No. 666,373. Patented Jan. 22, 1901.

D. BAKER.

SKIMMING TROUGH.

(Application filed Sept. 25, 1900.)

(No Model.)

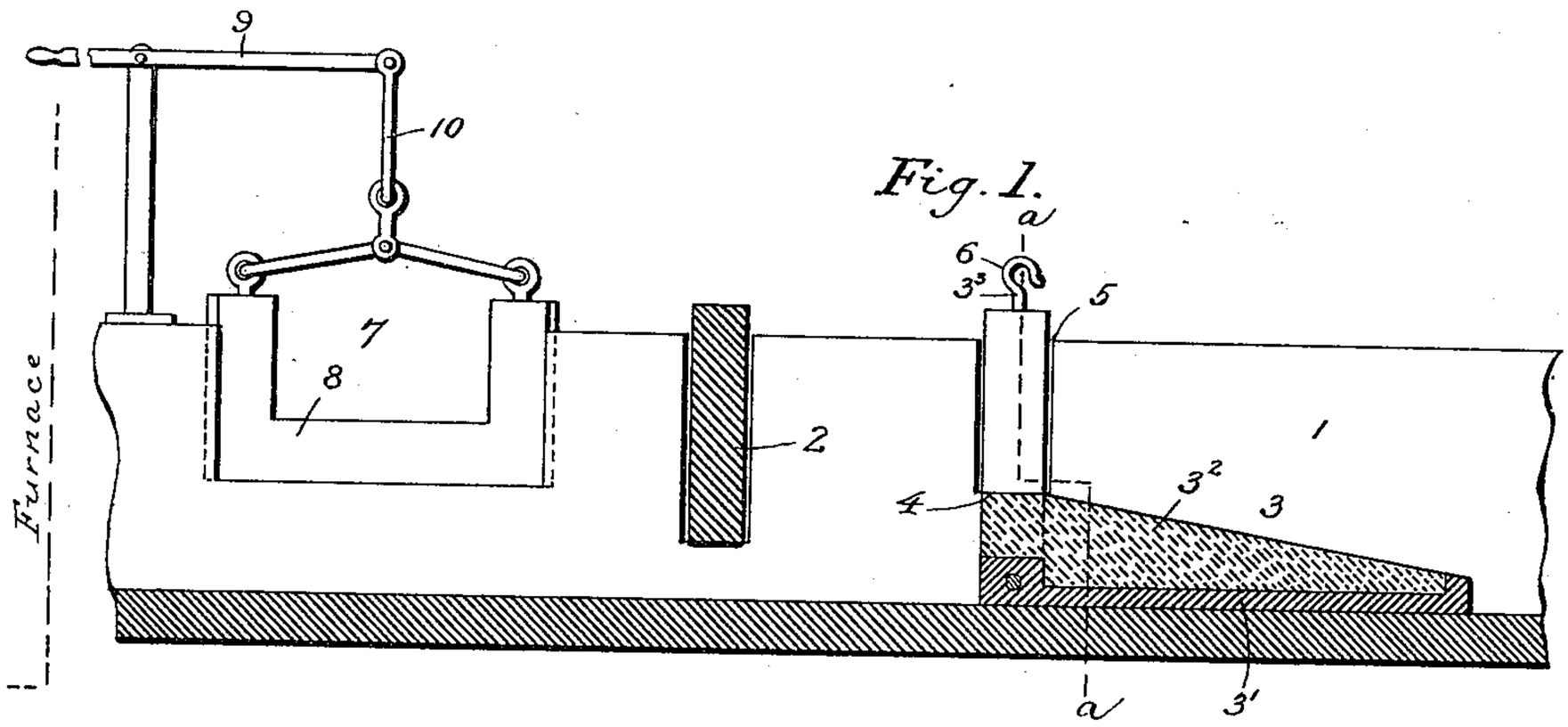

Fig. 1.

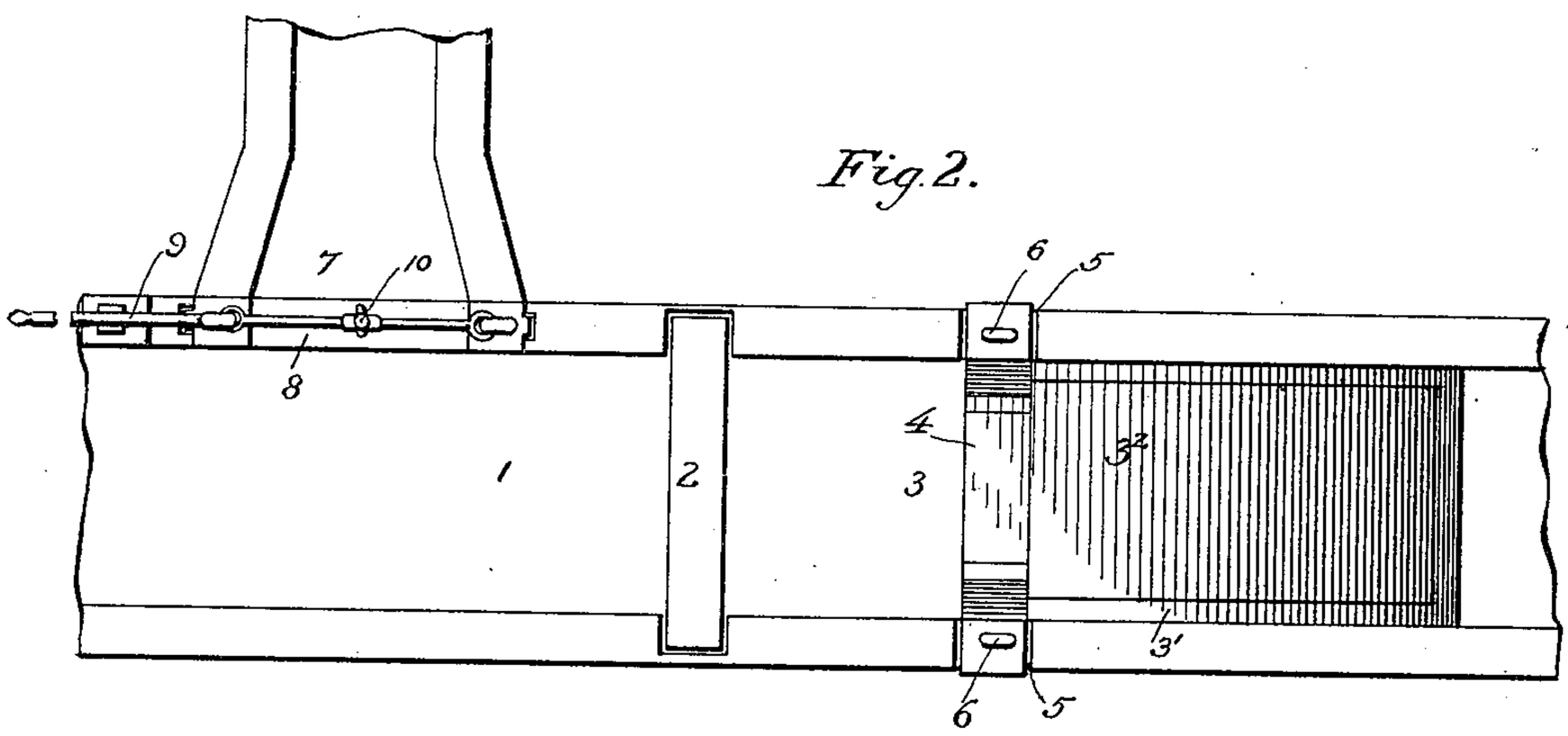

Fig. 2.

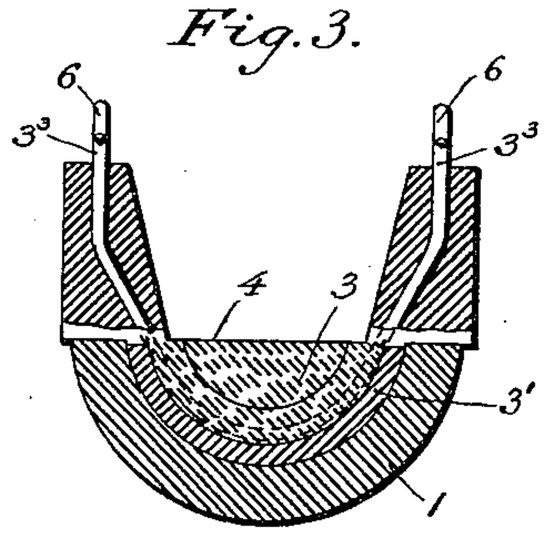

Fig. 3.

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DAVID BAKER, OF CHICAGO, ILLINOIS.

SKIMMING-TROUGH.

SPECIFICATION forming part of Letters Patent No. 666,373, dated January 22, 1901.

Application filed September 25, 1900. Serial No. 31,039. (No model.)

To all whom it may concern:

Be it known that I, DAVID BAKER, of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Skimming-Troughs, of which the following is a specification.

This invention relates to the casting of metal, and has reference more particularly to the trough usually employed to convey the molten metal from the furnace to the ladle or molds. Troughs for this purpose are now constructed in various ways to skim the slag from the surface of the metal, usually by means of a fixed barrier under which the metal flows and by which the slag is separated. As far as I am aware, however, there has been with these devices either a waste of the metal at the end of the casting operation, an imperfect separation, or an imperfect discharge of the metal from the trough. My invention is designed to overcome these objections, and it consists mainly of a slag-discharging opening situated in front of the usual barrier and so formed that the level of its discharge-surface may be changed, so as to act with equal effectiveness both when the metal is at its highest level in the trough and when the level of the metal is lowered, as toward the end of the casting operation, and this to the end that a thorough separation of the slag may be effected and all the metal utilized.

The invention also consists in combining with this slag-discharging opening a discharging-dam for the skimmed metal, situated in rear of the barrier and so formed that it may be operated at the proper time to permit the entire contents of the trough to be quickly discharged.

The invention consists also in the details of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation through my improved trough. Fig. 2 is a top plan view of the same. Fig. 3 is a transverse section on the line *a a* of the preceding figures.

Referring to the drawings, 1 represents a trough comprising two side walls and a bottom joining them and serving to convey the molten metal from the furnace (indicated by dotted lines, Fig. 1) rearward to the ladles or molds. At a suitable point in its length the trough is provided with the usual skimmer or barrier 2, suitably set in the side walls, with its lower edge terminating some distance above the bottom of the trough to leave a passage for the flow of the molten metal beneath it, the level of the latter being maintained above the lower edge of the barrier by a dam 3, situated in rear of the barrier and serving to seal the same and prevent the passage of slag beneath it.

The dam 3 extends transversely across the trough and is formed to fit within the bottom of the same to close its lower portion, the upper edge 4 of the dam extending at a higher level than the lower edge of the barrier in order to act as a seal for the same. The sides of the dam are extended upward and fit slidingly in guiding-openings 5 in the side walls of the trough in order that it may be raised bodily to quickly discharge the contents of the trough, as will be hereinafter more fully described, suitable lifting devices, such as hooks 6, being provided for elevating it.

For the purpose of discharging the slag during the flow of the metal through the trough I provide in one wall of the trough in front of the barrier a slag-discharging opening 7, the bottom of which opening is above the bottom of the trough and on or about the level of the dam 3. In this opening is mounted a vertically-movable slag-dam 8, resting when in its normal position on the bottom of the opening, with its upper edge at a level somewhat above that of the dam 3, so as to drain off the slag from the metal flowing through the trough at the first part of the casting operation, at which time it is higher in front of the barrier than toward the end of the casting operation, when the tap-hole of the furnace is closed. It is seen, therefore, that the dam 8 when in its normal position constitutes the discharging-surface of the slag-opening, which discharging-surface may be lowered by raising the dam, the slag then flowing over the bottom of the opening. This dam may be provided with suitable means for raising and lowering it—such, for instance, as a horizontal lever 9, connected by a vertical link 10 with the dam.

In the operation of casting the slag-dam occupies its normal lowered position, resting on the bottom of the opening, as shown in

full lines in Fig. 1, the dam 3 in rear of the barrier being adjusted in place to close the lower part of the trough. When the tap-hole of the furnace is open at the first part of the casting operation and the metal rapidly flowing through the trough, it is backed up in front of the barrier at a level above the top of the dam 8, and the slag flows over the edge of this dam through the side of the trough. Toward the end of the casting operation, when the flow of metal decreases and the tap-hole of the furnace is closed, the level of the metal in front of the barrier lowers, and to permit the slag to pass off when the metal is thus lowered slag-dam 8 is elevated and the slag escapes beneath it over the edge of the opening 7. When all the slag has thus run off, the dam 3 in rear of the barrier is raised and the remaining metal, free from slag, escapes rapidly through the trough. It is seen, therefore, that there is a thorough separation of the slag from the metal and every portion of the latter saved, the rapid discharge of the remaining metal at the end of the casting operation serving to leave the trough in such a condition that it may be cleaned without trouble and prepared for the next operation.

I propose to form the dam 3 of cast metal, with a rearward extension or shell $3'$, adapted to rest on the bottom of the trough, with its side edges sloping downward from the upper edge of the dam to the end of the extension. This shell is filled with refractory material 3^2, such as clay or loam, with its upper face sloping downward, as represented in Fig. 1. This construction forms a light durable dam which may be easily raised at the proper time. The lifting devices 6 are in the form of hooks formed on the ends of a rod 3^3, which extends through the cast body of the dam, being incorparated therein during the casting of the body.

Having thus described my invention, what I claim is—

1. The combination with a skimming-trough provided with a slag-discharging opening, having its level normally below the top edge of the trough, of means for lowering the level of said opening to a point above the bottom of the trough, a barrier situated in said trough between the opening and the discharge end of the trough, and means for sealing said barrier.

2. The combination with a skimming-trough provided at its side with a slag-discharging opening, of a dam situated in said opening and constituting a temporary bottom for the same, over which the slag may flow and movable vertically, a skimming-barrier situated in said trough between the dam and the discharge end of the trough, and means for sealing the barrier.

3. The combination with a skimming-trough provided with a slag-discharging opening, of means for changing the level of said opening and constituting a temporary bottom for the same, over which the slag may flow, a movable dam between the slag-opening and discharge end of the trough, and a barrier between the movable dam and the slag-opening, said dam being formed to normally wholly close the lower part of the trough.

4. The combination with a skimming-trough provided in its side with a slag-discharging opening with its bottom at a higher level than the bottom of the trough, of a movable dam resting on the bottom of the opening, a barrier between the movable dam and the discharge end of the trough, and means for sealing the barrier.

5. The combination with a skimming-trough, of a barrier situated therein, with its lower edge terminating above the bottom of the trough, a dam between the barrier and the discharge end of the trough with its upper edge above the lower edge of the barrier, said trough being formed in its side between the barrier and the entrance end of the trough with a slag-opening, and means for changing the level of said opening from a point above the level of the dam to a point at or about its level.

6. In a skimming-trough a dam adapted to be raised to clean the trough, said dam comprising a cast-metal body having a filling of refractory material, adapted when the dam is in place to be exposed to the flow of the metal passing through the trough.

7. In a skimming-trough a dam composed of a metal body having an extension or shell adapted to rest on the bottom of the trough and filled with refractory material.

In testimony whereof I hereunto set my hand, this 14th day of August, 1900, in the presence of two attesting witnesses.

DAVID BAKER.

Witnesses:
P. M. CALDWELL,
HOLLIS A. FOX.