No. 636,885. Patented Nov. 14, 1899.

F. E. BACHMAN.

BLAST FURNACE CASTING APPARATUS.

(No Model.) (Application filed Apr. 14, 1899.) 2 Sheets—Sheet 1.

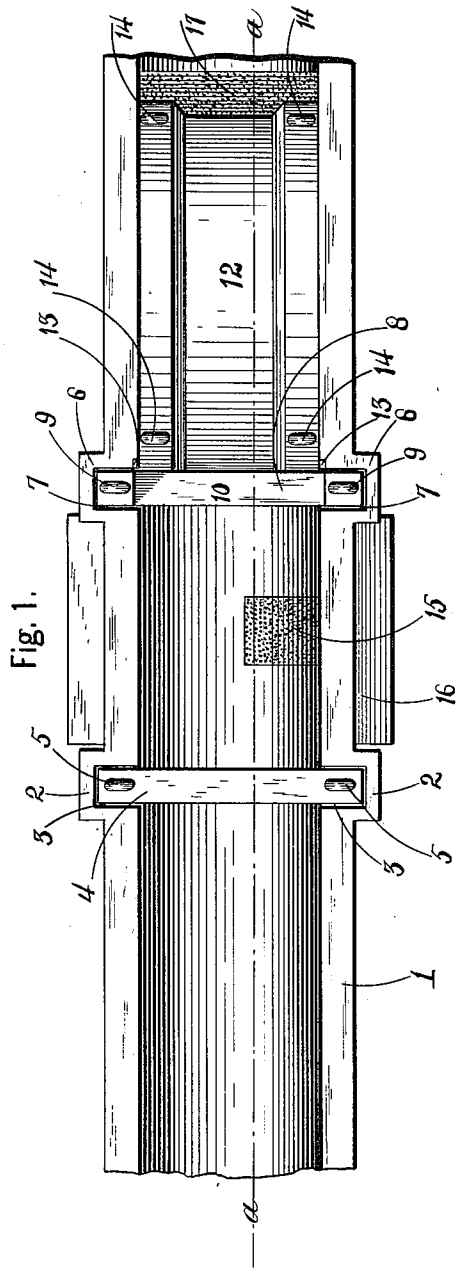


Fig. 1.

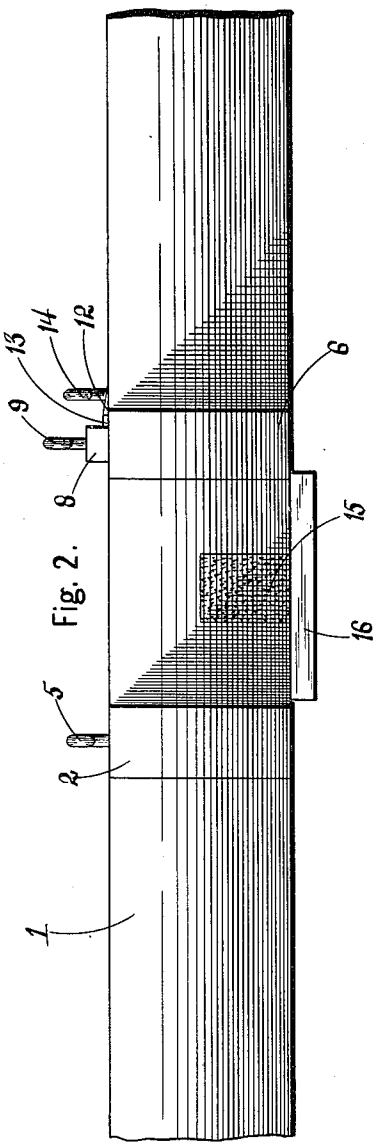


Fig. 2.

WITNESSES:

L. M. Billings.

G. A. Neubauer.

INVENTOR

Frank E. Bachman.

BY

A. J. Scangster.

ATTORNEY.

No. 636,885. Patented Nov. 14, 1899.

F. E. BACHMAN.

BLAST FURNACE CASTING APPARATUS.

(No Model.) (Application filed Apr. 14, 1899.) 2 Sheets—Sheet 2.

Fig. 3.

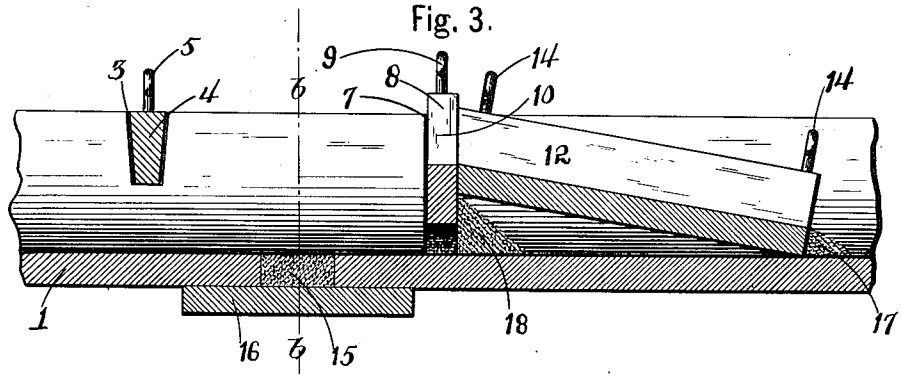


Fig. 4.

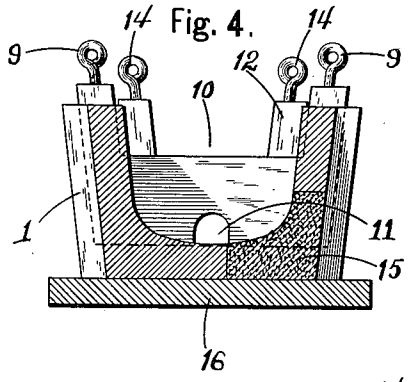


Fig. 5.

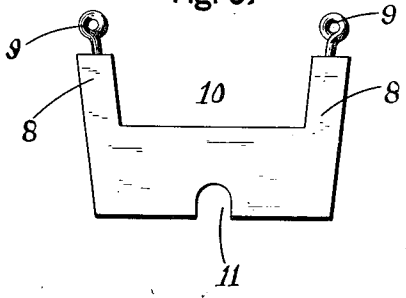


Fig. 6.

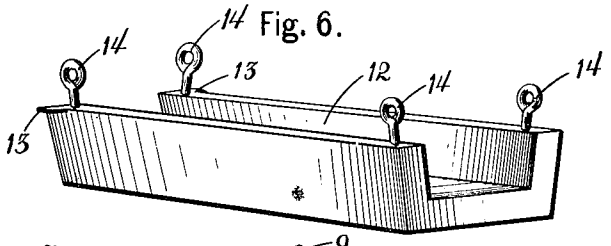
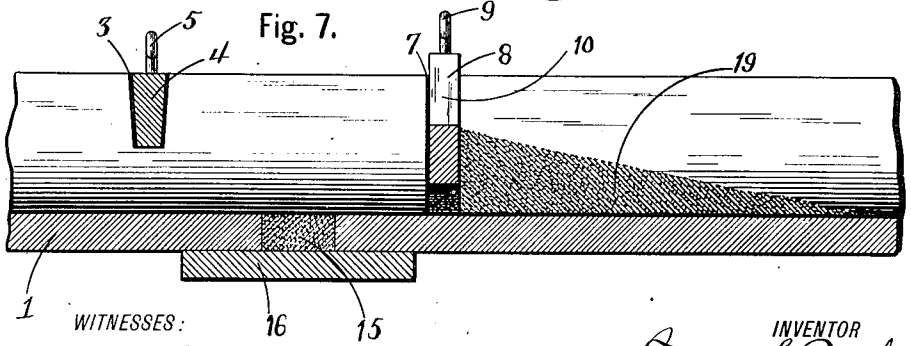


Fig. 7.



WITNESSES:

L. M. Billings.

G. A. Neubauer.

INVENTOR

Frank E. Bachman.

BY

A. J. Sangster.

ATTORNEY.

UNITED STATES PATENT OFFICE.

FRANK E. BACHMAN, OF BUFFALO, NEW YORK.

BLAST-FURNACE CASTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 636,885, dated November 14, 1899.

Application filed April 14, 1899. Serial No. 712,973. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. BACHMAN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Blast-Furnace Casting Apparatus, of which the following is a specification.

My invention relates to an apparatus for casting metal, and specifically to simplifying and improving the construction of the troughs utilized to convey the metal from the furnace to the molds. Heretofore the troughs employed for this purpose were provided with permanent or integrally-formed dams and necessarily a certain proportion of the metal of each cast was wasted, as no passage was provided for the metal remaining in the trough during the latter portion of the cast when reduced below the level of the dam. This invention is designed to afford means for saving and casting a larger percentage of metal than heretofore by providing the trough with a dam device that can be quickly and easily elevated or removed during the latter portion of the cast, and thereby provide a free passage for the metal remaining.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The invention is susceptible to various changes in the form, proportion, and minor details of construction within the scope of the claims without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 represents a plan view of a portion of a trough constructed in accordance with my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a longitudinal section on or about line *a a*, Fig. 1. Fig. 4 is a transverse section on or about line *b b*, Fig. 3. Fig. 5 is a detached view of the supplementary skimmer-gate. Fig. 6 is a perspective view of the supplementary trough. Fig. 7 represents a longitudinal section through a modified construction.

In referring to the drawings in detail like numerals designate like parts.

The trough 1, which is adapted to be utilized in connection with any ordinary and well-known furnace to convey the molten metal from the furnace to the molds, is formed of metal, preferably iron, and is provided with enlargements 2, having vertical recesses 3, which form slideways for a skimming-barrier 4. The skimming-barrier has eyebolts 5 or similar devices to afford means for handling the same to remove or replace it in the slideway during the casting. A second pair of enlargements 6, having similar slideways 7, is formed in the trough at a short distance from the first, and a removable dam 8 is supported in said slideways. This dam 8 is also provided with eyebolts or similar devices 9, a sufficient portion of the top being cut away, substantially as shown at 10 in Figs. 4 and 5, to permit the molten metal to flow over it. A similar opening 11 is also formed in the lower edge, the purpose of which will be explained farther on.

In my preferred construction a supplementary metallic trough 12 is arranged in the rear of the dam 8, and its upper end is preferably supported by the extensions 13, which catch upon the sides of the main trough. The trough 12 extends from the top of the dam 8 diagonally backward to the bottom of the main trough and serves to guide the molten metal back to the main trough in the rear of the dam as it flows over the dam. Eyebolts 14 or similar devices are attached to said trough 12 to facilitate the removal or replacement.

A portion of the bottom and one side of the main trough is cut away, substantially as shown in Figs. 1, 2, 3, 4, and 7, to form an opening 15 to afford means for the removal of slag, the opening being filled and walled up with sand during the flowing of the metal. A metallic plate 16 is placed beneath this opening, being interposed between the bottom of the main trough and the ground, which not only serves to support the sand, but also to protect it from moisture or water.

During the casting the crevices between the main trough, the skimming-barrier, dam, and supplementary trough and between the dam and the supplementary trough are preferably filled with clay or sand to prevent the entrance of the molten metal. A sufficient amount of

sand is banked in the rear of the dam 8, substantially as shown at 18 in Fig. 3, to prevent the passage of the molten metal beneath said dam, and the lower opening 11 in said dam is also preferably filled with sand. Sand is also preferably banked at the rear end of the trough 12 at 17. (See Figs. 1 and 3.)

In the modified form shown in Fig. 7 the supplementary trough is not used, and in lieu thereof a bank of sand 19 is arranged at the rear of the dam 8.

In casting with my improved trough the molten metal flows from the furnace under the skimming-barrier 4, then over the removable dam and supplementary trough, and thence to the molds. During the latter portion of the flow, when the metal stops running from the furnace and the level lowers sufficiently to prevent its passage over the dam 8, the banked sand behind the dam and the supplementary trough are removed to allow the remainder of the metal collected in front of the dam to flow through the opening 11 in the dam. Finally, when the remainder of the metal has run through said opening in the dam 8 the filling of sand in the opening 15 is tapped out and the slag is allowed to run from the trough through said opening 15.

I claim as my invention—

1. In a metal-casting apparatus, a metallic trough having a front skimming-barrier, a rear dam portion and a supplementary trough in the rear of the rear dam portion having extensions at the forward end resting on the side of the main trough.

2. In a metal-casting apparatus, a metallic trough having an opening in its bottom and side filled with sand, a removable skimming-barrier in front of said opening, a removable dam in the rear of said opening and a removable guiding means in the rear of the dam for guiding the molten metal to the bottom of the trough as it flows over the dam.

3. In a metal-casting apparatus, a metallic trough having an opening in its bottom and side filled with sand, a removable skimming-barrier in front of said opening, a removable dam in the rear of said opening having a top depression and a bottom opening, and a supplementary metallic trough supported in the main trough with its upper end level with the top depression in the dam and extending diagonally backward to the bottom of the main trough, as set forth.

4. In a metal-casting apparatus, a metallic trough having an opening in its bottom and side filled with sand, a metallic plate beneath said opening, a removable skimming-barrier in front of said opening, a removable dam in the rear of said opening and a removable guiding means in the rear of the dam for guiding the molten metal to the bottom of the trough as it flows over the dam.

5. In a metal-casting apparatus, a metallic trough having a skimming-barrier, a dam in the rear of said skimming-barrier having a bottom opening and a guiding device mounted in the rear of the dam for guiding the molten metal to the trough in the rear of the dam as it flows over the dam and arranged to be removed to provide a passage for the latter portion of the cast as it flows through the bottom opening in the dam.

6. In a metal-casting apparatus, a metallic trough having an opening in the bottom and side filled with sand, and a metallic supplementary plate beneath said opening, as set forth.

FRANK E. BACHMAN.

Witnesses:
L. M. BILLINGS,
G. A. NEUBAUER.