

B. H. HOWARD & E. J. TURNER.
 INGOT MOLD AND FEEDER.
 APPLICATION FILED OCT. 2, 1915.

1,192,425.

Patented July 25, 1916.

Fig. 1.

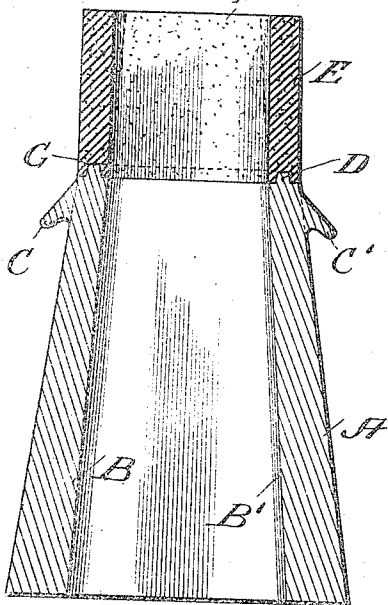


Fig. 2.

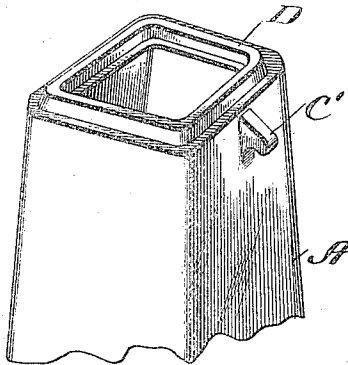


Fig. 5.

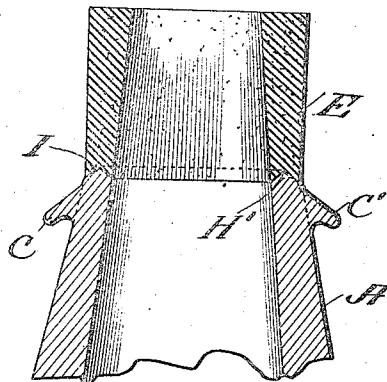


Fig. 3.

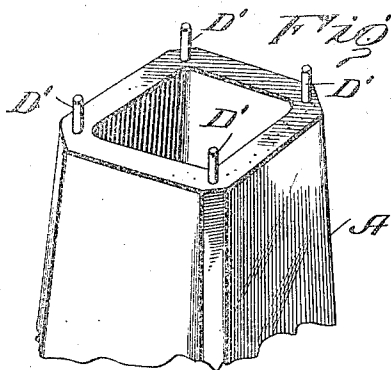


Fig. 4.

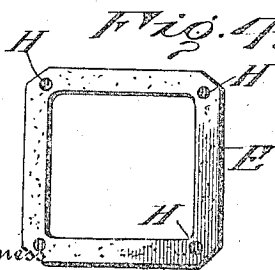
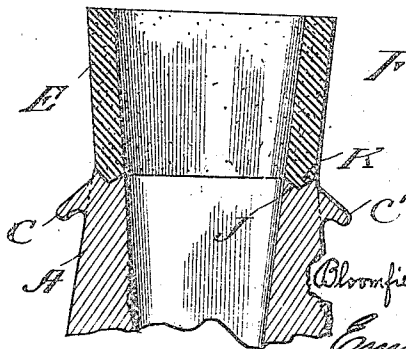


Fig. 6.



Witnessed

R. M. Howard

Inventor

Olsonfield H. Howard
Ernest J. Turner

UNITED STATES PATENT OFFICE.

BLOOMFIELD H. HOWARD, OF ASPINWALL, AND ERNEST J. TURNER, OF PITTSBURGH,
PENNSYLVANIA.

INGOT MOLD AND FEEDER.

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To all whom it may concern:

Be it known that we, BLOOMFIELD H. HOWARD and ERNEST J. TURNER, citizens of the United States, residing, respectively, at
5 Aspinwall and Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Ingot Molds and Feeders, of which the following is a specification.

10 Our invention relates to improvements in ingot molds and feeders.

The object of our invention is to provide a simple, practical and inexpensive means for the removal of seams, holes or cavities
15 in the upper portion of steel ingots known to the trade as "piping," also to practically eliminate segregation and produce iron and steel ingots homogeneous throughout in material as well as structure. This is accomplished by the use of any standard ingot
20 mold, although we prefer to use a slightly modified form of our own invention for which Letters Patent have been applied for. In this form the walls of the mold gradually
25 decrease in thickness from the bottom to the top, the mold being made preferably rectangular with rounded corners, together with a feeder made of fire-clay or other refractory material. The bore of the ingot
30 mold may be uniform, decrease in diameter from top to bottom or decrease in diameter from bottom to top, but preferably the last.

In the accompanying drawings in which like characters are used to designate like
35 parts, Figure 1 is a sectional view of an ingot mold and feeder of our preferred form. Fig. 2 is perspective view of the top of an ingot mold with an annular projection around the top. Fig. 3 is another perspective
40 view of the top of an ingot mold in which the annular projection is replaced by rod butts. Fig. 4 shows lower end of one form of feeder. Figs. 5 and 6 are vertical
45 sectional views showing modified forms embodying our invention.

Referring to Fig. 1, A represents an ingot mold with inner surfaces B, B'. On the sides of the mold A, are placed suitable lugs C, C', for moving the mold A, from place
50 to place and for stripping it from an ingot. At the top of the mold A, is a projection D,

which extends around the entire upper edge of the mold and is slightly wedge shaped as shown in Figs. 1 and 2.

E, is the feeder made of fire-clay or other
55 suitable refractory material and in form to suit the shape of any ingot mold whatsoever. We prefer it made with walls of uniform thickness and the passage F, to be of uniform diameter but it may be made with both
60 wall and passage modified to suit any conditions whatsoever, with the upper part of the body heavier than the lower and with the passage somewhat contracted at the top
65 as shown in Fig. 5 or in any other desired form. At the bottom of the feeder E, is an annular groove, G, made so as to fit over the annular projection.

In the form shown in Figs. 3 and 4 the
70 upper edge of the mold A is perfectly flat and is provided with a plurality of rod-butts D' which are adapted to enter holes or recesses H in the bottom edge of the feeder E and whereby the feeder is locked against
75 lateral movement on the mold.

In the modification shown in Fig. 5 the
upper edge of the mold A is V-shaped, as indicated at H' and the feeder E has a corresponding shaped groove I in its lower
80 edge. In Fig. 6 the same principle is employed only the mold A carries the groove J to receive the V-shaped lower end K of the feeder.

Having thus described our invention, the
85 practical workings are as follows: The feeder E is placed in position on top of the ingot mold A. Molten metal is poured into the ingot mold A, which immediately begins to freeze more rapidly along the inner surfaces
90 B, B' than in the center. As the metal rises to a higher level, this outer freezing becomes more pronounced until the feeder E, is reached which has been heated to a high degree by pouring the molten metal through
95 the opening F. The refractory material of the feeder E conserves the heat and not only prevents immediate freezing against its surfaces but keeps the metal in a molten state for quite a space of time during which the
100 metal will flow downward and fill any cavities formed by the contraction of the metal thus producing an ingot practically free

from "piping." Segregation is also reduced to a minimum.

Having thus described our invention what we claim is:

- 5 A metallic mold having its walls relatively thin at the top and increasing in thickness toward its lower end, and a feeder of refractory material resting upon the upper edge of the mold, and the feeder and
10 mold having interlocking members and the

inner walls of the feeder and mold being flush.

In testimony whereof we affix our signatures in presence of two witnesses.

BLOOMFIELD H. HOWARD.
ERNEST J. TURNER.

Witnesses:

T. D. ECKER,
R. M. HOWARD.