C. S. MORSE.

METHOD AND MEANS FOR BILLET CASTING.

APPLICATION FILED JULY 26, 1920.

1,387,293. Patented Aug. 9, 1921.

Fig. 1.

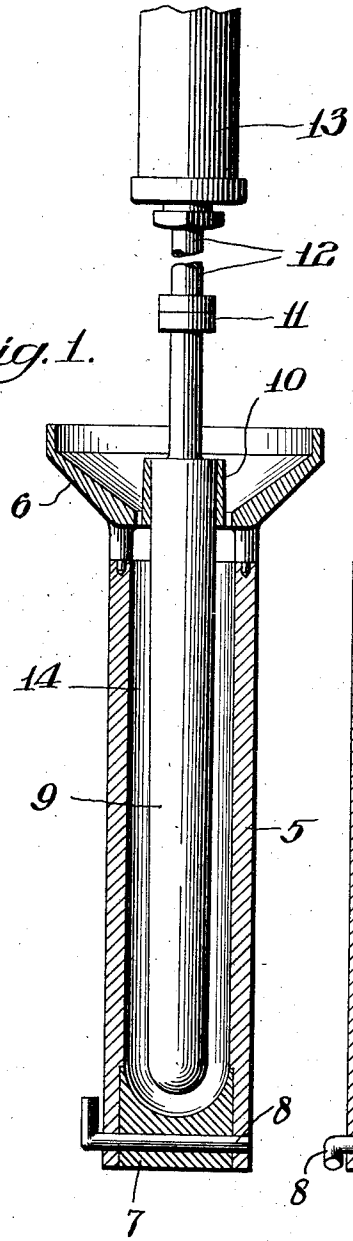


Fig. 2.

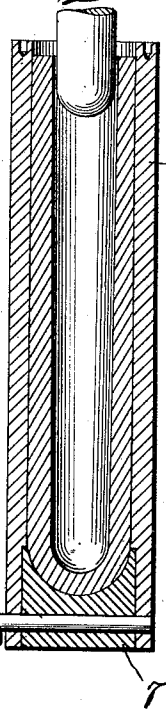
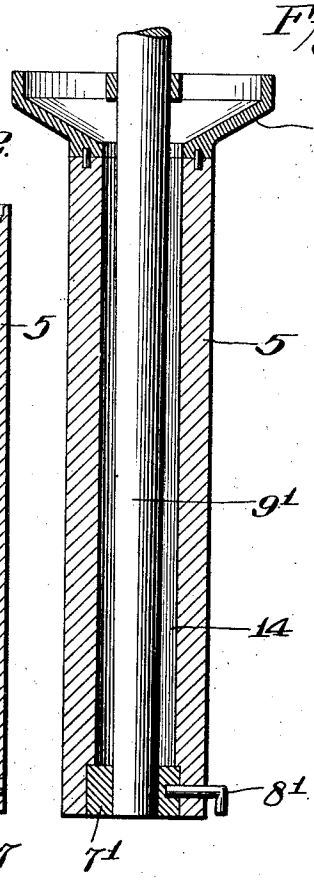


Fig. 3.



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UNITED STATES PATENT OFFICE.

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METHOD AND MEANS FOR BILLET-CASTING.

1,387,293. Specification of Letters Patent. Patented Aug. 9, 1921.

Application filed July 26, 1920. Serial No. 399,152.

To all whom it may concern:

Be it known that I, CHARLES S. MORSE, a citizen of the United States, residing at Roland Park, in the county of Baltimore, State of Maryland, have invented a new and useful Method and Means for Billet-Casting, of which the following is a specification.

My invention relates to billet casting. The object is to provide improved method and means for casting hollow billets.

The invention comprises improvements or modifications of the invention described in my copending application Serial No. 387,348 filed June 8, 1920.

The invention comprises a mold and a relatively movable tapered core for coöperating therewith. The core is adapted to have its smaller end at or near the bottom of the mold when in initial position for pouring. As the molten metal rises in the mold the core is usually withdrawn from the mold due to a relative movement between the core and the mold. The lower or smaller end of the core only passes the top of the mold after the completion of the pouring operation.

Referring to the drawings which illustrate merely by way of example suitable means for effecting my invention:—

Figure 1 is a view in longitudinal section showing the parts in position at the beginning of the casting operation.

Fig. 2 is a similar view of the mold, showing the lower end of the core, which is nearly withdrawn from the mold at or near the completion of the pouring operation.

Fig. 3 is a longitudinal section of a modification in construction.

Similar numerals refer to similar parts throughout the several views.

The mold element 5 is adapted to be supported by any suitable means not shown. This mold element is provided at the top with a removable pouring funnel 6 and at the bottom with a removable block or print 7, held in place by the bolt 8. The core 9 is shown as tapering downwardly and projecting to a point near the bottom of the mold, but spaced away from the surface of the print 7. The upper or larger end of the core 9 is guided and held in relatively central position, with respect to the mold 5 by the sleeve 10, forming part of the pouring funnel 6. This core 9 is adapted to be connected by the coupling 11 with the piston rod 12 of a piston or plunger, operating in the cylinder 13. Said piston or plunger being moved by a pressure medium introduced into the cylinder by any suitable means not shown.

In operation the metal is poured through the funnel 6 into the space 14, between the mold 5 and the core 9, and the core is withdrawn from the mold by the operation of the plunger in cylinder 13, at a speed determined by the shrinkage of the metal forming the casting, as described in my said copending application.

The molten metal when it comes in contact with the core will harden, as to its contact or inner surface, sufficiently to hold the body of the casting, after the core is withdrawn therefrom and until the body of the casting solidifies.

In Fig. 2, I show the core nearly withdrawn from the mold. This indicates the approximate relative position of the lower end of the core with respect to the level of the molten metal as the casting progresses. It will be understood that the entire casting is poured and completed to approximately the top of the mold, before the lower end of the core reaches the top of the mold.

It will be noted that by this method of proceeding the core is permitted to be entirely withdrawn from the mold very shortly after the completion of the pouring, so that the time or period required for casting is reduced to a minimum.

After the core has been entirely removed from the mold and the casting has become completely solidified, the pouring funnel 6 and the print 7 are removed from the mold, and the casting is ejected therefrom in the usual way.

By the arrangement shown in Fig. 1, in which the bottom of the core is spaced from the upper or partially surrounding surface of the print, the casting formed is closed at its lower end; this form of casting being desirable for cupping purposes.

In the modification shown in Fig. 3, the core 9′ projects into or through the block or print 7′ so that the casting formed between the core and mold is open at both ends.

What I claim is:—

1. The method of casting hollow billets which consists in introducing the molten metal into the space formed between a mold element and a core, the core tapering downwardly toward the bottom of the mold ele-

ment, and causing relative continuous movement between the mold element and the core to cause the withdrawal of the core from the mold, during the pouring operation said movement being timed so that the lower end of the core shall be maintained below the level of the molten metal until the pouring has been completed.

2. The combination of a mold element and coöperating core tapering downwardly toward the bottom of the mold element, and means for causing continuous relative movement between the mold element and the core to cause the withdrawal of the core from the mold, during the pouring operation and so that the lower end of the core shall be maintained below the level of the molten metal until the pouring has been completed.

3. The combination of a mold element, a coöperating core tapering downwardly toward the bottom of the mold element, means for supporting the core so that its lower end in initial position shall be spaced from the bottom of the mold element, and means for causing continuous relative movement between the mold element and the core so that the core shall be withdrawn from the mold element relatively to the pouring operation.

4. The combination of a mold element and coöperating core tapering downwardly toward the bottom of the mold element, and means for causing continuous relative movement between the mold element and the core so that the core shall be withdrawn from the mold element during the process of pouring but shall not entirely leave the mold element until the completion of the pouring operation.

CHARLES S. MORSE.