite intimately, so that the characteristics of one metal will modify those of 35

the other for a considerable distance on each side of the plane of union. Hence there will not be a sharp line of demarcation between the two metals, but a gradual merging of the characteristics of one metal into those of the other. 40

I claim herein as my invention—

1. The combination of a mold, a core having its exterior portion formed by a friable material, a supporting and removing plate at 45 one end of the core, said supporting and removing plate having a smaller periphery than the core, and means for removing the supporting and removing plate through the annular body of metal formed around the core, sub- 50 stantially as set forth.

2. The combination of a mold, a supporting and removing plate, a pull-rod attached to the plate and a core formed around the rod and resting on the plate, the exterior portion of 55 the core being formed of a friable material, and extending beyond the edges of the supporting and removing plate, substantially as set forth.

3. The combination of an open-topped 60 mold provided with an inlet at its lower end, a core covering said inlet, and means for withdrawing said core, thereby uncovering said inlet, substantially as set forth.

In testimony whereof I have hereunto set 65 my hand.

SYLVESTER A. COSGRAVE.

Witnesses:

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M. S. MURPHY.