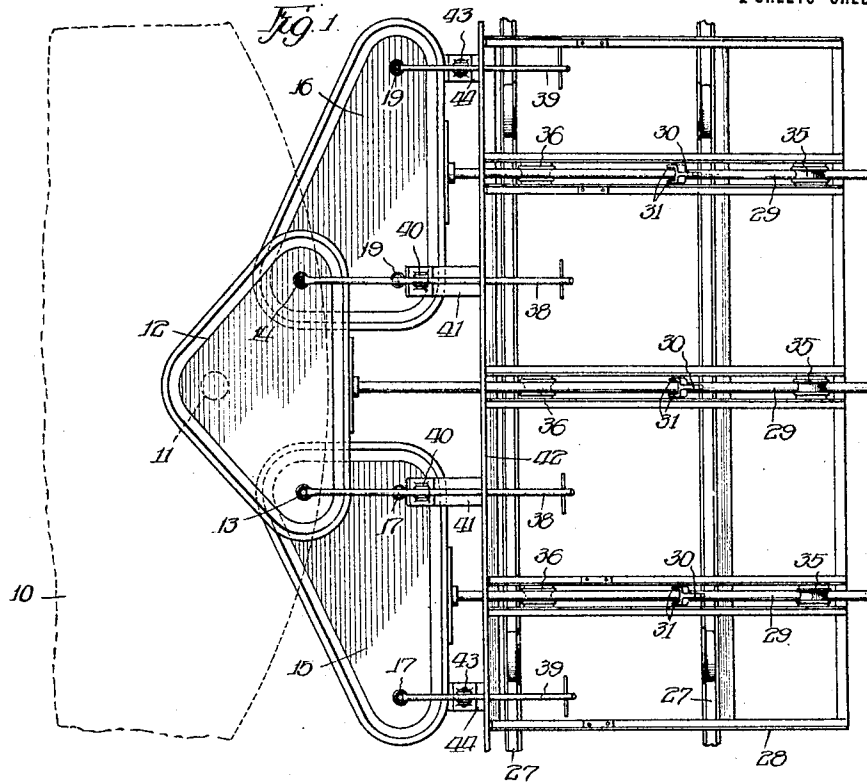
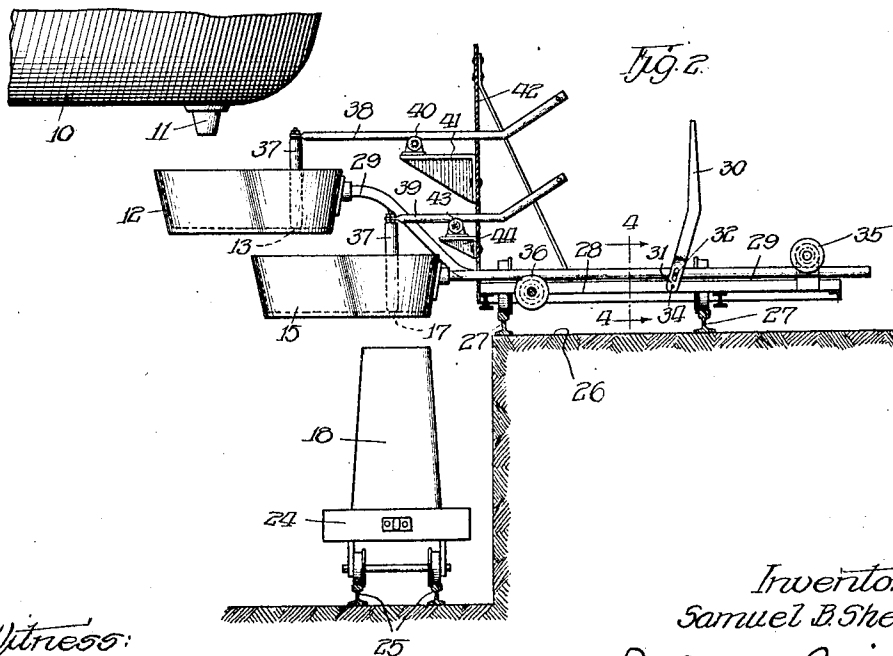


S. B. SHELDON.
 INGOT POURING MECHANISM.
 APPLICATION FILED FEB. 11, 1920.

1,401,928.

Patented Dec. 27, 1921.

2 SHEETS—SHEET 1.



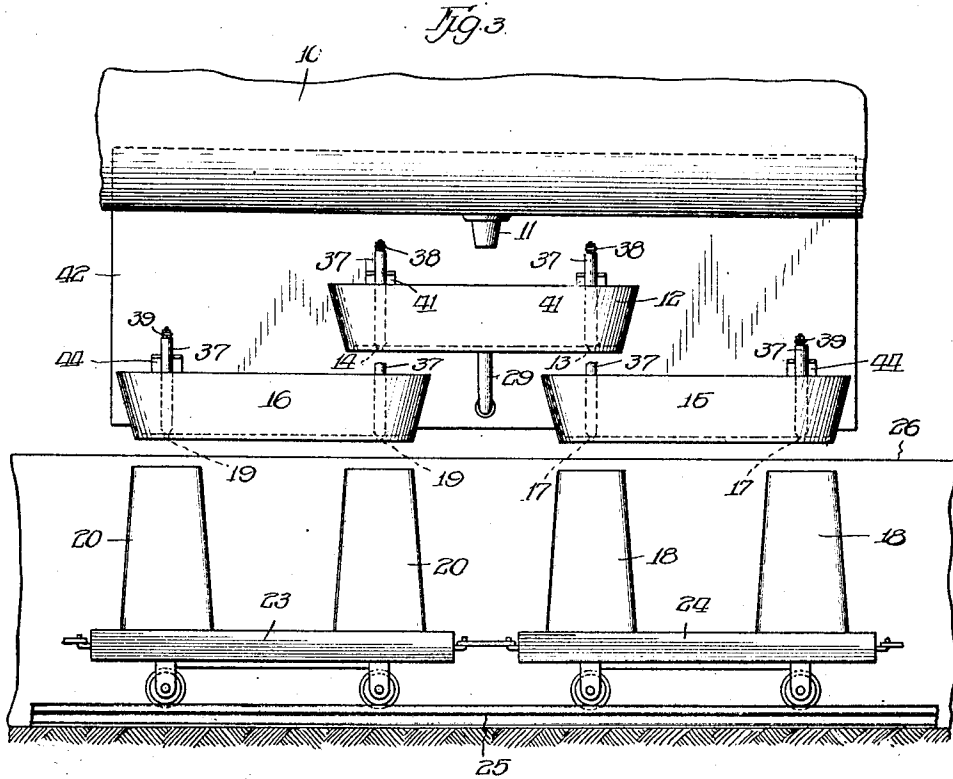
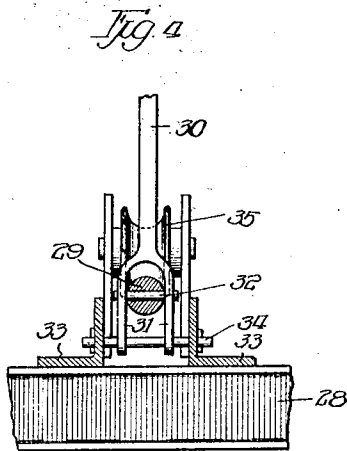
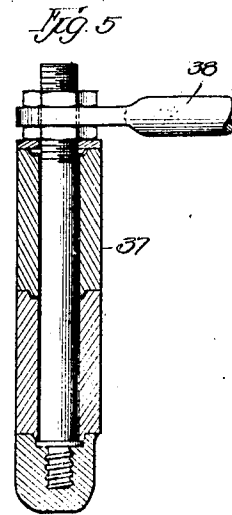
Witness:
 R. Burkhardt.

Inventor:
 Samuel B. Sheldon,
 By D. Anthony Osina
 Atty.

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UNITED STATES PATENT OFFICE.

SAMUEL B. SHELDON, OF DULUTH, MINNESOTA.

INGOT-POURING MECHANISM.

1,401,928.

Specification of Letters Patent.

Patented Dec. 27, 1921.

Application filed February 11, 1920. Serial No. 357,877.

To all whom it may concern:

Be it known that I, SAMUEL B. SHELDON, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Ingot-Pouring Mechanism, of which the following is a specification.

This invention relates to ingot pouring mechanism.

One object of the invention is to provide improved means whereby one or more ingots may be poured at a time, and whereby the flow of the molten metal to one or more ingot molds may be controlled in a simple and efficient manner.

Another object is to provide simple and efficient means whereby the length of a plurality of ingots being poured may be equalized and whereby selectively one, two, three, four or more ingots may be poured at a time.

Another object is to provide simple and efficient ingot pouring mechanism wherein the parts cooperate to meet the various requirements for successful commercial operation.

These and other objects are accomplished by means of the ingot pouring mechanism disclosed on the accompanying sheets of drawings, in which—

Figure 1 is a top plan view of my improved ingot pouring mechanism, the associated casting ladle being shown in dotted lines;

Fig. 2 is a side elevation of the same, some parts being shown in section, a portion of the associated casting ladle also being shown;

Fig. 3 is a front elevation of the same arrangement;

Fig. 4 is a detail sectional view taken in the plane of line 4—4 of Fig. 2; and,

Fig. 5 is a longitudinal sectional view of one of several stoppers which form a part of the mechanism.

The various novel features of the invention will be apparent from the following description and drawings and will be particularly pointed out in the appended claims.

It may be stated preliminarily that the pouring mechanism is located below a casting ladle which receives its charge of molten metal from an open hearth furnace, or any other suitable source, said pouring mechanism also being located above the ingot

molds into which the molten metal is to be poured, the primary function of the ingot pouring mechanism being to subdivide the single stream of molten metal which issues from the casting ladle into a plurality of streams directed into the underlying ingot molds, the flow of molten metal being controlled in a manner whereby the streams of metal may be poured into one or more of a plurality of ingot molds and whereby when a plurality of streams of molten metal are directed into the underlying ingot molds, the relative quantity of flow may be accurately controlled. The pouring mechanism, which is interposed between the casting ladle and ingot molds, is movable along a pouring platform to locate same over any group of molds, and is also adjustable in the other direction transversely of the pouring platform and with respect to the casting ladle and the ingot molds for securing the proper relative positioning of the members in question.

Referring to the figures of the drawings, it will be noted that I have shown a casting ladle 10 which, as stated above, may receive its supply of molten metal from any suitable source, said casting ladle having an outlet nozzle 11 which, when the parts are in operative position, is located over a primary pouring trough or box 12 having a plurality of nozzles 13 and 14 through which molten metal may pass into two secondary pouring troughs or boxes 15 and 16, each of which has two nozzles, the nozzles 17 of pouring trough 15 in the arrangement shown being located over ingot molds 18, and the nozzles 19 of pouring trough 16 being located directly over the ingot molds 20. As is usual, the ingot molds are mounted upon cars 23 and 24 movable on tracks 25 located below and adjacent the pouring platform 26 having tracks 27 upon which a truck 28 may travel lengthwise of the pouring platform, said truck 28 bodily carrying all of the pouring mechanism, which is located intermediate the casting ladle and the ingot molds. The secondary pouring troughs, and also the primary pouring trough, in each case are carried at the end of a lever or rod 29 which is movable transversely of the truck and of the pouring platform for adjusting the troughs laterally with respect to the pouring platform, ingot molds and casting ladle. For making this adjustment I have provided the rods 29 in each case with a lever 30, the lower end of

which is forked to receive between the legs 31 thereof the associated rod 29, the rod 29 and legs 31 of the lever being pivotally connected to each other by a pin 32 extending 5 through the parts in question. The lower ends of the legs 31 are pivotally connected to frame members 33 of the truck by a pin 34 which acts as a fulcrum about which the lever 30 swings, whereby the rod 29 in each 10 case may be moved inwardly and outwardly for the purposes described. In each case the rod 29 is supported on the truck by a roller 35 mounted over the rod at the rear side of the truck and by a roller 36 mounted 15 under the rod 29 at the front side thereof. The front end of the lever to which the primary trough is attached is bent upwardly for positioning the primary trough 12 under ladle nozzle 11 and over the secondary pouring 20 troughs 15 and 16. In this connection it will be noted that the primary pouring trough is triangular in plan with one corner of the trough being presented under the ladle nozzle 11. Also it will be noted that the sec- 25 ondary pouring troughs are triangular in shape and that the nozzles 13 and 14 of the primary trough are located over adjacent corners of said secondary pouring troughs. In this way the lengths of the troughs are 30 reduced to a minimum and at the same time the point of introduction of the molten metal into each trough is spaced from the outlet nozzles of each trough.

As mentioned hereinabove, it is desirable 35 to control the flow of the streams of molten metal from the primary pouring trough into the secondary pouring troughs, and from the secondary pouring troughs into the underlying ingot molds. To accomplish this func- 40 tion I have provided a plurality of stoppers 37 which are supported at the ends of levers 38 and 39. The levers 38 are fulcrumed upon rollers 40 mounted on brackets 41, which are secured to a protecting plate 42 mounted on 45 the truck, and the levers 39 likewise are fulcrumed upon rollers 43 mounted upon brackets 44 secured to the same protecting plate 42. As shown in the figures of the drawings, the stoppers 37 are in positions closing noz- 50 zles 13, 14, 17 and 19. It is apparent that if it is desirable to have the molten metal, which flows from the casting ladle 10 into the primary pouring trough 12, divided into four streams for pouring four ingots, all of 55 the stoppers 37 will be raised by pushing downwardly upon the free ends of the levers 38 and 39. However, if it is desirable to pour but two ingots, for example, into molds 18, only one of the stoppers of the primary 60 pouring trough would be raised, whereupon a single stream of metal would flow from said primary trough into only one of the secondary troughs, from which two streams of molten metal would flow if both of the stop- 65 pers in the particular secondary trough were

raised. If, however, it was desirable to have but a single stream of molten metal flow from a secondary trough, only one of the stoppers therein would be raised. From this arrangement it is perfectly obvious that the 70 relative rates of flow of the molten metal through the nozzles of the primary trough may be controlled by the degree of opening provided by raising the associated stoppers the desired amount, and likewise the relative 75 rates of flow through the nozzles of the secondary troughs may be controlled in the same manner. It will be noted that in each case the primary and secondary pouring troughs are not tilted and that the control 80 is effected entirely by raising and lowering the stoppers. By means of this pouring mechanism a simple and efficient arrangement is provided for controlling the relative rates of flow through the nozzles of all of the 85 pouring troughs in a manner to meet all of the requirements for successful commercial operation.

It is my intention to cover all modifications of the invention falling within the 90 spirit and scope of the following claims.

I claim:

1. Ingot pouring mechanism comprising a trough adapted to receive molten metal from a casting ladle or the like and having 95 a plurality of discharge nozzles, means independent of the tilting of said trough for controlling the discharge of metal through the nozzles thereof, and additional troughs located beneath each discharge nozzle of the 100 first trough.

2. Ingot pouring mechanism comprising a trough adapted to receive molten metal from a casting ladle or the like and having 105 a plurality of discharge nozzles, means independent of the tilting of said trough for controlling the discharge of metal through the nozzles thereof, additional troughs located beneath each discharge nozzle of the 110 first trough, and means independent of the tilting of said additional troughs for controlling the flow of metal through the nozzles thereof.

3. Ingot pouring mechanism comprising a trough adapted to receive molten metal 115 from a casting ladle or the like and having two discharge nozzles, means independent of the tilting of said trough for controlling the discharge of metal through the nozzles thereof, two additional troughs supported, 120 respectively, beneath the two nozzles of the first trough, each of said additional troughs having two discharge nozzles, and means independent of the tilting of said additional troughs for controlling the flow of molten 125 metal through the nozzles thereof.

4. In ingot pouring mechanism, the combination of a carriage adapted to travel along a pouring platform, a trough having 130 a plurality of discharge nozzles and sup-

ported by said carriage and adapted to receive molten metal from a casting ladle or the like, means mounted on said carriage independent of the tilting of said trough for controlling the flow of metal through the discharge nozzles thereof, and means for adjusting the position of said trough with respect to said carriage.

- 5 5. In pouring mechanism, the combination of a carriage movable along the pouring platform, a trough having a plurality of discharge nozzles and adapted to receive molten metal from a casting ladle or the like, stoppers associated with said discharge nozzles, levers mounted on said carriage and connected to said stoppers for moving said stoppers to control the flow of metal through said nozzles, and means for moving said trough relative to said carriage.
- 10 6. In ingot pouring mechanism, the combination with a casting platform adjacent to a plurality of ingot molds to be poured and a bottom pour casting ladle movable over the molds, of a distributing trough extending over a plurality of molds and having a plurality of bottom pour discharge nozzles and adapted to receive molten metal from the ladle and subdivide it into a plu-

30 rality of streams, means for supporting the trough for bodily movement to maintain its position beneath the ladle and between the ladle and the molds in different pouring positions of the ladle, and means independent of the tilting of the trough to vary the relative rates of pour through its discharge nozzles.

- 35 7. In pouring mechanism, the combination with a movable bottom pour casting ladle and a plurality of ingot molds to be poured, of a distributing trough normally located beneath the ladle and between the ladle and molds and having a plurality of bottom pour discharge nozzles and adapted to receive the stream of molten metal from the ladle and subdivide it into a plurality of secondary streams, a mounting for the trough permitting bodily movement of the trough in line with the ladle to maintain it in its position between the ladle and molds in different pouring positions of the ladle, and means independent of the tilting of the trough for varying the relative rates of pour through its discharge nozzles.

Signed at Duluth, Minnesota, this 6 day of February, 1920.

SAMUEL B. SHELDON.