No. 702,194. Patented June 10, 1902.

H. H. FRANKLIN.

CASTING APPARATUS.

(Application filed Sept. 20, 1901.)

(No Model.)

Fig. 1.

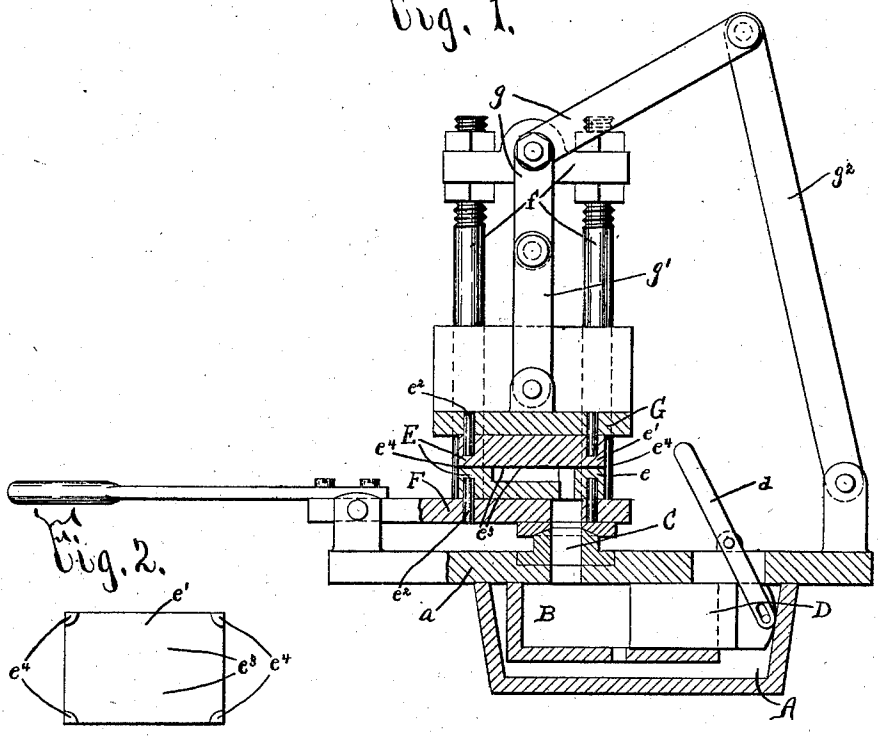


Fig. 2.

Fig. 3.

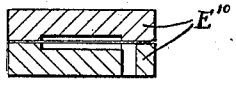


Fig. 4.

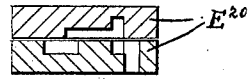


Fig. 5.

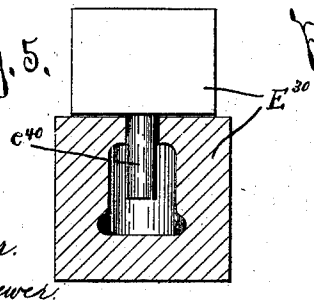
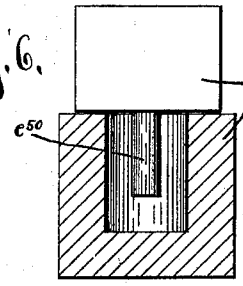


Fig. 6.



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CASTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 702,194, dated June 10, 1902.

Application filed September 20, 1901. Serial No. 75,918. (No model.)

To all whom it may concern:

Be it known that I, HERBERT H. FRANKLIN, of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Apparatus for Casting, of which the following is a specification.

My invention has for its object the production of an apparatus for casting which facilitates the escape of the air from the mold and is particularly practical and effective in use; and to this end it consists in the combinations and devices hereinafter described and claimed.

In describing this invention reference is had to the accompanying drawings, forming part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is a sectional view, partly in elevation, of a preferred embodiment of my casting apparatus. Fig. 2 is an inverted plan view of one of the sections of the mold seen in Fig. 1. Figs. 3 and 4 are sectional views of detached molds, having contiguous surfaces of their sections separated in accordance with my invention. Figs. 5 and 6 are sectional views, partly in elevation, of molds of modified construction, having contiguous surfaces of their sections separated.

In the casting of type and other articles of metal in metal molds it is well known that the air in the molds and the air and other gases introduced with the metal to be cast are not expelled from the molds, but become more or less mixed with said metal, causing "blow-holes." Especially is this true when the metal is introduced quickly and under pressure. The specific gravity of a given bulk of type or metal cast in this manner is less than the specific gravity of an equal bulk of the metal. The air may be compressed and diffused through the metal so finely that the bubbles or blow-holes are not perceptible except under a magnifying-glass, or the bubbles may be less numerous, and consequently larger. In either case the strength of the casting is less than if it were solid and of natural specific gravity. Furthermore, the air in the mold increases the difficulty of the casting operation by preventing the easy and satisfactory entrance of the metal to all parts of the mold.

If the metal is introduced rapidly, as is usual when pressure is employed, it is apparent that in order to expel the air from the mold by displacement there must be a free outlet. When this outlet is sufficiently large to permit a free displacement of the air, the metal will also enter the outlet, or, in other words, will escape from the mold. Aside from the annoyance incidental to the escape of the metal a projection or rough place is left to be finished. In the case of type this method of casting would be impracticable, and in casting articles of varied shapes and sizes it would be difficult to so locate an outlet as to permit the full escape or displacement of the air.

By my invention contiguous surfaces of the parts or sections of the mold are separated, and said parts or sections are held rigidly in position, thus permitting the air and other gases to escape from all parts of the mold at the parting or opening lines without disfiguring the casting. The amount of separation of the contiguous surfaces of the parts or sections of the mold is dependent upon the size and shape of the casting, the amount of pressure applied, and the speed of introduction of the material to be cast. In many cases a separation of three-thousandths of an inch is sufficient. If extreme pressure is used for forcing the metal into the mold, a less separation of the contiguous surfaces of the sections of the mold will be sufficient. The ready displacement of the air is due to the fact that it is free to escape from all portions of the parting or opening lines of the mold and is not required to pass from some particular part of the mold, as an end or side or a portion thereof.

In the preferred embodiment of my invention, A is a source of supply for the metal to be cast. B is a chamber communicating with said source of supply.

C is a discharge-nozzle leading from the chamber B.

D is a plunger for forcing the material to be cast from the chamber B through the discharge-nozzle C.

E is a sectional mold, and G F are opposite supports for the parts or sections of the mold.

The source of supply A may be heated by

any desirable means, is partly filled with the material to be cast, and is shown as depending from a plate *a*, from which the chamber B also depends within said source of supply. The discharge-nozzle C projects upwardly from said plate *a* and is generally provided with a tapering upper end. Said plunger D may be operated by any suitable means, as a hand-lever *d*.

The sectional mold E may be of any desirable construction and is here illustrated as composed of opposite parts or sections *e e'*, Fig. 1, which are arranged between contiguous surfaces of the supports F G, are respectively secured to these supports by any suitable means, as dowel-pins e^2, and are rigidly held in position with contiguous surfaces e^3 thereof slightly separated. The amount of separation of the surfaces e^3 may be determined by feet or projections e^4 of small height extending from portions of one section, as the corners thereof, and engaging the contiguous surfaces of the other section. Said feet or projections e^4 may be dispensed with, if desired. These supports F G may be of any desirable form, size, and construction and may be supported in any suitable manner. The support F is here shown as pivoted to the plate *a* and as provided with means, as a standard *f*, for guiding the support G and means, as a lever *g*, connected to the support G for moving the same toward and away from the portion of the support F upon which the part or section *e* of the mold E is mounted. Said standard *f* usually extends at an angle with the main portion of the support F, and its upper part may be adjustable lengthwise of the remaining part of the standard. The lever *g* is pivoted to the standard *f*, and one end thereof is connected by a link *g'* to the support G, and its other end may be actuated by hand or by a link g^2, pivoted to said lever and to the plate *a*. When the lever *g* is in its operative position, the pivots for connecting the lever *g* and the link *g'* and for connecting said parts to the standard *f* and the support G are in alinement in order that the support G may be rigidly held from displacement during the entrance of the metal to be cast.

The described means for supplying the material to be cast to the mold and for holding the parts or sections of the mold in position with contiguous surfaces thereof slightly separated during the entrance of the material to be cast is particularly practical and efficient; but it will be obvious that any other means may be used for this purpose. It will also be obvious that any desirable means may be used for cutting off the surplus metal or sprue from the cast article and that such means may operate before the removal of the mold from connection with the discharge-nozzle.

My invention is not limited to any particular construction of mold, and consequently I have shown a number of different molds E E^{10} E^{20} E^{30} E^{40}, all of which are provided with parts or sections having contiguous surfaces thereof separated during the entrance of the metal to be cast. The parting lines of these molds may be at any suitable portion of the mold, and the molds may be of any desirable construction, two of the molds E^{30} E^{40} illustrated herein having corresponding parts or sections provided with projecting portions e^{40} e^{50}, entering the opposite parts or sections of the molds and loosely fitting sockets in said opposite parts or sections, so as to permit the escape of the air around said projecting portions.

In the use of my apparatus the support F is moved to its operative position, whereupon the link g^2 actuates the lever *g* and the link *g'* to move the support G into its operative position for holding the section *e'* of the mold E in position with contiguous surfaces of the sections *e e'* slightly separated. The metal is then forced into the mold E, and during its entrance the air readily escapes from the mold between the contiguous surfaces of the sections thereof, and owing to the minute separation of said surfaces of the sections *e e'* substantially no metal escapes between the sections. After the entrance of the metal within the mold the support F is rocked on its pivot to move the mold away from the discharge-nozzle, and during this movement of the support F the support G and the section *e'* are moved away from the section *e*, thus separating the sections of the mold for permitting the removal of the cast article.

The construction and operation of my apparatus for casting will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be obvious that said apparatus is not limited to any particular means for supplying the metal to the mold or for holding the sections of the mold in position with contiguous surfaces thereof separated.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a sectional mold; of means for holding contiguous surfaces of sections of the mold separated during the entrance of the material to be cast and thereby permitting the escape of air from the mold, substantially as and for the purpose described.

2. The combination with a sectional mold; of means for holding contiguous surfaces of sections of the mold separated during the entrance of the material to be cast and thereby permitting the escape of air from the mold, and for moving one of the sections of the mold away from the contiguous portion of the mold and thereby permitting withdrawal of the cast article, substantially as and for the purpose specified.

3. The combination with a sectional mold; of means for forcing the material to be cast under pressure into the mold, and means for holding contiguous surfaces of sections of the mold separated during the entrance of

the material to be cast and thereby permitting the escape of air from the mold, substantially as and for the purpose set forth.

4. The combination with a sectional mold; of means for forcing the material to be cast under pressure into the mold, and means for holding contiguous surfaces of sections of the mold separated during the entrance of the material to be cast and thereby permitting the escape of air from the mold, and for moving one of the sections of the mold away from the contiguous portion of the mold and thereby permitting withdrawal of the cast article, substantially as and for the purpose described.

5. As a new article of manufacture, the herein-described sectional mold having feet or projections for separating contiguous surfaces of sections thereof during the entrance of the material to be cast, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 12th day of September, 1901.

HERBERT H. FRANKLIN.

Witnesses:
S. DAVIS,
D. LAVINE.