(No Model.)

C. C. CURRIER.

PROCESS OF CASTING INGOTS.

No. 385,749. Patented July 10, 1888.

Fig. 1

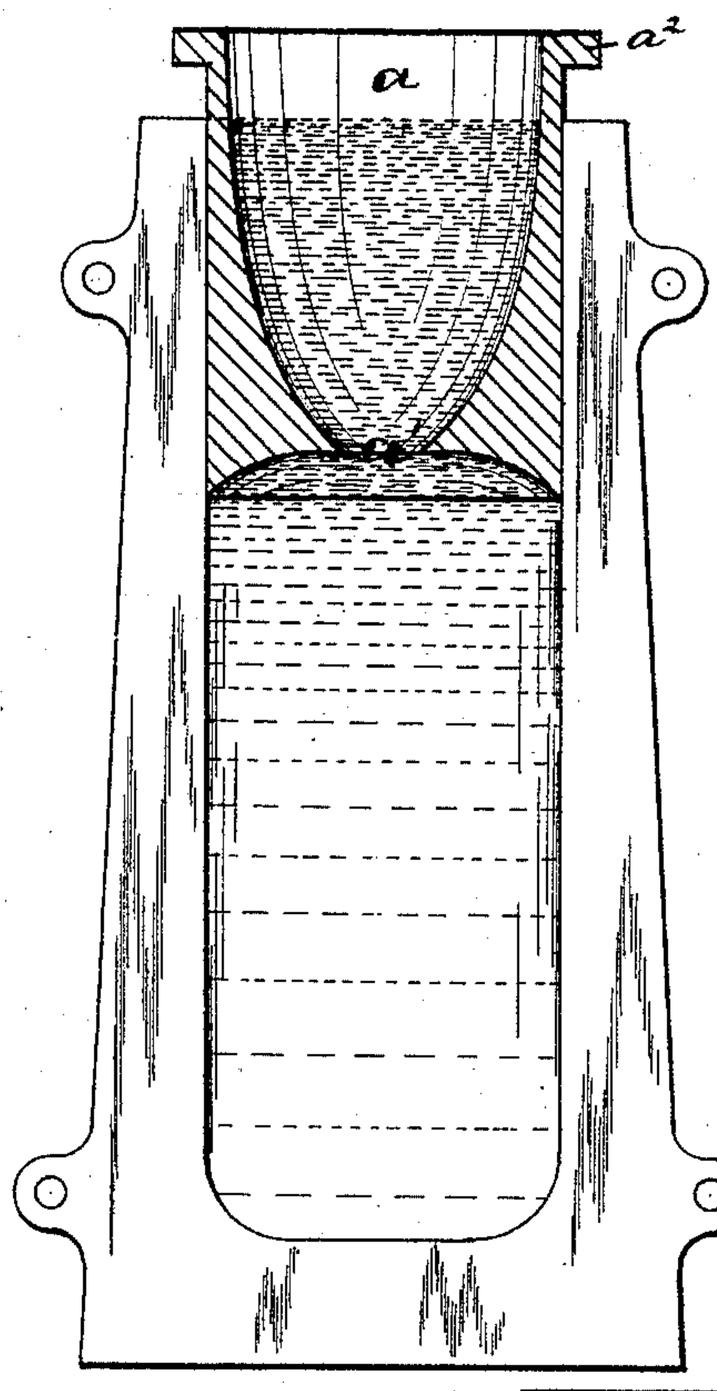


Fig. 2

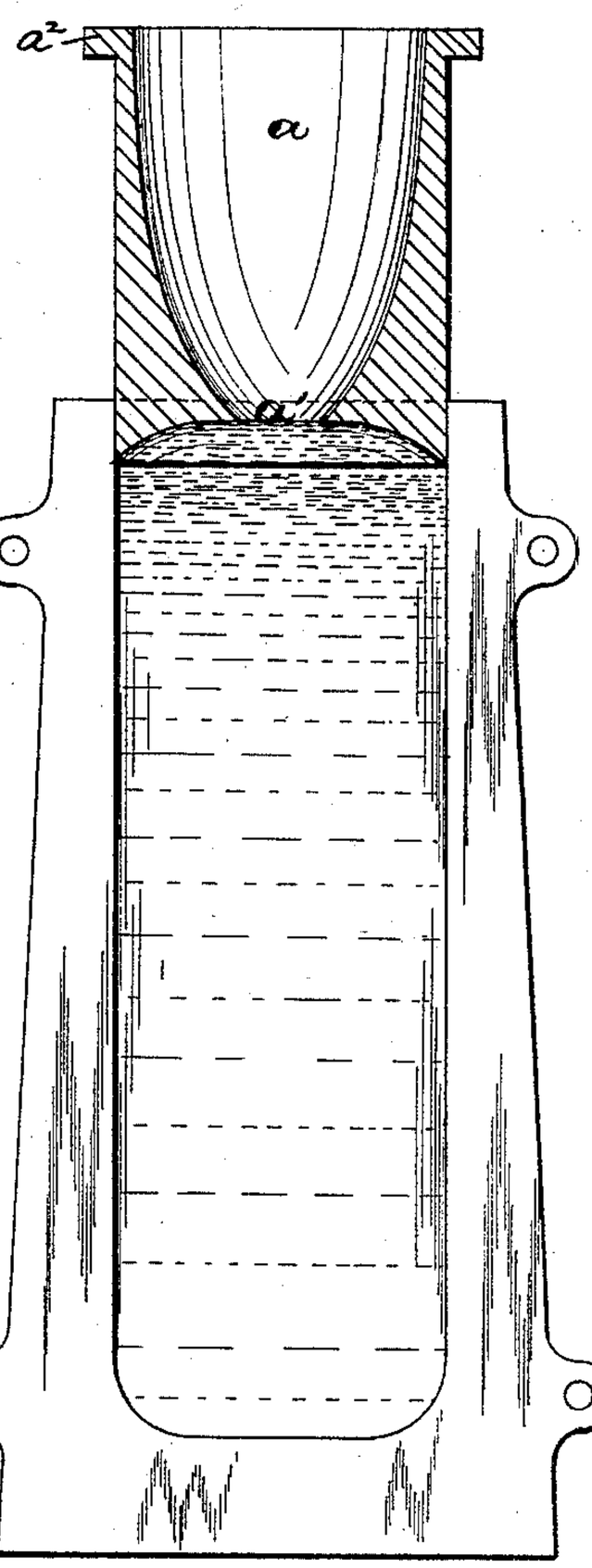
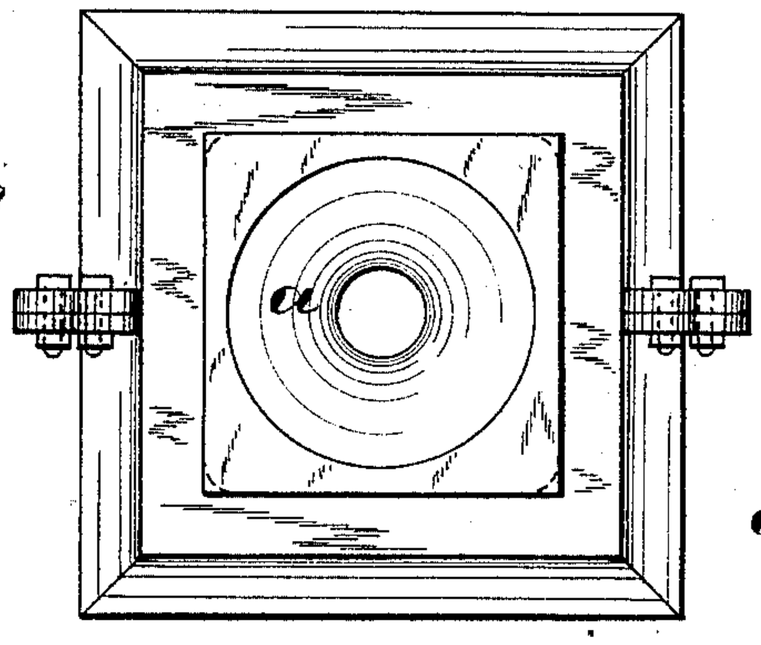


Fig. 3



WITNESSES:

Wm. Scarlett
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UNITED STATES PATENT OFFICE.

CYRUS C. CURRIER, OF NEWARK, NEW JERSEY.

PROCESS OF CASTING INGOTS.

SPECIFICATION forming part of Letters Patent No. 385,749, dated July 10, 1888.

Application filed January 14, 1888. Serial No. 260,717. (No model.)

To all whom it may concern:

Be it known that I, CYRUS C. CURRIER, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Processes of Casting Ingots; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

In the drawings herewith accompanying is illustrated a feeder for ingot-molds which forms the subject of another application contemporary herewith, which is designed to prevent the formation of the pipe in casting ingots of steel, said application being made by Sidney H. Boucher, and numbered 260,490.

In casting steel ingots it is the custom among steel-makers to pack the crucibles with enough of the mixture to produce the quantity of molten metal which the mold is adapted to hold. In using the improved feeder above referred to, unless the space occupied by said feeder when inserted into the mold is taken into consideration, there is frequently left over in the crucible a quantity of metal which is wasted, as the mold is not capable of receiving it. This occurs when the said feeder is fixed and immovable within the mouth of the mold. To obviate this difficulty I have devised a method of casting the ingot whereby the mold is capable of receiving all of the metal in the crucible or ladle without any waste.

The figures in the drawings illustrate the relation of the feeder to the mold during the steps of my process.

Figure 1 represents a half-section of a mold and the feeder inserted therein, and in that position which it assumes in the early part of the operation of casting. Fig. 2 is a view similar to Fig. 1, showing the position of the feeder and its relation to the mold in the closing stage or end of the operation of casting as I execute it; and Fig. 3 is a plan view of the mold with the inserted feeder.

Similar letters of reference indicate corresponding parts in each of said views.

In carrying out my process the feeder is arranged loosely within the mouth of the mold, so that it is free to be lifted by the molten steel as it rises within the mold. The feeder, having been previously heated, is inserted within the mouth of the mold, and is prevented from slipping within the mold by means of shoulders a^2, formed on the outside of said feeder. The molten metal is then poured into the reservoir a, and flows through the opening a' in the bottom of said reservoir into the mold, and as the pouring continues the metal rises within the mold and strikes the under side or bottom of the feeder and lifts the same up toward the mouth of the mold. The effect of this operation is, by the lifting of the said feeder, to increase the capacity of the mold to an extent nearly equal to the capacity of the reservoir in the feeder, so that while the feeder is being lifted within the mold the metal in the reservoir flows into the mold, and thus makes room for the molten metal remaining in the crucible.

During the elevation of the feeder the shrinkage or contraction of the metal within the mold takes place, so that when the feeder has reached its highest point there still remains in the feeder a sufficient quantity of metal, which flows into the mold and fills up the pipe, which results from the contraction and settling of the metal. In Fig. 2 is represented the position which the feeder assumes at the end of the casting operation, when all of the metal in the crucible has been poured into the feeder and has flowed therefrom into the mold.

By means of the process of casting which I have thus described provision is made for any variation that may occur in the quantity of the mixture that may be contained in the crucible.

Should the feeder rise too rapidly within the mold before the shrinkage occurs to any extent, the upward movement of the feeder may be retarded or brought to a full stop simply by resting the crucible upon the top of said feeder while pouring the steel from the crucible into the reservoir.

The word "floating," as applied to the feeder used in my improved process, is intended to designate a feeder which is loosely arranged within the mouth or top of the mold, so that it

floats and rests upon the top of the liquid metal within the mold, and as said metal rises it lifts the feeder with it within the mold.

Having thus described my invention, what I claim is—

1. The process of casting steel ingots, which consists in arranging a heated feeder loosely in the mouth of a mold, pouring melted steel into and through said feeder into the mold, and continuing the pouring until the steel lifts the said feeder to a point which is determined by the quantity of metal in the crucible or ladle.

2. The process of casting steel ingots, which consists in pouring melted steel into and through a floating feeder into an ingot-mold.

3. The process of casting ingots, which consists in pouring molten metal through a floating feeder into an ingot-mold, continuing the pouring of said metal into and through said feeder until the same is caused to rise within the ingot-mold, retarding or stopping the upward movement of said feeder when the quantity of metal remaining in the reservoir of said feeder and the crucible is sufficient to fill up the spaces made by the shrinkage of the metal within the ingot-mold.

In testimony that I claim the invention set forth above I have hereunto set my hand this 12th day of January, 1888.

CYRUS C. CURRIER.

Witnesses:
FREDK. F. CAMPBELL,
FREDK. C. FRAENTZEL.