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FOUNDRY MOLD AND THE LIKE

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Fig. 1.

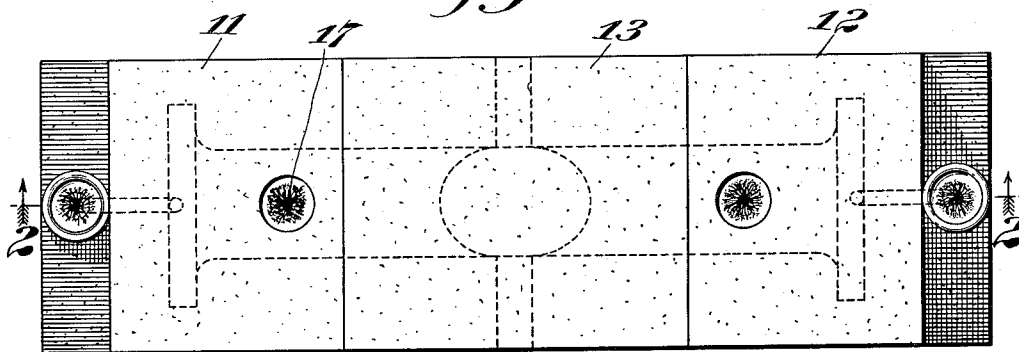


Fig. 2.

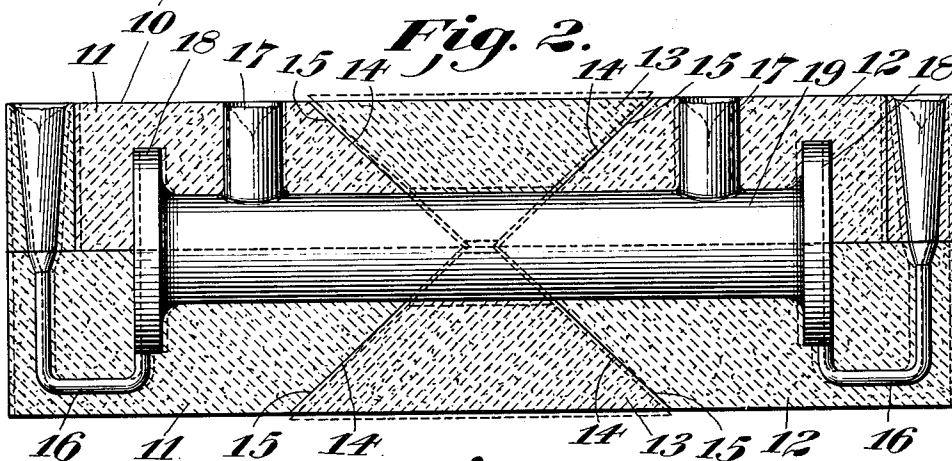
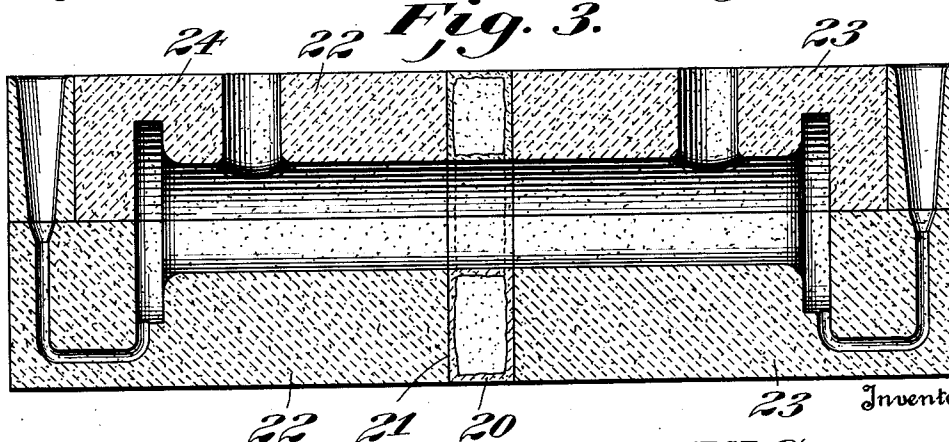


Fig. 3.



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FOUNDRY MOLD AND THE LIKE

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6 Claims. (Cl. 22—113)

This invention relates to improvements in molds for metal castings, and particularly to molds which are formed of a mixture of sand and a hydraulic cement.

5 The casting of certain metal shapes, such as pipes, which have flanged or belled ends, is attended by difficulties not met with in casting other shapes. When a shape such as a pipe having flanged ends is cast, there is the danger
10 that in cooling and contracting, the flanges will break off, due to the great pressure exerted on them by the contraction of the main body of the casting. Attempts have been made in the past to avoid this difficulty by placing some sort of destructible insert, usually combustible, in back of
15 the flanges. The hot metal would destroy the insert, leaving room for longitudinal contraction of the casting.

20 Since the advent of sand and cement molds, this problem of breakage has been even more difficult to cope with. Sand and cement molds, because of their great rigidity, offer more resistance to contraction than the sand or sand and clay molds of the prior art.

25 It is an object of this invention to construct a sand-cement mold for casting flanged and belled shapes which, while possessing the strength and economy of sand-cement molds, will eliminate the danger of broken castings.

30 It is a further object to provide such a mold in which allowance is made for longitudinal contraction of a casting, and the amount of such allowance is governed by and varies with the force exerted by the flanged ends of a casting moving
35 toward each other during contraction of the casting.

The novel features of my invention will be more fully understood from the following description and claims, taken with the drawing, in which

40 Fig. 1 is a side plan view of a mold embodying my invention;

Fig. 2 is a section along the line 2—2 of Fig. 1 and

45 Fig. 3 is a section similar to Fig. 2, showing a modification.

As is well known to those versed in the art, sand-cement molds do not require the heavy flasks needed to support ordinary sand molds. That is, the sand-cement mold may be built up
50 with boxes and patterns, and after the cement has set the mold has sufficient structural strength to stand by itself without external support.

Referring now to the drawing, I have shown a
55 mold intended for use in casting shapes, whether solid or hollow, having a general I-shape. The

mold 10 comprises an upper half and a lower half, each of which is made up of end portions 11 and 12 and intermediate portions 13. Referring to Figs. 1 and 2, it will be seen that the intermediate portions or inserts 13 are of a general wedge-shape, and that the faces 14 of end portions 11 and 12 are disposed at an angle to coincide with and fit against the faces 15 of inserts 13.

Molten metal is poured into mold 10 in any of the usual ways, as through runners 16. Mold 10 may also be provided with the usual heads or risers 17. As the molten metal cools and solidifies, it begins to contract longitudinally, and great pressure is exerted on flanges 18 of casting 19. Were mold 10 of solid, one piece construction considerable strain would be put on the flanges 18, and in many cases flanges 18 would be broken off from the main body of the casting. However, with my construction, the faces 14 and 15 are slidably movable relative to each other. As the casting contracts, the pressure or pull exerted on flanges 18 will tend to draw end portions 11 and 12 of mold 10 towards each other. The shape of insert 13 permits such a movement to take place, insert 13 being wedged or squeezed out by end portions 11 and 12, as shown in dotted lines in Fig. 2. This permits the casting to contract as far as necessary without unduly straining its flanges. In some cases it may be desirable to remove insert 13 as soon as the casting has solidified. This of course may be done readily, as the shape of the insert permits its removal without danger of binding between the end portions, and without disturbing the other parts of the mold.

In the modification of my invention shown in Fig. 3, instead of making inserts 20 of a wedge shape, I construct them with straight or vertical faces 21. However, inserts 20 will be constructed of thin shells 20' of sand and cement, their interiors 20'' being of loose plain sand. As the end portions 22 and 23 of mold 24 are drawn towards each other by the force of the contracting casting, inserts 20 will be crushed, the material of the inserts 20 being moved or forced outwardly, and thus allowing the casting to contract without any undue force being exerted upon the casting.

The advantages of this type mold will be apparent to any one skilled in foundry practice. The danger of cracked castings is greatly reduced. It is not necessary to gauge beforehand what allowance must be made for contraction. My construction is such that just as much allowance will be made for contraction as is needed

ed—no more and no less—for the simple reason that the amount of contraction allowance is determined directly by the casting itself in contracting. In short, my invention consists in a multi-part mold for casting metal articles, in which the intermediate portions of the mold are automatically displaceable in whole or in part to permit free contraction of the casting.

While I have described my invention in considerable detail, I do not wish to be limited to the exact and specific details thereof as herein described, as it will be apparent that numerous variations thereof might be constructed without departing from the spirit and scope of my invention.

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

1. A sand and cement mold for casting flanged metal articles, said mold comprising end portions and intermediate portions, said end portions being adapted to move towards each other in response to pressure exerted by the flanges during contraction of a casting, said intermediate portions being movable relative to said end portions to permit movement of said end portions towards each other.

2. A sand and cement mold for casting flanged metal articles, said mold comprising end portions and wedge-shaped intermediate portions, said intermediate portions being adapted to be displaced by movement of said end portions towards each other during contraction of a casting.

3. A sand and cement foundry mold for casting metal articles, said mold comprising end portions and wedge-shaped intermediate portions,

said intermediate portions being automatically responsive to pressure exerted by contraction of a casting to permit movement of said end portions towards each other during contraction of a casting.

4. A sand and cement foundry mold for casting metal articles, said mold comprising end portions and wedge-shaped intermediate portions, said intermediate portions being displaceable at least in part to permit movement of said end portions towards each other responsive to pressure exerted by contraction of a casting.

5. A sand and cement mold for casting flanged metal articles comprising an upper portion and a lower portion, each of said portions comprising two end sections and an intermediate section, each of said end sections having one face inclined towards the center line of the mold, said intermediate section having two inclined faces registering with the inclined faces of said end sections, said intermediate section and said end sections being slidably movable relative to each other in response to pressure exerted by contraction of a casting.

6. A sand and cement mold for casting flanged metal articles comprising an upper portion and a lower portion, each of said portions comprising two end sections and an intermediate section, said end sections being movable towards each other in response to pressure exerted by contraction of a casting, said intermediate section being slidably movable relative to said end sections to permit movement of said end sections toward each other.

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