Feb. 9, 1926. 1,572,866

F. B. McKUNE

TRANSFER SPOUT

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Fig. 1.

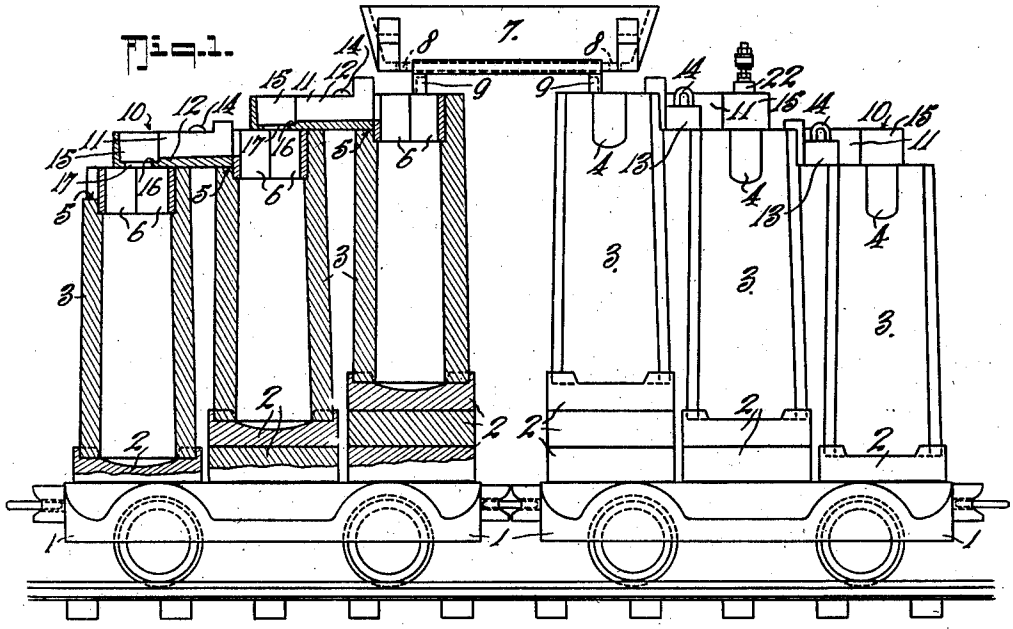


Fig. 2.

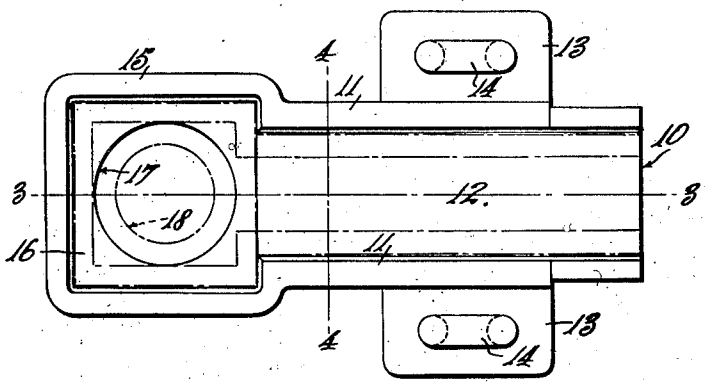


Fig. 3.

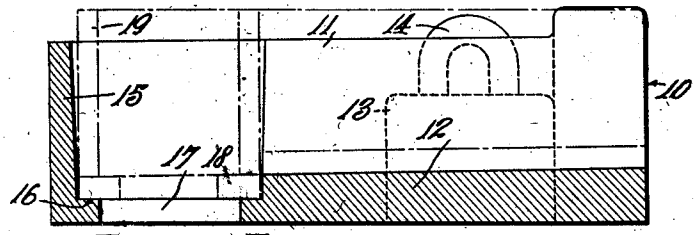
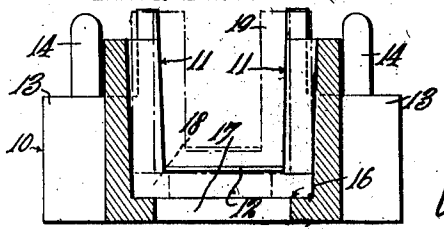


Fig. 4.



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TRANSFER SPOUT

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Fig. 10.

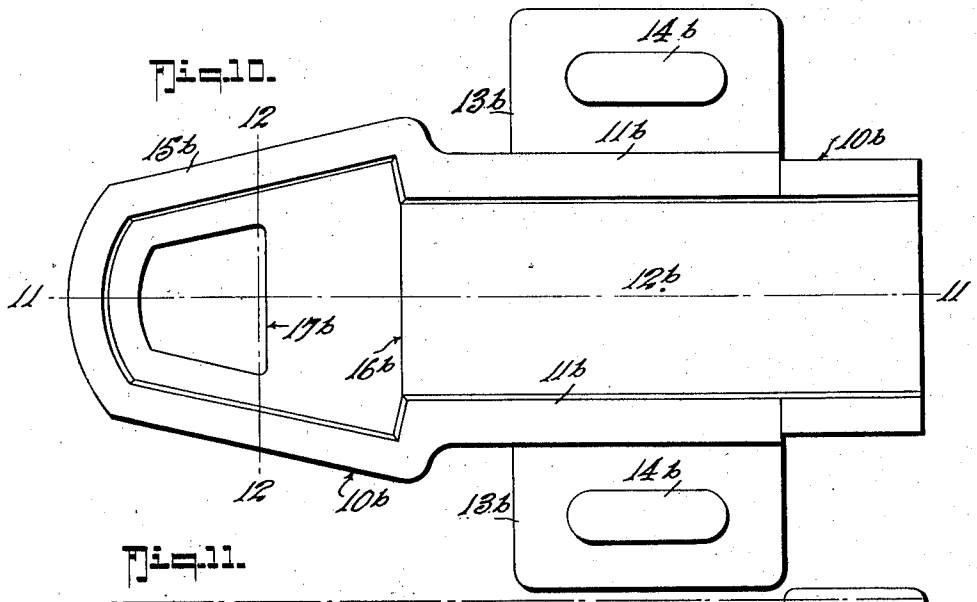


Fig. 11.

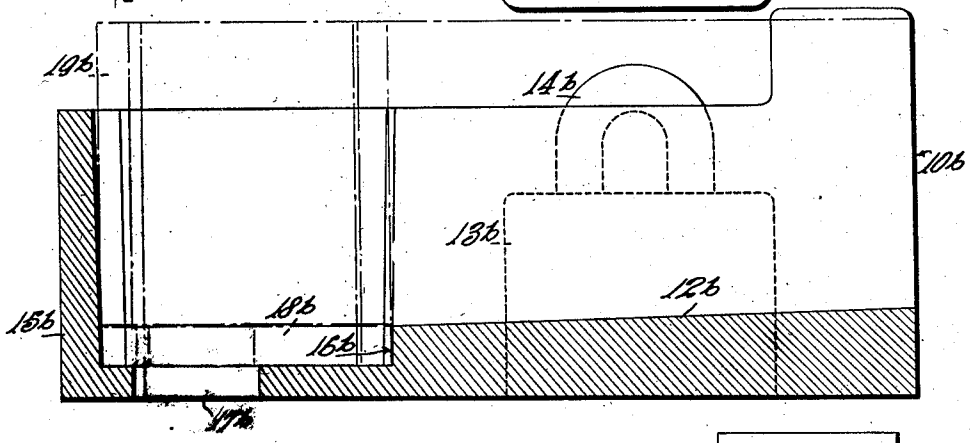


Fig. 12.

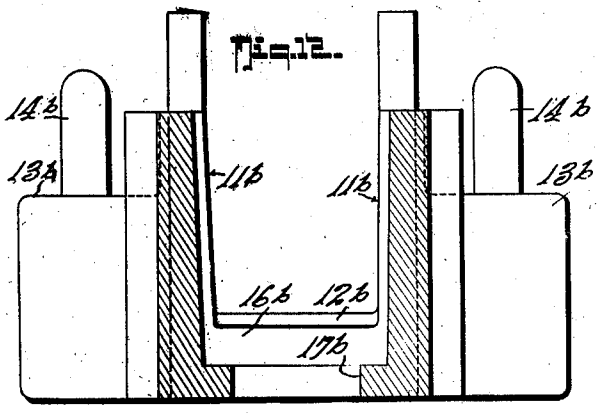


Fig. 5.

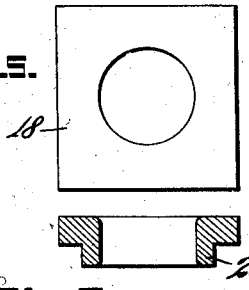


Fig. 6.

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TRANSFER SPOUT

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Fig. 7.

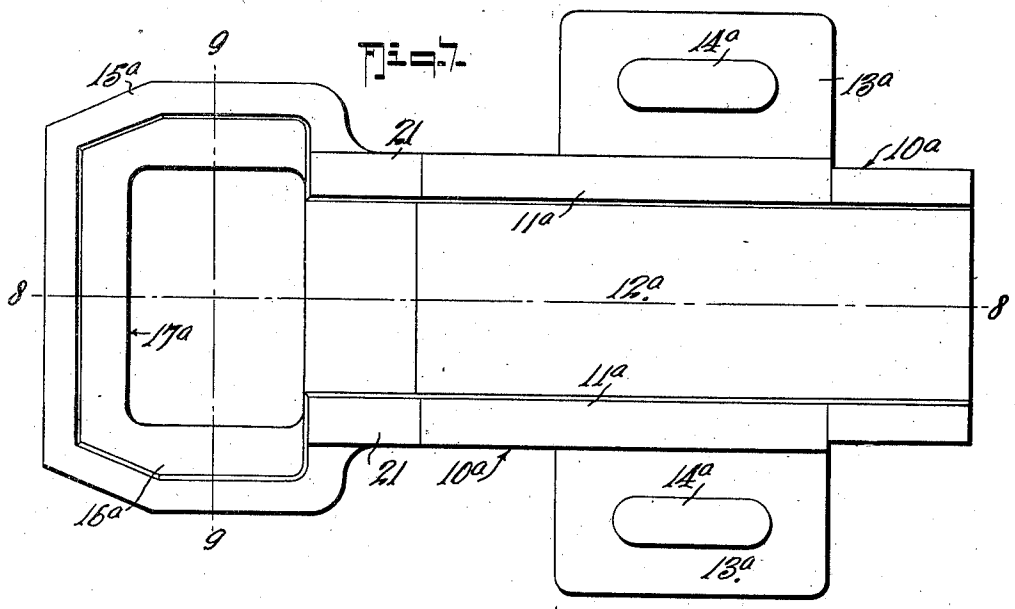


Fig. 8.

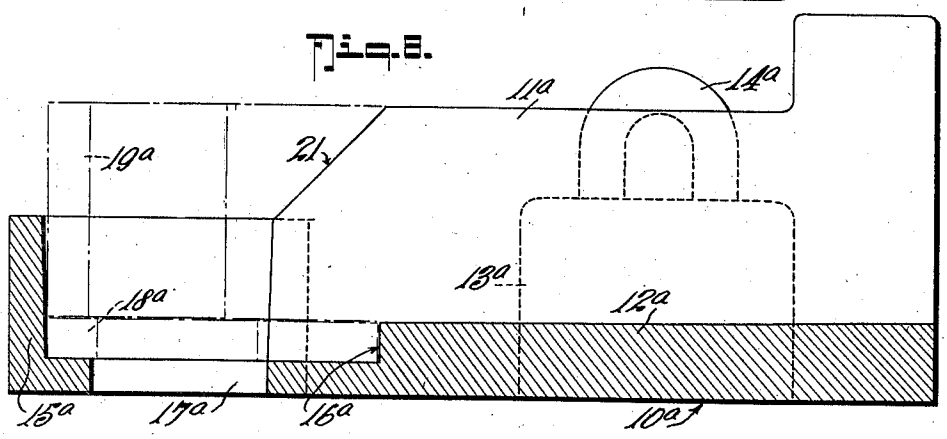
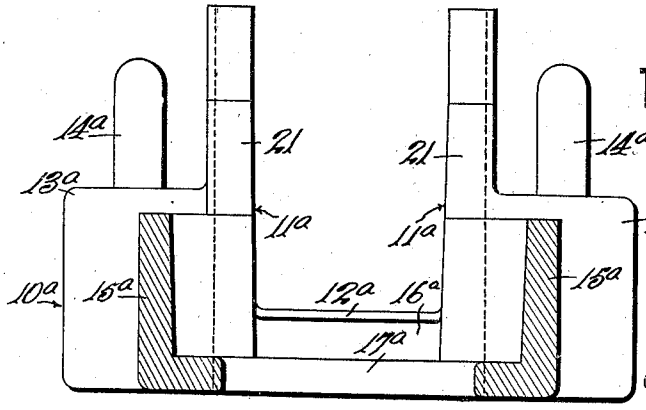


Fig. 9.



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TRANSFER SPOUT

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Fig. 13.

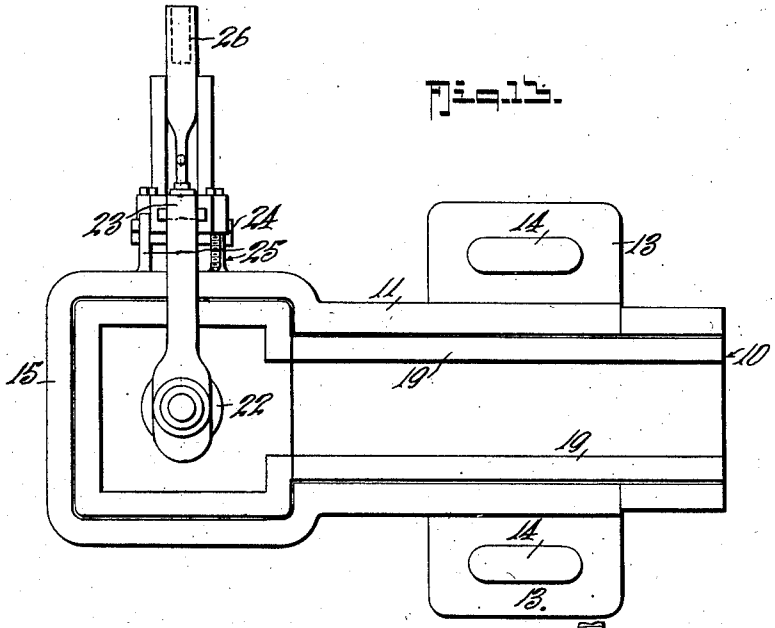


Fig. 15.

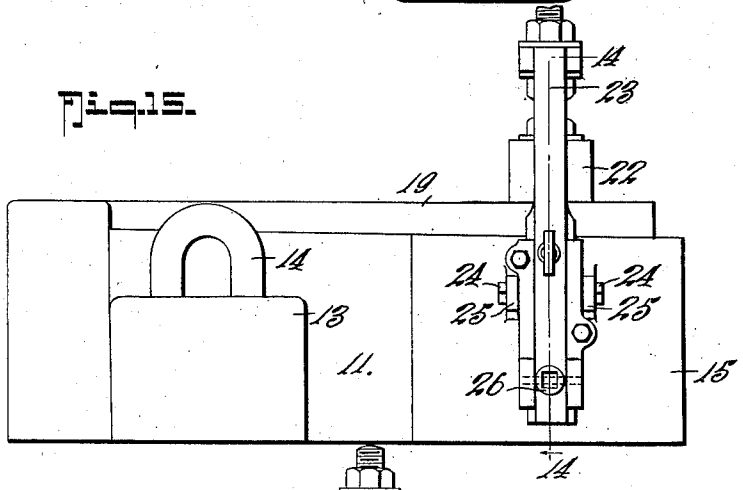
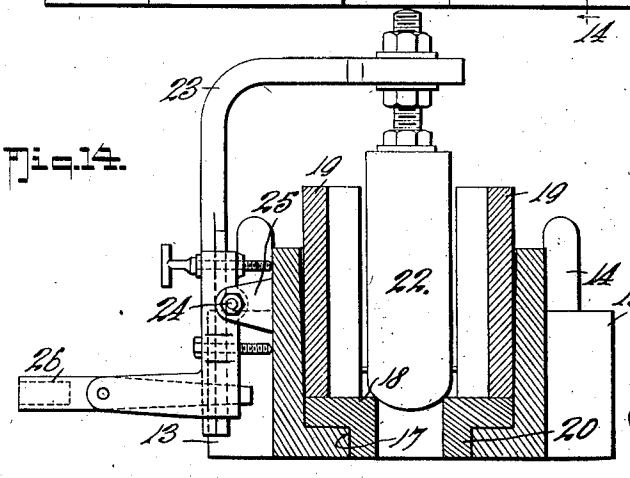


Fig. 14.



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UNITED STATES PATENT OFFICE.

FRANK BAIRD McKUNE, OF HAMILTON, ONTARIO, CANADA.

TRANSFER SPOUT.

Application filed November 21, 1923. Serial No. 676,192.

To all whom it may concern:

Be it known that I, FRANK B. McKUNE, a citizen of the Dominion of Canada, residing at Hamilton, in the Province of Ontario, in the Dominion of Canada, have invented certain new and useful Improvements in Transfer Spouts, of which the following is a specification.

This invention relates to the art of pouring metal in ingot molds by the cascade or continuous flow method disclosed in my application Serial No. 600,942, filed November 14, 1922.

Briefly, in carrying out that method the molds are preferably arranged in stepped series. The metal is poured into one mold continuously until it overflows and fills, successively, all the remaining molds in the series. In passing from one mold to the next mold the metal flows over the transfer spouts.

I have found, in practice, that with the use of small molds i. e. molds having small openings, the stream of molten metal flowing across the transfer spout from a preceding to a succeeding mold sometimes extends over the farther edge of the succeeding mold, and in time destroys the usefulness of the mold as well as causes the ingot to hang in the mold when the spilled or extended metal has solidified. My present invention therefor has for its primary object to provide a transfer spout which will avoid the objections stated as well as to provide means for delivering the molten stream of metal from a preceding mold directly downward into the succeeding mold instead of in a curved stream, thus simulating the stream that flows from the ladle (or the distributing box if such is used) thereby effecting more uniformity in the introduction of the metal to each mold and tending to a more uniform cast in each mold.

Another object of the invention is to provide a transfer spout which can be made at minimum expense; one having adequate provision for receiving a refractory lining or brick and one which can be used over and over again without the necessity of re-lining the same for some time.

In its more subordinate nature the invention also resides in those novel details of construction, combination and arrangement of parts, all of which will be first fully described, and then specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which:

Figure 1 is a diagrammatic elevation illustrating a preferred embodiment of my invention in use in connection with the cascade method of pouring.

Figure 2 is an enlarged plan view of the preferred embodiment of the invention, the lining brick being omitted.

Figure 3 is a vertical longitudinal section on the line 3—3 of Figure 2.

Figure 4 is a cross section on the line 4—4 of Figure 2.

Figure 5 is a detail plan view of the bottom brick shown in Figure 3.

Figure 6 is a vertical longitudinal section of a modified form of the bottom brick.

Figure 7 is a plan view of a slightly different form of spout, the lining brick being omitted.

Figures 8 and 9 are vertical sections on the lines 8—8 and 9—9 of Figure 7 respectively.

Figure 10 is a plan view of still another modified form of spout, the lining brick being omitted.

Figures 11 and 12 are vertical sections on the lines 11—11 and 12—12 of Figure 10 respectively.

Figure 13 is a plan view of one embodiment of my invention provided with a control stopper for the outlet aperture.

Figure 14 is a cross section of the same on the line 14—14 of Figure 13.

Figure 15 is a side elevation of the same.

In the drawings, in which like numerals of reference indicate like parts in all of the figures, 1 represents the car on which the molds are conveyed to and from the furnace room where the metal is poured, 2 represents the mold stools, 3 the molds, 4 the lugs, 5 the mold slots in which the transfer spouts are set, 6 the collars, feeders or hot top bricks of the molds, 7 the distributing troughs having legs 9, and 8 the outlets of the distributing troughs, all of which may be of any desired construction.

The transfer spout constituting the present invention is indicated by the reference numeral 10 and is shown in its preferred form in Figures 2 to 4 inclusive, by refer-

ence to which it will be seen that this transfer spout consists of an elongated trough-like body having upright side walls 11 and a bottom 12 which slants downwardly from the open or receiving end toward the closed or discharge end. The upright wall 11 extends on two sides and one end of the spout as shown.

13 designates side lugs with lifting eyes 14, by means of which the transfer spout can be put in place or removed as desired, the location of the lugs 13 with relation to the center of gravity of the structure as a whole being such that when lifting the trough off the mold the receiving end will tend to raise first and clear the metal of the mold in whose slot it sets while causing the fluid metal remaining in the spout to flow toward the discharge end of the same.

15 is the discharge end of the spout which is preferably laterally enlarged and is provided with a recessed bottom 16 for the discharge hole 17. The recess 16 is provided to receive the bottom brick 18. This brick may be made of one or more pieces and assembled before placing in position in the trough, or it may be built up in the trough by usng ordinary brick, similar in size to building brick. Furthermore it may be made of fire clay, hot top brick material or any other suitable refractory material, and when I use the term "brick" in this application I do not wish to be understood as limiting that term to any particular brick material or to any particular size of brick.

The enlarged discharge end of the spout is also preferably provided with vertical refractory lining 19 which also may be made of one piece or built up of several pieces if desired, it being immaterial to my present invention whether the same is made of one or more pieces and inserted in the assembled state in the spout or whether it be built up in the spout.

The bottom brick 18 may be a simple flat brick as shown in Figures 3 and 5 or it may be a flanged brick, as shown in Figure 6, in which event the flange 20 will set into the hole 17 and protect the edges of the metal of the spout there.

In the embodiment of the invention shown in Figures 7, 8 and 9 it will be observed that the upright wall 11^a constituting the discharge end of the spout is lowered, as at 21, in order to reduce weight and save material of the spout, the required height being obtained by the lining brick used. In this embodiment of the invention those parts corresponding to similar parts in the preferred embodiment bear the same reference characters plus the index letter "a."

In the embodiment shown in Figures 10 to 12 inclusive, the parts which correspond in purpose and function to similar parts in the preferred form of the invention bear the same reference characters plus the index letter character "b."

From the foregoing it will be seen that by the use of my new form of transfer spout the flowing stream of metal in passing from a higher to a lower mold is caught by the end wall of the spout and held back from spilling over the further edge of the mold through which it discharges and it also serves to direct the molten stream straight down from the transfer spout into the mold instead of through a curved trajectory as with the use of my former spout.

The size of the discharge hole of the spout will be regulated to permit the flow of metal through the same at a proper rate to prevent the metal rising to an unsafe depth in the spout and the diameter of the discharge hole of the spout will depend somewhat on the diameter of the discharge hole of the ladle or transfer box as will be clear to those skilled in the art.

I may also provide the spout with a stopper 22 carried on an arm 23 of a lever which is pivoted at 24 to a bracket 25 on the side of the spout and which has a socketed arm 26 for receiving a long rod by which the lever may be operated to raise and lower the stopper, whose construction is particularly disclosed in Figures 13 to 15, inclusive.

From the foregoing description, taken in connection with the accompanying drawings, it is thought the complete construction, uses and advantages of my invention will be readily clear to those skilled in the art.

What I claim is:

1. A transfer spout comprising an elongated trough-like body having side walls and one end wall, said body having a discharge hole in its bottom adjacent to the end having the end wall, the bottom of the spout inclining downwardly toward said hole, lateral lugs with lifting eyes located at the sides of said body near the end opposite that with the hole.

2. A transfer spout comprising an elongated trough-like body having side walls and one end wall, said body having a discharge hole in its bottom adjacent to the end having the end wall, the bottom of the spout inclining downwardly toward said hole, said body having a depression in its bottom surrounding said hole and brick held in said depression with a hole registering with the hole in said body.

3. A transfer spout comprising an elongated trough-like body having side walls and one end wall, said body having a discharge hole in its bottom adjacent to the end having the end wall, the bottom of the spout inclining downwardly toward said hole, lateral lugs with lifting eyes located at the sides of said body near the end opposite that with the hole, said body having a depression in its bottom surrounding said hole

and brick held in said depression with a hole registering with the hole in said body.

4. A transfer spout comprising an elongated trough-like body laterally enlarged at one end, said end being surrounded by an upright wall to stop the flow of metal, said body having a discharge hole in the bottom of said enlarged end, a refractory covering for the bottom of the enlarged end of said body, and a stopper mechanism mounted on the spout for controlling the flow through the discharge hole.

FRANK BAIRD McKUNE.