

F. W. TRACY.
CASTING APPARATUS.
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1,017,707.

Patented Feb. 20, 1912.

Fig. 1.

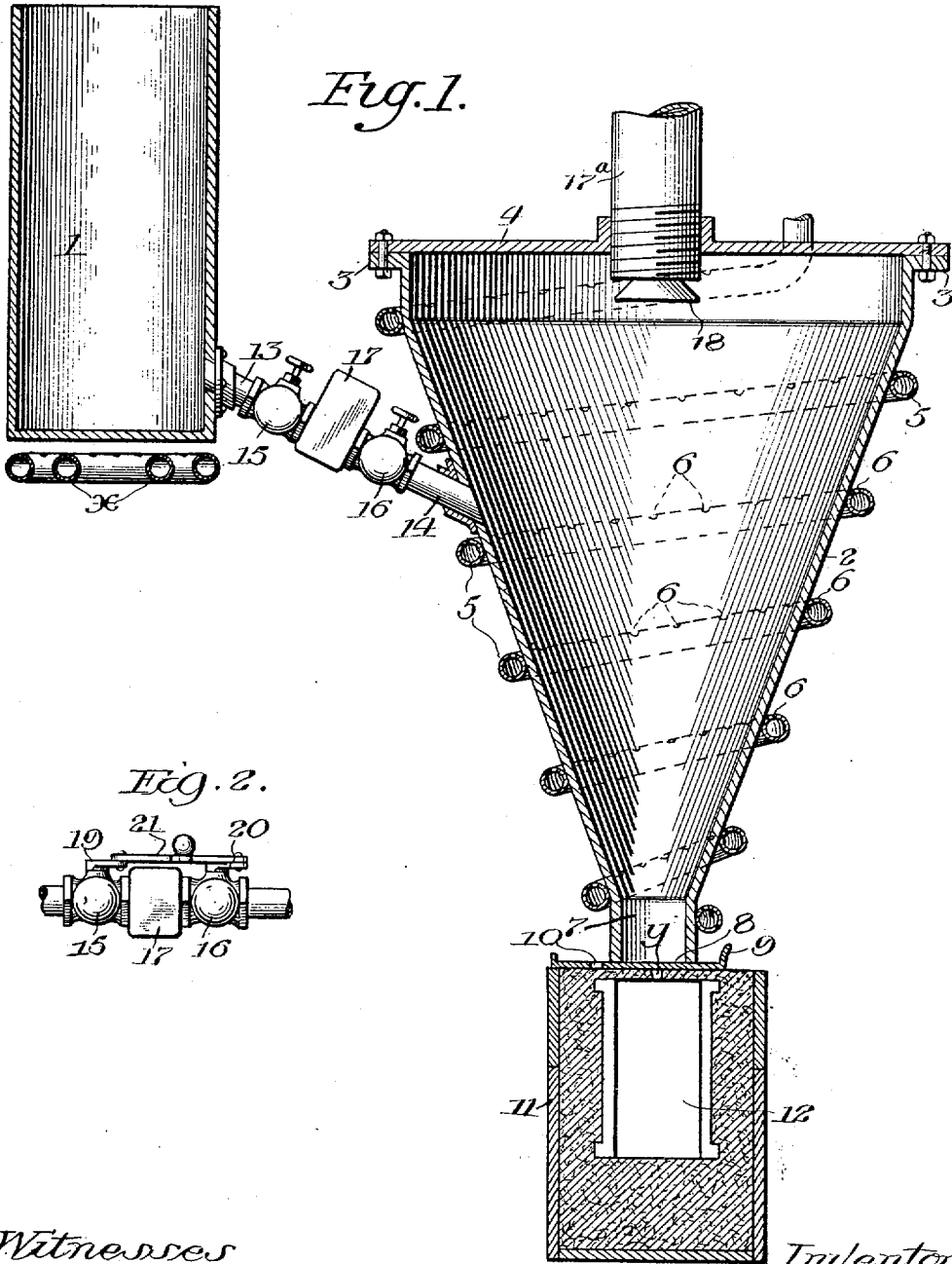
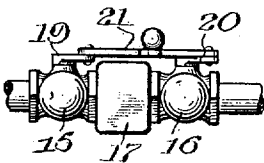


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANK W. TRACY, OF CHICAGO, ILLINOIS.

CASTING APPARATUS.

1,017,707.

Specification of Letters Patent.

Patented Feb. 20, 1912.

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To all whom it may concern:

Be it known that I, FRANK W. TRACY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Casting Apparatus, of which the following is a full, clear, and exact description.

My invention relates to a device for casting under pressure, and more particularly to devices for making castings into metal molds and its principal object is to provide means that will make these castings in such manner that the formation of bubbles or holes in the same is successfully avoided. These bubbles are usually caused where compressed air is applied to the flask to force the molten metal to all parts of the mold, and are very objectionable because of the additional labor necessary to remedy the same after the finished casting has been cooled.

Another object of my invention is to provide suitable means for feeding the molten material to a heated crucible in the exact quantities needed for each mold and keeping the same heated prior to being emptied into the flask.

These objects I accomplish by the means and in the manner hereinafter fully described and as more particularly pointed out in the claims, reference being had to the accompanying drawings, forming a part hereof, in which:—

Figure 1 is a central vertical section of my invention, showing the same partly in diagrammatical form. Fig. 2 is a side elevation of a slightly modified construction of the valve-operating mechanism.

Referring to the drawings, 1 represents a receptacle that may be of any suitable shape and dimensions in which the metal is melted by burners *x* prior to being fed to the crucible 2. This crucible 2, is preferably hopper or funnel-shaped, substantially shown in the drawings, and may be made of any suitable dimensions, according to the requirements of the apparatus. The upper edge of this crucible has a laterally projecting annular flange 3, and the open upper end is closed by means of a top-plate or head 4, that is secured thereto by bolts or rivets that pass through said flange. Surrounding the exterior of the crucible is a spirally coiled pipe 5, the coils of which are preferably about two inches apart and which are

connected to a suitable source of gas supply (not shown). The upper segments of these coils are provided with a plurality of perforations that provide gas jets 6, 6, which, when lighted will heat the crucible to a high temperature. The lower portion or inverted apex of the crucible preferably merges into and forms a comparatively narrow neck having an outlet passage 7. This neck is preferably cylindrical in shape, and the opening in its lower end is closed by a suitable sliding cut-off or choke-plate 8 that is movable transversally across the same. One end of this plate is bent laterally to form a lip that prevents its withdrawal while its opposite end is provided with an operating handle 9, and mediate its ends is provided with an opening 10. Below plate 8 the usual molding flask 11 is disposed which contains the mold and which may be of any of the well known constructions, which in the drawing is shown to contain a bearing 12 to which the metal is poured through an opening *y* when opening 10 is brought into register therewith.

A suitable opening is made through the walls of the lower portion of the receptacle 1, and an oblique or slanting stub 13 is tapped therein. In axial alinement therewith a similar stub 14 is similarly tapped into and through the side wall of the crucible 2. These stubs are connected to valves 15 and 16 respectively, which are preferably adapted to be operated independently of each other and in alternate order and a suitable chamber 17 of variable size is removably mounted between the same. The valves are adapted to operate so that when the material is to be removed from the receptacle 1 and fed into the crucible, the right hand or lower valve 16 is closed and the left-hand valve 15 is opened to permit the metal to fill chamber 17. The next step is to close valve 15 and open valve 16 whereupon the material, which, on account of the size of chamber 17 is the exact amount needed for the mold, will gravitate through stub 14 into the crucible. This manner of operating the valves permits the chamber being filled to the exact amount necessary for the mold before the same is emptied into the crucible as one or the other of the valves is kept closed at all times.

In operation, the valves 15 and 16 are operated to admit the required quantity of metal to the crucible and the gas jets being

lighted the crucible is kept heated to a high temperature so that the metal is kept melted. The choke-plate 8 is moved so as to register openings 10 and γ and the material gravitates into the flask. Compressed air is then turned into the crucible through the medium of the pipe 17^a and specially formed header 18. The construction of this header 18 is similar to that set forth and illustrated in Letters Patent of the United States granted to me June 22, 1909, No. 926,037, and by reference to the same, it will be seen that the compressed air does not strike the molten metal in a direct stream, but is projected from the header at an angle to the axis thereof so that the same is distributed equally in different directions upon the molten metal. This prevents the blowing of holes or bubbles in the molten mass and at the same time forces the metal into every corner and crevices of the mold.

In the modification shown in Fig. 2, valves 15 and 16 are "quick-opening" valves and have their spindles 19 and 20 provided with lateral projections and the outer ends of the same are connected by means of a link 21. This is for the purpose of simultaneously operating the valves by reciprocating the rod 21 in one direction or the other, and the same is so timed that valve 15 will be opened when valve 16 is closed, and vice versa.

What I claim as new is:—

1. A casting apparatus comprising a closed crucible, a flask below said crucible the sprue of which is in register with the gate of said crucible, means for supplying molten metal to said closed crucible consisting of a measuring chamber and alternating operative valves controlling the feed and discharge of said chamber, and devices for supplying air under pressure to said crucible and forcing the molten metal into said flask.

2. A casting apparatus comprising a closed crucible, a flask below said crucible the sprue of which is in register with the gate of said crucible, means for supplying molten metal to said closed crucible in fixed

quantities consisting of a measuring-chamber and alternately operative valves one at the inlet and one at the outlet of said chamber that regulate the feed and discharge of said chamber, and devices for supplying air under pressure to said crucible and forcing the molten metal into said flask.

3. A casting apparatus comprising a closed crucible, a flask below said crucible the sprue of which is in register with the gate of said crucible, means for supplying molten metal to said closed crucible consisting of a measuring chamber and alternating operative valves controlling the feed and discharge of said chamber, heating devices surrounding said crucible, and devices for supplying air under pressure to said crucible and forcing the molten metal into said flask.

4. A casting apparatus comprising a closed crucible, a flask below said crucible the sprue of which is in register with the gate of said crucible, means for supplying molten metal to said closed crucible in fixed quantities consisting of a measuring-chamber and alternately operative valves one at the inlet and one at the outlet of said chamber that regulate the feed and discharge of said chamber, heating devices surrounding said crucible, and devices for supplying air under pressure to said crucible and forcing the molten metal into said flask.

5. A casting apparatus comprising a closed crucible having a tapered lower portion, a flask below said crucible the sprue of which is in register with the gate of said crucible, means for supplying molten metal to said crucible in fixed quantities, heating coils surrounding the tapered portion of said crucible, and devices for supplying air under pressure to said closed crucible and forcing the metal into said flask.

In witness whereof I have hereunto set my hand this 6th day of March 1911.

FRANK W. TRACY.

Witnesses:

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