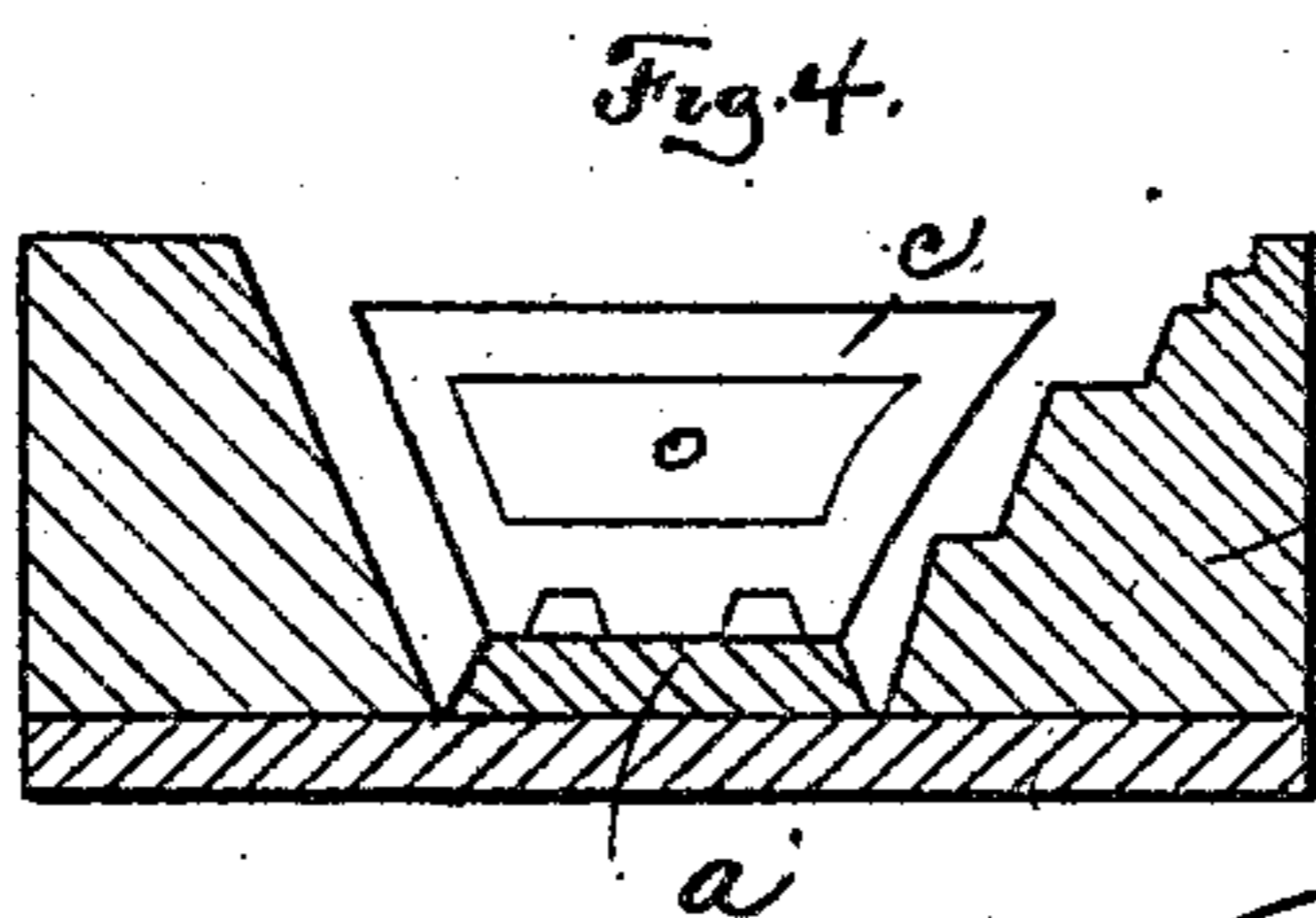
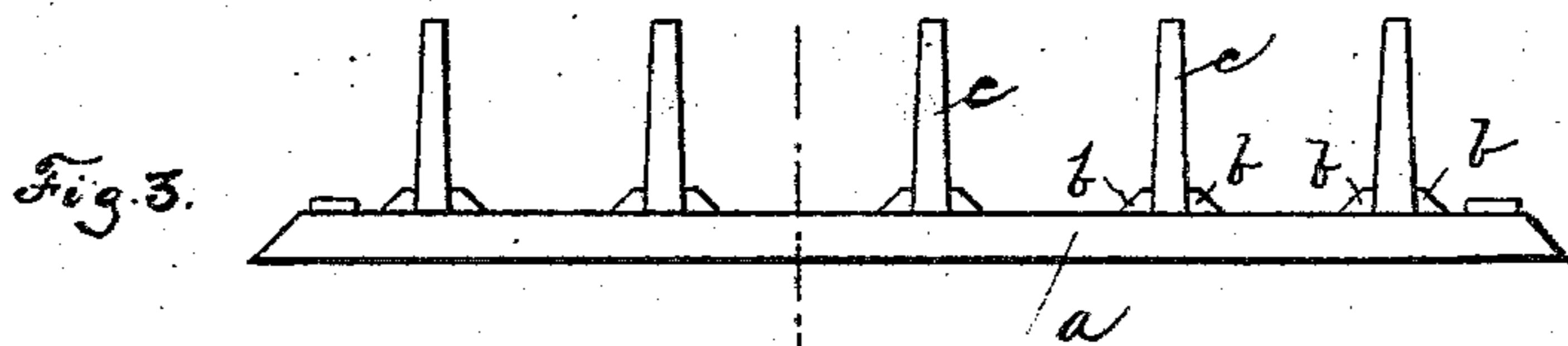
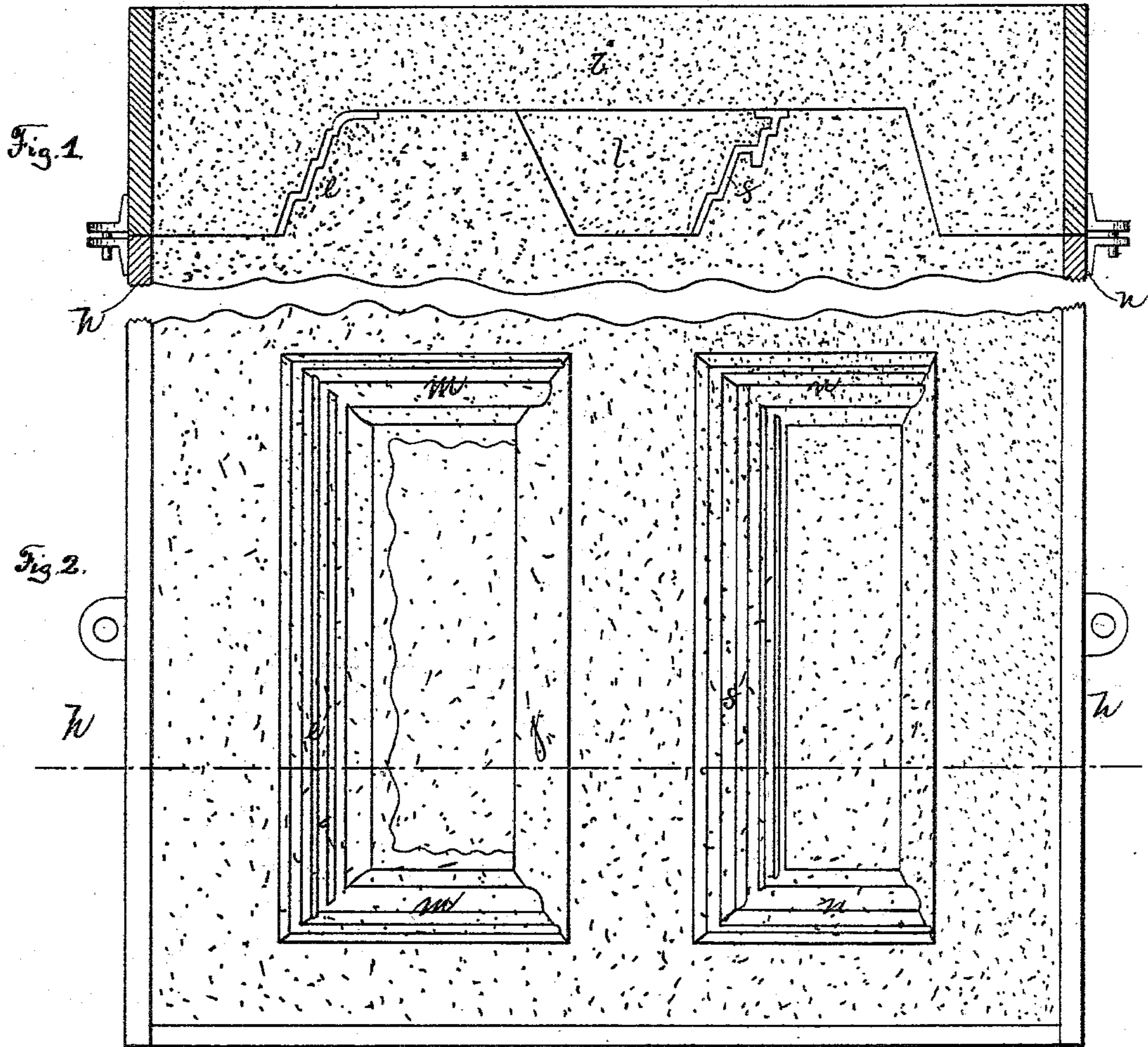


(No Model.)

J. HOUSTON.
SAND CORE FOR CASTING.

No. 283,344.

Patented Aug. 14, 1883.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN HOUSTON, OF BROOKLYN, NEW YORK.

SAND CORE FOR CASTING.

SPECIFICATION forming part of Letters Patent No. 283,344, dated August 14, 1883.

Application filed April 26, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN HOUSTON, a citizen of the United States, and resident of Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Sand Cores for Casting, of which the following is a specification.

My invention relates to the sand cores used by molders in the making of molds for casting metal; and it consists, essentially, of an improved contrivance of frames or foundations for cores for molding the frames of safe and vault doors, or any doors of similar form, of which the frame is cast in one solid piece, all as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1 is a transverse section of the mold for casting a safe-door. Fig. 2 is a plan view of that part of the mold that is formed in the drag or nowel. Fig. 3 is a side elevation of the skeleton frame of my invention for the making of cores, said skeleton being in this case adapted for the molding of safe-doors; and Fig. 4 is a cross-section of the said frame and the core-box in which the sand core is built upon the frame.

In casting a door-frame or any equivalent form of device solid, in which there results considerable contraction of the metal upon the central part or core of the mold, dry or baked sand cores are objectionable, because they are so hard and solid that they resist the contraction so much that the castings are frequently broken, but at the same time they are mostly used because they can be made quicker and with less labor than a green-sand or common molding-sand core of sufficient stability can be made in the common way of making it.

The reason why the dry-sand core can be made so easily is that, being made of a mixture of coarse, sharp sand, flour, and molasses, or other adhesive material that will bake sufficiently hard and solid to hold together when the metal is poured, but little labor is needed to make it up, while the green-sand core must be so strongly tied and bound by skeletons of intricate ramifications that the sand will be sufficiently stable by that alone for withstanding the molten metal when poured into the mold.

It is more desirable to use the green sand

than the dry, because it is fine-grained, and makes smoother surfaces to the castings, and being unmixed with any cakey substance it may be used continuously, whereas the sharp, coarse sand necessarily used for adhesion with the pastry material makes the surfaces of the casting rough, and goes to waste after being once used.

To avoid the labor of specially constructing the skeleton or base for each core by means of wires, special skeleton frames of cast metal have been made by casting cross-plates, arms, and other projecting parts on a base-plate or mold-board, whereon the sand may be packed and substantially held for practicable cores; but the difficulty in such device is that the cross-plates and other projecting parts break off in handling and carelessly using the frames, rendering them useless. I therefore propose to construct such foundation-frames for the making of green-sand cores by casting the base-plate *a* with dovetail lugs *b* only, making the cross-plates, arms, or other projecting parts, *c*, separately from said base-plate, but adapted to connect readily therewith by sliding into the notches or grooves of the lugs, so that when the device is not in use the said cross-plates, arms, or other projecting parts may be readily detached and piled up, so as to prevent the danger of breaking by careless handling or by the falling of other objects against them; but the more special object of the said construction is that when any one of the cross-plates or other projecting parts does break or become useless by any cause it can be readily replaced by another. The said plates *c* are to be cast with openings *o* of any form of arrangement through them, or with notches of any kind, in which the sand is to interlock for binding fast to them, and they will be placed as close together as is needful for affording substantial adherence of the sand.

These improved skeleton frames or foundation-plates will be made in any desired arrangement of form adapted to the form of casting to be made—for example, in the making of molds for the casting of safe-door frames, part of which has to be cored, because the two side portions of the frames are beveled or inclined the same way at *e* and *f*, Fig. 1, so that a plain pattern could not draw out of the sand. I make a base-plate, *a*, much narrower than the width

between the sides of the frame represented by the cross-sections of the molds *e f*, Fig. 1, and also by the top views *e' f'* of the lower sides of said mold in Fig. 2, which represents the nowel
 5 or drag *h*, made by a plain pattern, while *i*, Fig. 1, represents the cross-section of the upper part of the mold in the cope, also made by a plain pattern, the said plate *a* being a little less in width than the space between the side
 10 *f'* of the mold and the beveled side *j* of a part of the inner portion of the mold formed by the plain pattern in the drag for the door-frame, said plate *a* also being a little less in length than the length of the side *f'* of the mold, and
 15 the cross-plates *c* being of equal length on the edge fitting in the dovetail lugs to the width of the base-plate, or thereabout, and widening each way to the upper edge in about the same angles as the angles of the sides *f'* and *j*, respectively, but not extending quite as high
 20 as said sides, which skeleton core-base thus made I place in a core-box, *d*, corresponding in form and dimensions with the place to be filled by the core in the mold and pack the
 25 sand thereon, as in the making of other cores, producing the core *l*, of which a cross-section is seen in Fig. 1, the ends of which will be made by the core-box in conformity with the
 30 ends *m* and *n* of the part of the mold represented in Fig. 2. The core thus made is then placed in its place between sides *f'* and *j*, and the joint or seam along the side *j* and at the ends of the same is closed or packed by the
 35 trowel, so that said core, together with the part *e' j m*, makes the mold for the interior of the door-frame, while the cope and the part *f'*

of the drag make the mold for the exterior, the cope-mold being so shaped that it closes tightly against the ends *n* of the drag-mold, and prevents the metal from flowing beyond 40 or to the right hand of side *f'*.

Thus I have a green-sand core for the interior of the door-frame, on which it may contract without material or dangerous resistance, said core being made cheaper than the dry- 45 sand core can be, including the baking, said core being made on a core-base, which may be readily taken apart when not in use, and be so disposed as to avoid danger of breaking, or, if broken, may be repaired with the cost 50 of the broken part only.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The improved skeleton core-base or frame 55 for a core for safe-door molds, consisting of plate *a* and detachable cross-plates *c*, said plates being of shorter dimensions on the lower edge, which connects with the base-plate, than on the other edge, and being inclined from 60 said lower edge upward in about the angles or inclinations of the side *f'* of the mold and the bevel side *j* of the part of the mold for the interior of the door-frame formed by the pattern, substantially as described. 65

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN HOUSTON.

Witnesses:

W. J. MORGAN,
 S. H. MORGAN.