(No Model.)

2 Sheets—Sheet 1.

J. HARRISON.

MOLD.

No. 277,131. Patented May 8, 1883.

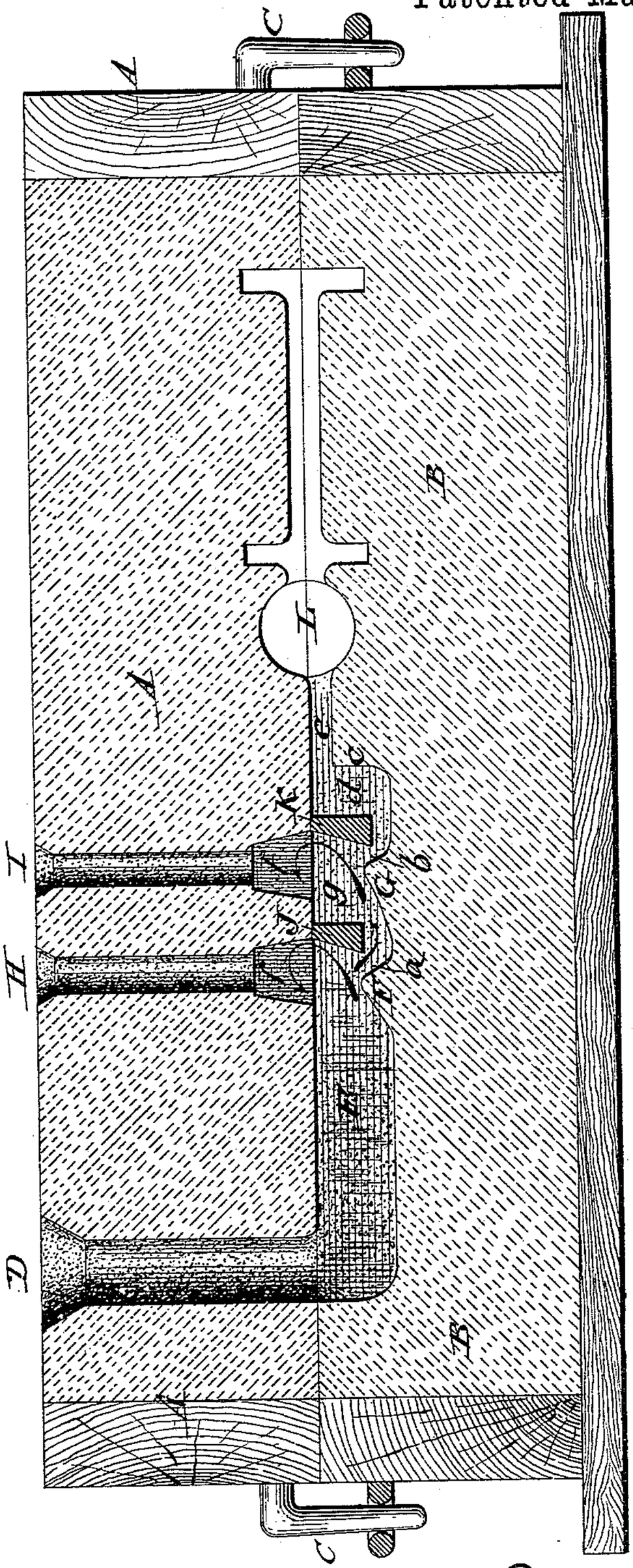

Fig. 1.

Attest.

Sidney P. Hollingsworth

Walter S. Dodge

Inventor:

Joseph Harrison,

by Dodger Son,

attys

(No Model.) 2 Sheets—Sheet 2.

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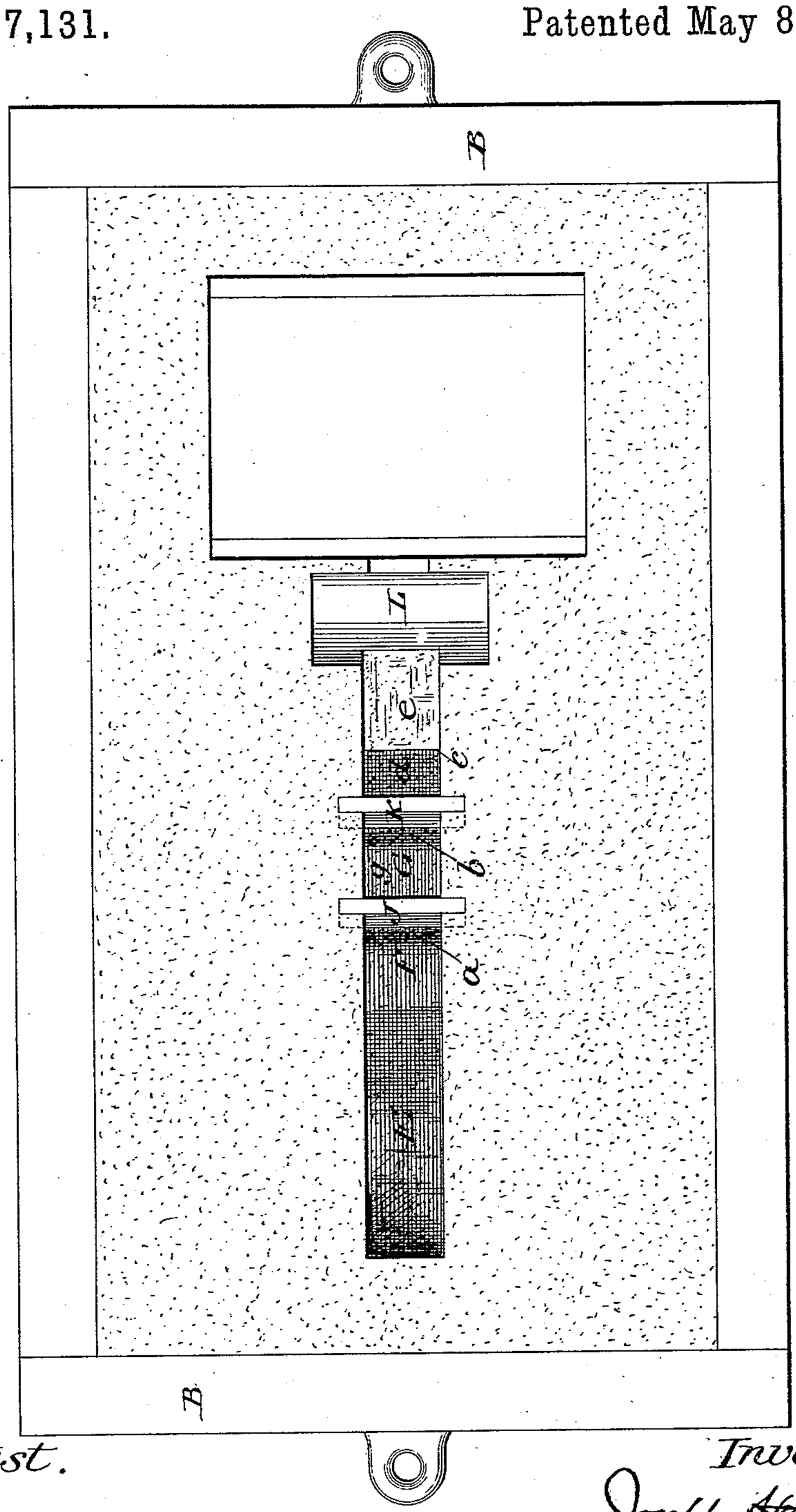

Fig. 2.

Attest.

Sidney P. Hollingsworth
Walter S. Dodge.

Inventor.

Joseph Harrison,
by Dodge & Son,
Attys.

UNITED STATES PATENT OFFICE.

JOSEPH HARRISON, OF MILWAUKEE, WISCONSIN.

MOLD.

SPECIFICATION forming part of Letters Patent No. 277,131, dated May 8, 1883.

Application filed March 31, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HARRISON, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain Improvements in Molds, of which the following is a specification.

My invention relates to sand molds for casting metal; and it consists in a novel arrangement of skimming gates and passages, whereby the scoria and impurities are removed and the air bubbles or cells permitted to escape before entering the mold proper.

In the accompanying drawings, Figure 1 represents a longitudinal section through a mold embodying my improvements; Fig. 2, a plan view of the lower half or drag.

A represents the cope, B the drag, and C the steady-pins, all arranged in the usual manner.

D indicates the sprue or ingate, which opens into a horizontal chamber or passage, E, at its lower end, the bottom of which passage is formed with two inclines, F and G, each extending transversely across the passage E from side to side thereof, as shown in Fig. 2. For convenience of explanation I shall designate the side or end of the mold at which the sprue is located as the "front" of the mold.

H and I represent two vertical chambers or openings, extending from passage E to the top of the cope, one directly over the crest of each of the inclines F G, the purpose of which openings is to afford room or outlet for the scoria and impurities removed from the molten metal poured into the mold.

At the rear side of the opening or chamber H is arranged a core or gate, J, and at the rear side of opening or chamber I is arranged a similar gate or core, K, said cores extending downward from the upper side of chamber or passage E, each to a point below the crests of the inclines F G, and gate K being somewhat lower down than gate J.

The lower end of each of the vertical openings or chambers H I is of rectangular form and of increasing size toward the bottom, and the front upper edge of each gate or core is placed on line with the rear side thereof, the front face of the gate thus forming a continuation of the rear wall of such rectangular portion, as seen in Fig. 1. The front side or face of each gate is inclined backward from the lower edge to the top, and forms an obtuse angle with the rear wall of the vertical chamber, and the gate K is placed in closer proximity to the incline G than is the gate I to incline F, by which latter arrangement the passage *b* is made narrower than passage *a*. In rear of the gate K the passage or chamber E is terminated by a vertical wall, *c*, between which and the gate is a vertical chamber, *d*, communicating with mold proper, L, by a narrow horizontal passage, *e*, at the top of said chamber. It is found convenient to form the chamber or passage E and to place the gates J K wholly within the drag B, the lower side of the cope forming the top or roof of said chamber; but I do not limit myself to such arrangement nor to the precise form of the gates or chambers. Slight modifications may be made in each without departing from the principle of my invention.

The mold being thus constructed, the operation is as follows: Molten metal being poured into sprue D flows along the bottom of chamber or passage E, and, flowing up incline F, is carried by its inertia or impetus across the passage *a*, and strikes against the inclined face of gate J, which causes the metal to be directed upward to the reversely-inclined rear wall, *f*, of chamber or opening H, whereby it is thrown over and falls in rear of the crest of incline F. As the scoria and impurities float on the top of the metal, it will be seen that they will be thrown again in front of passage *a*, while the heavier pure metal will flow through said passage into chamber *g* between the two gates, passing up incline G, striking against gate K, and repeating the action described as taking place in striking gate J, the purer and heavier metal flowing through opening *b* into vertical chamber *d*, and thence through horizontal passage *e* into the mold proper, L, the contraction of opening *b* causing the flow into the mold to be gradual and regular, and thus avoiding the washing or injury of the mold likely to occur where the metal flows directly and with force into the mold. The direction given to the metal by the inclines, the beveled or inclined fronts of the gates, and the inclined

walls of the chambers H and I causes the metal to roll, whirl, or turn over, and the air cells or bubbles are thus brought to the surface and allowed to escape. The scoria and impurities rise in the vertical chambers H I, and, being lighter than the pure metal, have no tendency to again enter into the same, but float on the top thereof. This peculiar construction and arrangement produces an effect that cannot be secured by the use of a runner-head or pouring-chamber communicating with the mold proper by a simple vertical or an inclined passage receiving the metal at the bottom—plans which have heretofore been proposed. The dross and scoria, being on the surface of the metal, are the first to enter the sprue or pouring-chamber, and therefore enter such vertical or inclined passage before a sufficient body of pure metal is poured to raise such impurities above the receiving-mouth of such passage. Hence they are carried into the mold. By my plan, however, such impurities are thrown upward and back upon the top of the pure metal, which passes freely into the mold. In some cases the second gate may be omitted, and in others more than two gates may be used.

The gist of this invention consists in providing the bottom of the pouring or receiving chamber with one or more inclines, and arranging in rear of such incline or inclines a gate or gates, which shall hold back the impurities while allowing the pure metal to flow under.

The chambers H and I may be simply cavities formed in the top of chamber E, or said chamber may be made high enough to render them unnecessary.

Having thus described my invention, what I claim is—

1. In a runner or head-gate for molds, the combination of an inlet, a horizontal chamber or passage provided with an incline on its bottom, and a gate arranged in rear of said incline, and adapted to intercept or hold back impurities while permitting the pure metal to pass beneath it.

2. In a head-gate or runner for molds, the combination of a sprue or inlet, a horizontal chamber having an incline on its bottom, a gate arranged in rear of said incline adapted to intercept and hold back impurities, and a chamber above the incline to receive said impurities, substantially as shown and described.

3. In a mold, a runner or head-gate consisting of sprue D, chamber E, having inclines F G, gates J K, chambers H I, and passages *a*, *b*, *d*, and *e*, all arranged substantially as and for the purpose set forth.

4. A head-gate or runner for molds, provided with an inlet, a horizontal chamber or passage communicating therewith and with the mold proper and provided with two or more inclines rising from its bottom, and gates arranged one in rear of each incline and set successively closer to said inclines, substantially as described and shown, whereby the impurities are intercepted and thrown to the top, and a channel of decreasing area is formed for the passage of the pure metal to the mold.

JOSEPH HARRISON.

Witnesses:
WILLIAM W. DODGE,
WM. W. ALLIS.