E. GATHMANN.

INGOT MOLD.

APPLICATION FILED FEB. 11, 1915.

1,258,209.

Patented Mar. 5, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

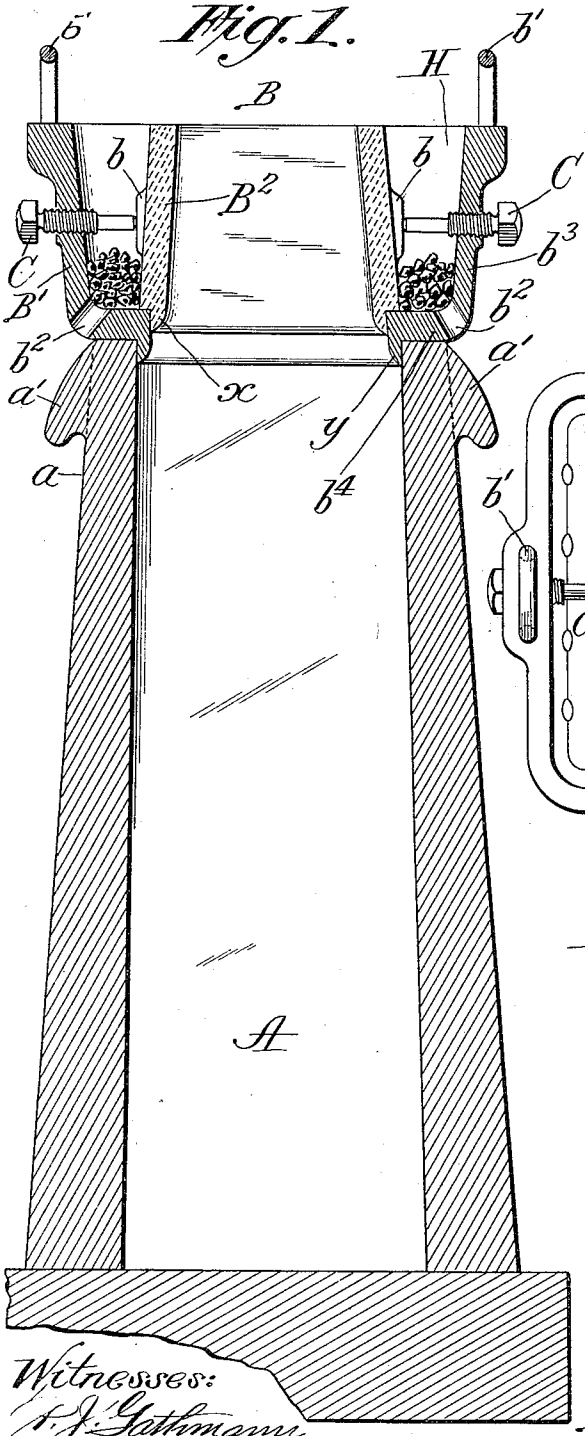


Fig. 2.

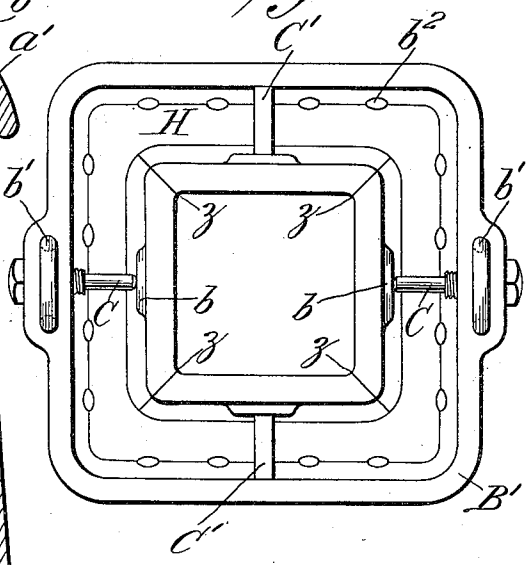
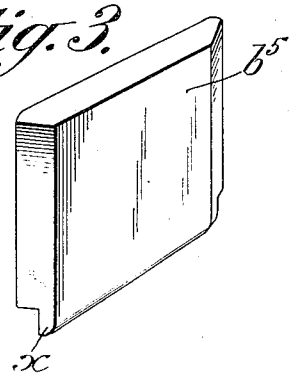


Fig. 3.



Witnesses:
F. J. Gathmann
M. E. Burrill

Inventor:
Emil Gathmann.
By his Attorneys:
Baldwin & Wright

E. GATHMANN.

INGOT MOLD.

APPLICATION FILED FEB. 11, 1915.

1,258,209.

Patented Mar. 5, 1918.

2 SHEETS—SHEET 2.

Fig. 4.

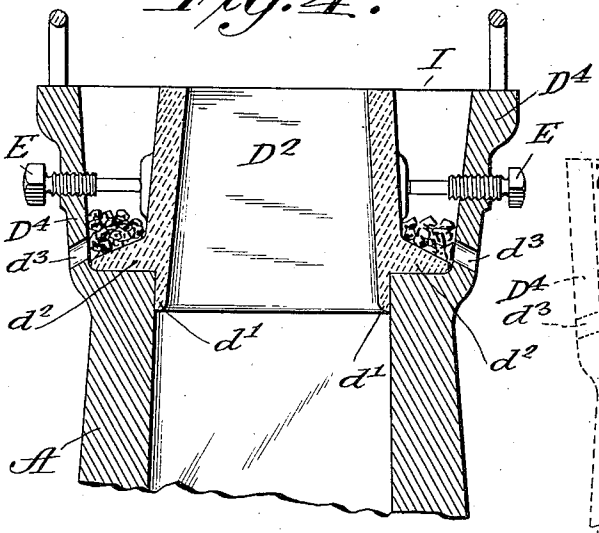


Fig. 6.

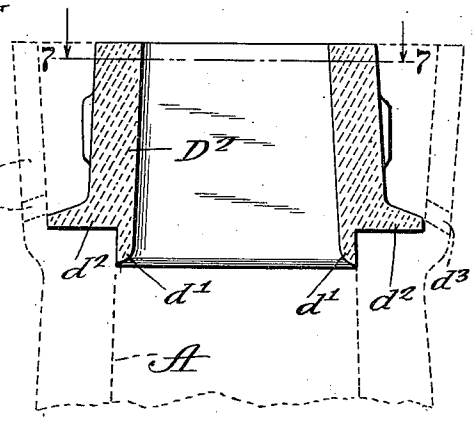


Fig. 5.

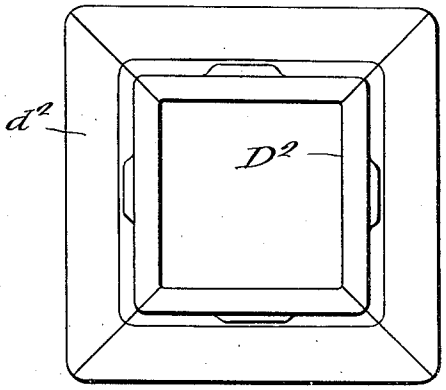


Fig. 7.

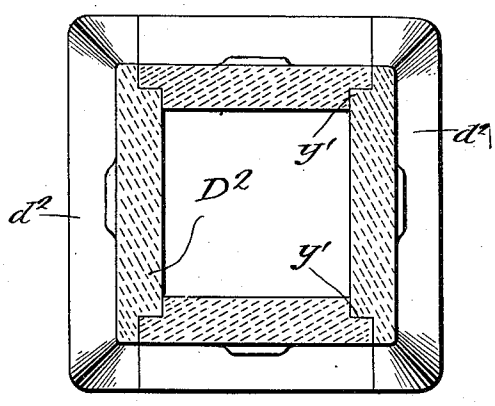


Fig. 8.

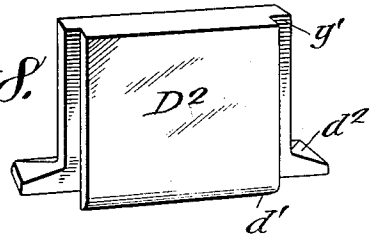
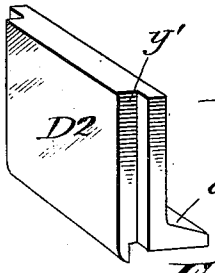


Fig. 9.



Witnesses:

A. J. Gathmann

M. E. Burrell

Inventor:

Emil Gathmann

By his Attorneys:

Baldwin & Wight

UNITED STATES PATENT OFFICE.

EMIL GATHMANN, OF BALTIMORE, MARYLAND.

INGOT-MOLD.

1,258,209. Specification of Letters Patent. Patented Mar. 5, 1918.

Application filed February 11, 1915. Serial No. 7,595.

To all whom it may concern:

Be it known that I, EMIL GATHMANN, a citizen of the United States, residing in the city of Baltimore and State of Maryland, have invented certain new and useful Improvements in Ingot-Molds, of which the following is a specification.

This invention relates particularly to molds for casting steel ingots and especially to the sink heads or feeders for such molds, but my improvements may be employed in connection with molds for forming other kinds of castings.

In several U. S. Letters Patent heretofore granted to me I have shown molds for casting steel ingots in which provision is made for conserving the heat of the molten metal at its upper portion and for promoting the cooling of the lower portion of the ingot or casting, and my improvements are especially intended for use in connection with such molds although they may be used in connection with molds of other designs.

U. S. Letters Patent have heretofore been granted to me for improvements in sink heads or feeders which have been found to be very useful and to assist materially in the formation of sound ingots, and the object of my present invention is to improve the construction of such sink heads or feeders, and to provide novel means for holding them in place.

According to my present invention I form the sink head or feeder of suitable refractory material such as fire brick and construct it in sections which may be readily molded and baked, and I provide novel means for holding these sections in place when applied to a mold.

My invention also involves means for preventing the formation of laterally projecting fins on the ingot which would tend to impede or prevent the stripping of the ingot from the mold.

In the accompanying drawings:—

Figure 1 shows a vertical central section through an ingot mold and feeder, embodying my improvements.

Fig. 2 is a plan view thereof.

Fig. 3 is a perspective view of one of the feeder sections.

Fig. 4 shows a vertical central section through the upper part of a mold and feeder embodying my improvements in a modified form.

Fig. 5 is a top view thereof.

Fig. 6 shows a vertical central section through the feeder illustrated in Fig. 4, and shows by dotted lines how it may be applied to the mold.

Fig. 7 shows a transverse section on the line 7—7 of Fig. 6.

Fig. 8 is a perspective view of one of the feeder sections, and

Fig. 9 is a perspective view of another one of these sections.

The mold A may be of any usual construction, either a big-end up or a big-end down mold or a mold having a cavity whose cross section is uniform. The drawings show a big-end down mold whose walls are made thicker in their lower portion in order to absorb heat more rapidly from the lower portion of the ingot than from the upper portion thereof, while the neck of the mold a has relatively thin walls and is therefore less absorptive, thus serving to conserve the heat of the ingot at its upper end. The mold may be formed with ears a' to facilitate in lifting it.

The feeder B comprises a feeder proper B^2, and a surrounding casing B'. The casing is preferably made of metal while the feeder proper is preferably made of fire brick or of other suitable refractory insulating material. The base b^4 of the casing is adapted to rest on the top of the mold A. Said base is formed with a downwardly projecting flange or bead y which prevents the molten metal from passing out laterally over the top of the mold and under the base of the casing. In this way the formation of a fin which would impede the stripping of the ingot from the mold is prevented. The side walls b^3 of the casing may be slightly flared, as shown, and air inlet openings b^2 are formed in the base of the casing for a purpose hereinafter described. The feeder proper, as before stated, is made in sections of refractory material. Preferably four such sections b^5 are employed having mitered joints z, as indicated. Each feeder section is also preferably formed with enlargements or bosses b to receive set screws C, extending through threaded openings in the casing B' and engaging said bosses. By adjusting the set screws the feeder sections may be pressed closely together at the joints. Instead of using set screws I may employ wedges C', as indicated in Fig. 2, for a simi-

lar purpose. It will be observed that the cavity of the feeder tapers from its lower end upwardly so that after the ingot is formed the feeder may be lifted and stripped from the ingot, and it will be further observed that there are no such shoulders in any part of the feeder as would prevent it from being stripped from the ingot. The exterior diameter of the feeder is considerably less than the interior diameter of the casing, thus forming a chamber H which may receive insulating material or fuel which may be ignited and fed with air through the openings b^2. In this way the radiation of heat from the upper portion of the ingot may be delayed, and therefore the molten metal is maintained in a fluid condition serving to fill the pipe forming the ingot and confining it to the extreme upper end of the ingot.

In Figs. 4 to 9, inclusive, I have shown some modifications of the invention. In this case the sink head or feeder is formed in sections D^2 having shouldered or zig-zag joints y' at the corners. Each said section is formed with an outwardly projecting flange d^2 providing a base portion which is adapted to rest on the top of the mold A, and this base portion is formed with a downwardly extending flange or bead d' projecting into the mold cavity and serving the same purpose as the flange or bead y shown in Fig. 1. The cavity of the feeder tapers upwardly for the purpose hereinbefore described. The casing D^4 in this case is made integrally with the mold A. It is provided with air inlet openings d^3 and it carries set screws E similar to those before described and which serve to hold the feeder sections in close contact with each other at the shouldered joints y'. There is a chamber I between the feeder and the casing D^4 which may contain insulating material or fuel, for the purpose before described. In other respects the mold and feeder are similar to those shown in Fig. 1 of the drawings. By these improvements the feeder may be economically made and may be readily and securely attached to the mold or supported thereon. The means employed for holding the feeder sections in place being adjustable good joints are assured. The formation of fins is prevented and the stripping of the ingot from the mold is facilitated.

I usually apply luting or fire clay or like material between the flange y and the adjacent mold wall and a similar luting may be applied between the flange x and the casing. Such luting is employed when any roughness is present at these joints.

It will be understood that a distinct advantage is gained by making the feeder in sections and joining them at the corners. The sections may be very readily molded and baked much more easily than if the feeder is made in one solid piece, and a better joint or union can be obtained at the corners than elsewhere. Furthermore, this construction permits of a more efficient centering of the feeder sections in the top of the mold. In use the feeder expands when highly heated and for this reason I have provided adjustable means for holding the feeder sections in close contact with each other and I preferably employ independently operated adjustable means for each section so that a close contact may be obtained at each joint.

I claim as my invention:

1. The combination with an ingot mold, of a feeder resting on the top of the mold and formed in four sections joined at the corners, each of said sections having a downwardly projecting flange or bead at the base extending into the mold, a metallic casing for said sections, and adjustable means for holding the feeder sections in close contact with each other.

2. The combination with an ingot mold of a feeder made in sections joined at the corners and provided with a downwardly projecting flange or bead at the base, a casing surrounding the feeder, and adjustable means interposed between the casing and the feeder for holding the feeder sections in position.

3. The combination with an ingot mold of a feeder therefor made in sections joined at the corners and removable from the mold, and adjustable means acting independently upon each section for holding said sections in contact with each other.

4. The combination with an ingot mold, of a feeder resting on the top of the mold formed in sections joined at the corners, each of said sections having a downwardly projecting flange or bead at the base extending into the mold and independently adjustable means operating upon each section for holding the feeder sections in close contact with each other at the joints.

5. The combination with an ingot mold of a feeder therefor, comprising sections of refractory material joined at the corners, a metallic casing for said sections resting on the top of the mold and removable therefrom, and adjustable means carried by the casing and acting independently upon each section for holding said sections in contact with each other.

6. The combination with an ingot mold of a feeder therefor, comprising a metallic casing resting on the top of the mold, and a plurality of sections of refractory material within the casing supported by the casing and removable therewith from the mold, each of said sections being continuous or in one unbroken piece from top to bottom.

7. The combination with an ingot mold of a feeder therefor, comprising a metallic cas-

ing resting on the top of the mold and a plurality of sections of refractory material within the casing supported by the casing and joined together at their vertical edges adjacent to the corners thereof and removable therewith from the mold, each of said sections being continuous or in one unbroken piece from top to bottom.

8. The combination with an ingot mold of a feeder therefor, comprising a metallic casing resting on the top of the mold and a plurality of sections of refractory material within the casing supported by the casing and bevel-jointed together at their vertical edges adjacent to the metallic casing corners and removable therewith from the mold, each of said sections being continuous or in one unbroken piece from top to bottom.

9. The combination with an ingot mold of a feeder therefor, comprising a metallic casing resting on the top of the mold, and sections of refractory non-conducting material within the casing supported thereby and removable therewith from the mold, each of said sections being continuous or in one unbroken piece from top to bottom.

In testimony whereof, I have hereunto subscribed my name.

EMIL GATHMANN.

Witnesses:
MAMIE MEWSHAW,
JOHN S. REID.