J. H. SHAW.

PERMANENT MOLD.

APPLICATION FILED OCT. 3, 1906.

926,965. **Patented July 6, 1909.**

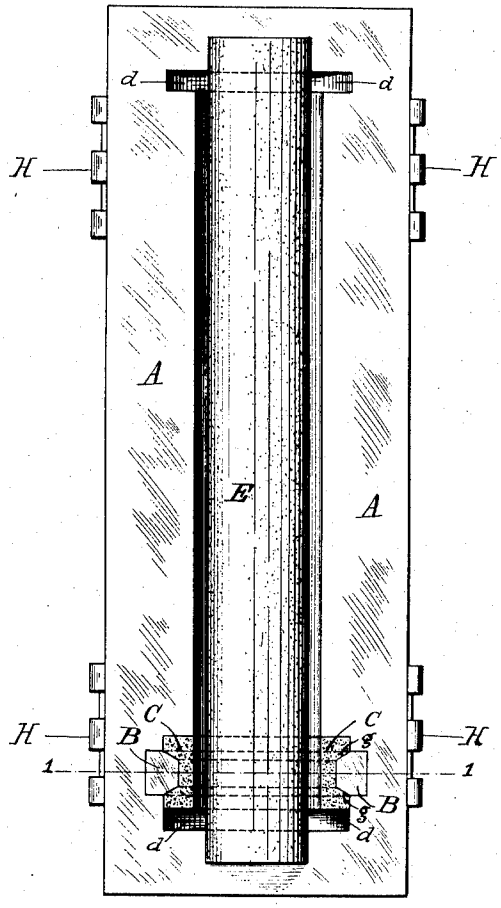


Fig. 1.

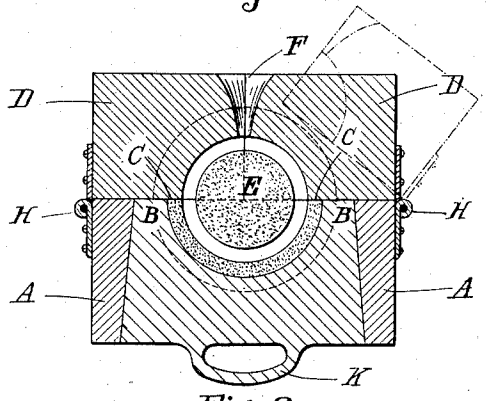


Fig. 2.

WITNESSES:

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PERMANENT MOLD.

No. 926,965. Specification of Letters Patent. Patented July 6, 1909.

Application filed October 3, 1906. Serial No. 337,270.

To all whom it may concern:

Be it known that I, JOHN H. SHAW, a citizen of the United States, residing in the town of New Haven, county of New Haven, and State of Connecticut, have invented new and useful Improvements in Permanent Molds, of which the following is a specification when taken in connection with the accompanying drawings.

My invention relates to improvements in permanent molds whereby the mold is relieved from strains to which it would otherwise be subjected, and the casting permitted to contract in cooling without distortion, breakage, or undue straining.

Permanent molds of the class to which my invention relates are rigid and unyielding, and for this reason the casting of large pieces having projecting surfaces is often attended with great difficulty. For instance, iron columns provided with flanges at either end cannot be cast in permanent molds without great danger of breaking the flanges in the lower half of the mold before the casting can be removed therefrom. Nevertheless it is desirable in the case of such columns, and of many other articles, to use permanent molds because they produce castings of greater tensile and crushing strength, for a given weight of metal, than can be produced in sand molds, as well as for other reasons well understood.

By my improvements the advantages of the permanent mold are retained, and, at the same time, provision is made for contraction of the casting in cooling.

My invention consists in inserting behind such projecting surfaces as are liable to be strained or broken in cooling, when cast in an ordinary permanent mold, a collapsible, or compressible, insert, rigid enough to cause the molten metal to set in the desired form, but yielding to the shrinkage of the casting in cooling.

It also consists in means for supporting said insert during the operation of pouring the casting, said means being withdrawn from said insert after the casting has set and before any considerable shrinkage has taken place. The collapsible, or compressible, insert which remains in the mold offers no injurious resistance to the contraction of the casting in cooling, and is at the same time so small in comparison with the other molding surfaces as not to affect substantially the quality of the casting.

In the drawings, Figure 1 shows a top plan of the lower half of a permanent mold for casting a column having flanges at either end and provided with my improvement. Fig. 2 is a cross section of said permanent mold on the line 1—1.

In both figures, like letters indicate similar parts.

A. A. is the body of the mold, having part of the molding surface of the lower half of the mold adjacent to the inner face of one of the flanges of the casting removed, and a recess formed in the body A of the mold, as shown. B. B. is a metal plug fitting into said recess, said plug and recess being so formed, as shown, that the plug may be removed from the recess while the casting is still in the mold. When the plug is in place its inner face falls short of reaching into the plane of the molding surfaces adjacent to the flange. The sides of the said plug near its inner face are tapered as shown at *g g* in Fig. 1. K is a handle for convenience in inserting and removing said plug.

C. C. is an insert of sand, clay or other suitable material such as will give way under considerable pressure when not supported by the plug B. B. D. D. are the two swings of the upper half of the mold, each hinged to the lower half of the mold as usual at H, and F is the gate. One of the molding surfaces of said insert C. C. adjoins the void for the flange of the column, on the side toward which said flange moves as the casting shrinks in cooling; the other molding surface of said insert shapes the neck of the column under the flange for a distance which need be no greater than is necessary to provide for the calculated shrinkage in the length of the casting.

In operation the plug B. B. is inserted into its recess in the permanent mold A. A. and the void left in the molding surfaces at this point is supplied by the insert C. C. The upper half of the permanent mold illustrated in the drawing, to wit, a mold for a cast iron column, may be made without any collapsible insert behind the flange of the casting, because it is practicable in the case of such a mold to open the upper half after the casting has set, and before any considerable shrinkage has taken place. The upper half of the mold having been closed, the metal for the casting is poured in the usual way. The plug B. B. supports the insert C. C. during this operation. When the casting has set, the upper half of the mold is opened and the plug

B. B. pulled out, leaving the insert C. C. in place. Lengthwise contraction of the casting, which in the case of cast iron columns may amount to several inches, crushes the insert C. C. without injury to the flange of the column and the casting may remain in the lower half of the mold as long as is convenient.

I do not limit myself to the shape of recess, plug or insert shown in the drawing, or to the use of such recess, plug or insert in the lower half only of a permanent mold, or to the use of a single collapsible or compressible insert in a mold.

Having now described my invention, what I claim and desire to secure by Letters Patent, is:—

1. A permanent mold having its molding surfaces composed in part of a collapsible insert, in combination with means substantially as described for supporting said insert against premature distortion.

2. The combination with a permanent mold having a recess in its molding surface; of a collapsible insert adapted to fit in said recess and close the same, substantially as described.

3. The combination with a permanent mold having a recess in its molding surface; of a collapsible insert adapted to fit in said recess and close the same; and removable means for supporting said insert, substantially as described.

4. The combination with a permanent mold having a recess in the body of the mold extending into its molding surface; of a collapsible insert in said recess; and a support for said insert adapted to be removed from said recess after the casting has set and without removing the casting from the mold, substantially as described.

5. The combination with a permanent mold having a recess in the lower portion of its molding surface; of a collapsible insert adapted to fit in said recess; and removable means for supporting said insert, substantially as described.

6. In a mold flask, the combination of a rigid body portion, and a sand print pocket integral therewith.

7. In a mold flask, the combination of a rigid body portion, a sand print pocket integral therewith, and end walls having bearings for a core in the print pocket.

8. In a mold flask, the combination of two members, a rigid half barrel in each member, a print pocket integral with each member, and a sand print connected with the half barrels located in the said pockets.

In witness whereof, I have hereunto set my hand on the 2nd day of October, 1906.

JOHN H. SHAW.

Witnesses:
JOHN K. BEACH,
M. OLIVE WILLIAMS.