(No Model.)

J. H. BLESSING.

APPARATUS FOR MAKING DRY SAND CORES.

No. 315,465. Patented Apr. 14, 1885.

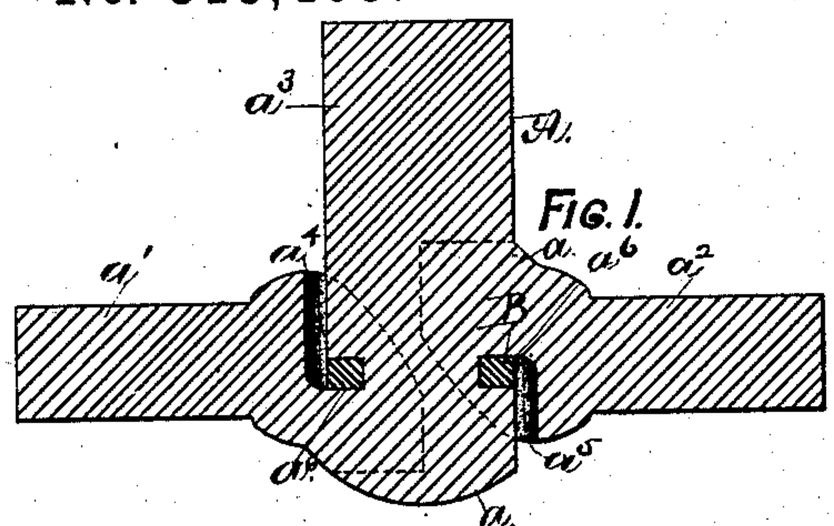

FIG. 1.

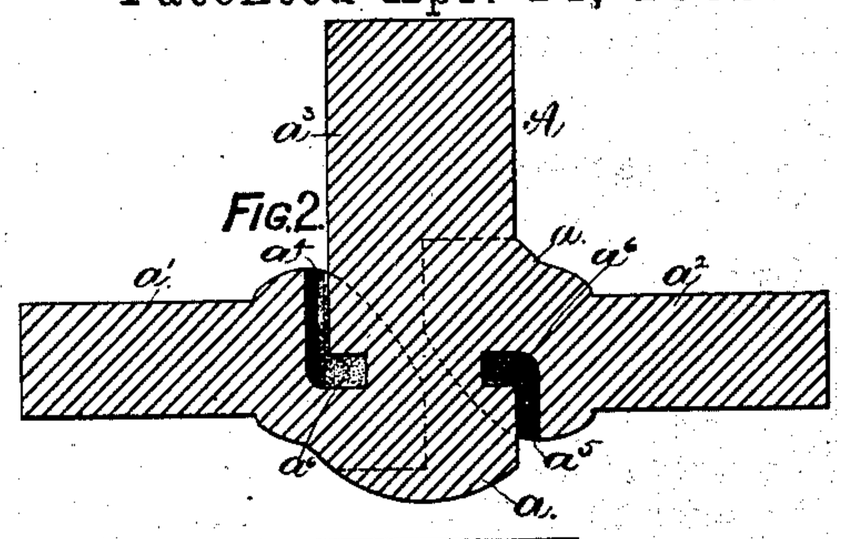

FIG. 2.

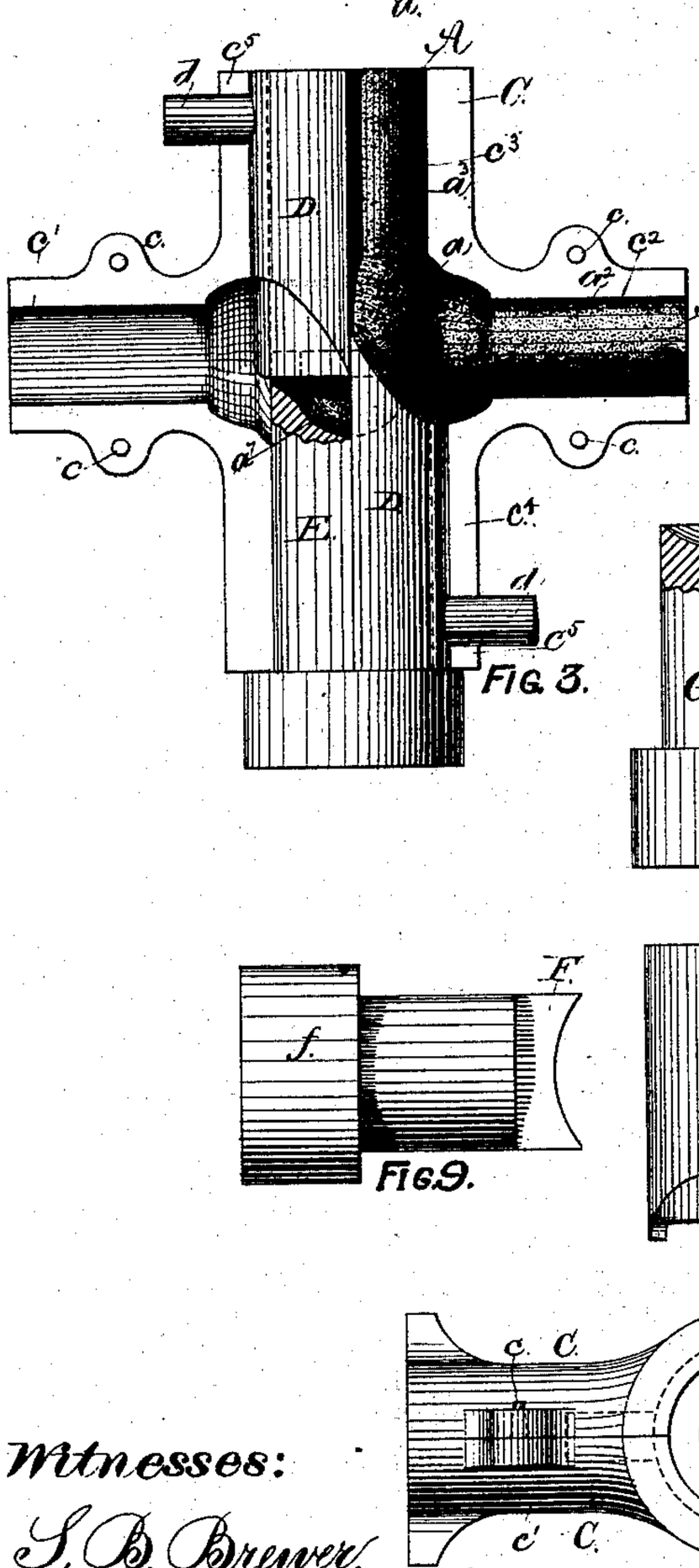

FIG. 3.

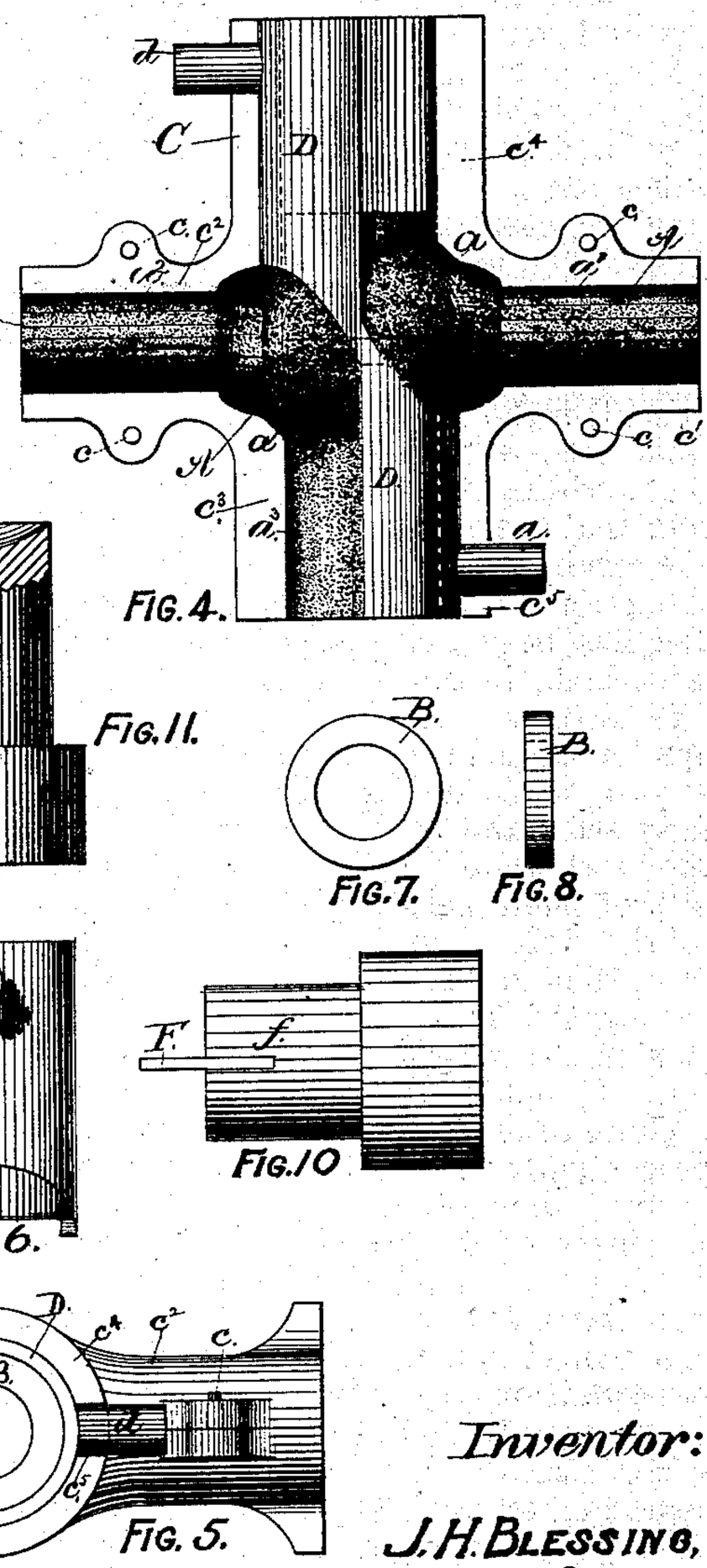

FIG. 4.

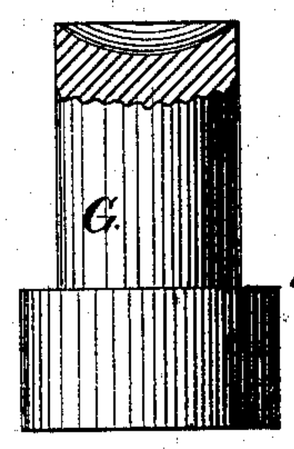

FIG. 11.

FIG. 7. FIG. 8.

FIG. 9.

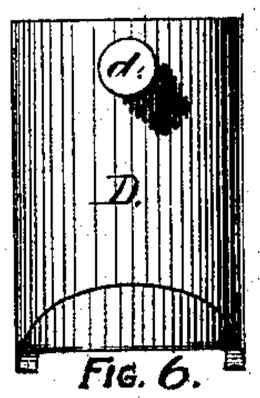

FIG. 6.

FIG. 10.

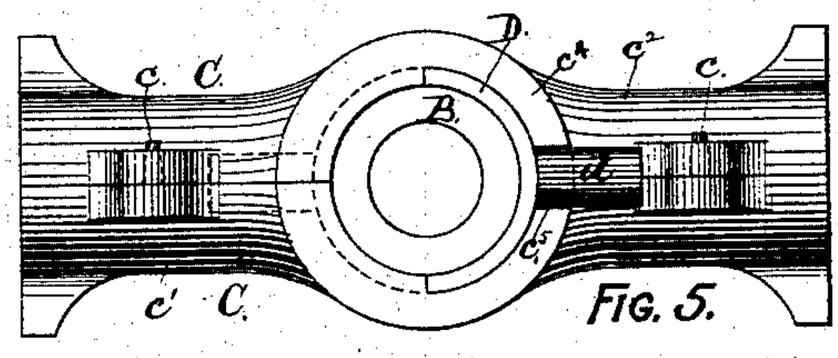

FIG. 5.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR MAKING DRY-SAND CORES.

SPECIFICATION forming part of Letters Patent No. 315,465, dated April 14, 1885.

Application filed July 30, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BLESSING, of the city and county of Albany, in the State of New York, have invented certain new and useful Improvements in Core-Boxes for Making Dry-Sand Cores, of which the following is a specification.

In making castings with internal parts of irregular or complex forms great difficulty has heretofore been experienced in forming the cores, as in many cases the metal is required to be cast into parts of the core that are inaccessible when the core is made as an entirety. This fact has led to the practice of dividing and subdividing the core into many parts, in order that the otherwise inaccessible places may be reached to secure proper formations for the required casting; but the aforesaid practice has been attended with other difficulties, which, in addition to the increased cost of making suitable core-boxes, have been a source of frequent loss, for the reason of the liability of these multiplex cores being improperly set in the molds, even when the work is done by the most skillful men, and of the liability of their being displaced by the action of the molten metal as it enters the mold, and in either case the result will be the loss of the casting. These defects are serious when only a single casting of the above-named kind is required; but when many castings of the same kind are required to be made every day the percentage of loss becomes a most important item in the cost of manufacture.

The object of my invention is to remedy these defects by providing a means for making any intricate core as an entirety, which may be placed in a mold in a complete and perfect condition for receiving the liquid metal into its most remote and apparently inaccessible openings.

The accompanying drawings, which, being herein referred to, form part of this specification, illustrate my invention as adapted to making cores for globe-valve-casing castings. In said drawings, Figure 1 is a longitudinal section of a core for a globe-valve casing with the wax model for forming the valve-seat in place; Fig. 2, a like section after the wax model has been melted away; Fig. 3, a side elevation of one-half of the box for making said core, showing the core partially formed; Fig. 4, a like view showing the core in a more advanced state of completion; Fig. 5, a plan view of the core-box with the destructible seat-model fixed in position; Fig. 6, a front elevation of slide for forming semi-cylindrical partition in said valve-casing. Figs. 7 and 8 are respectively a plan view and edge view of the destructible model for the valve-seat. Figs. 9 and 10 are respectively a side and edge view of a scraper for removing the surplus material from the under part of the spherical portion of the core, and Fig. 11 a side elevation and partial section of the print-block for finishing the said under part of the spherical portion of the core.

As represented in the drawings, A is the core for the casting of a globe-valve casing consisting of a spherical portion, *a*, and cylindrical stems a', a^2, and a^3, said stems forming, respectively, the induction, eduction, and bonneted openings for said valve-casing. Said core also contains the following spaces: a^4, in which the upper semi-cylindrical partition of the casing is formed; a^5, for the lower semi-cylindrical partition, and a^6 for the valve-seat. In the last-named space an annular flange is produced which continuously connects the upper and lower semi-cylindrical partitions and forms the valve-seat of the casing.

The destructible model B is preferably made of wax that will melt at a gentle heat, but having sufficient tenacity to protect it from injury during the operation of ramming the sand into the core-box. In the example selected for illustrating my invention the said model is made in the form of an annulus, as shown in Figs. 7 and 8; but its form may be changed in any way to suit the purpose for which it is required.

The core-box for forming the core above described consists of the two corresponding parts C parted longitudinally, held in position by means of dowel-pins *c*, and having at its central part a hollow globular portion, for forming the spherical portion *a* of the core, from which radiate the cylindrical barrels c', c^2, c^3, and c^4, in the first of which is formed the stem a', in the second the stem a^2, and in the third the stem a^3. The barrel c^4 is provided for the purpose of facilitating the operation of form-

ing the space a^5, holding the destructible model B in the first stages of making the core and finishing the lower part of the spherical portion of the core. The semi-cylindrical slides D are fitted to slide into the barrels c^3 and c^4, one slide being inserted in each barrel so as to lie relatively at diametrically-opposite sides, and wherein they join to contracted portions of the bore of said barrels, as shown in Fig. 5, to form a cylindrical bore of uniform size. The inner ends of the two slides D extend past each other to a distance equal to the thickness of the seat-model B, so that the two semi-cylindrical partitions cast in the spaces formed by said slides will be flush with the valve-seat at their respective sides. The slides D are provided with studs d, which project through slotted openings c^5 in the core-box, so as to facilitate the removal of said slides from the core-box after the core is formed. The cylindrical plug E is fitted to enter the barrel c^4 of the core-box, and is of sufficient length to support the seat-model B in its place during the first stages of forming the core. The inner end of said plug is provided with a concavity for producing a button-head, a^7, of compacted sand, which enters said concavity through the central opening of the seat-model, for the purpose of holding said seat-model in place after the plug E is withdrawn. The scraper F is inserted in a cylindrical stock, f, which is fitted to rotate in the bore of the barrel c^4. The blade of said scraper is designed for the purpose of removing any excessive quantity of sand that may be rammed into the barrel c^4, and it is so proportioned that it will leave the spherical portion a of the core in a nearly finished condition. The print-block G is fitted to slide into the barrel c^4, and has in its upper end a concavity which conforms to the surface of the spherical portion a of the core. The said print-block is so proportioned in length that when forced down into place, after the scraper F has performed its function, it will compress the sand at the lower part of the spherical portion a of the core and finish that portion to a perfect spherical form.

The mode of making cores in the above-described core-box is as follows: The two parts C of the core-box being clamped together, and the slides D, cylindrical plug E, and the destructible model B inserted in their respective places, the core-sand is rammed into the barrels c^2 and c^3 to form one part of the spherical portion a, cylindrical stems a^2 and a^3, and the button-head a^7, as shown in Fig. 3. The plug E is then withdrawn, and, with the core-box in a reversed position, core-sand is rammed in to fill the barrel c^4, as shown in Fig. 4, thereby forming the stem a' and filling the cavity for the spherical portion a. By this operation last described the core-sand last introduced becomes incorporated with that of the button-head a^7, so that the core will be a complete unbroken body throughout its entire structure. The scraper F is next inserted in the barrel c^4, and by rotating it the surplus of the sand is scraped from the lower part of the mass for forming the spherical portion a. After this surplusage of sand is emptied from the barrel c^4, the print-block G is inserted in said barrel and forced down to its place to finish the lower part of the spherical portion a and complete the formation of the core. After withdrawing the print-block G, the slides D are drawn out, and one part, C, of the core-box is removed. A metallic shell of suitable form to receive the sides of the core uncovered by the removed part of the box, and having in its concavity for receiving the spherical portion of the core a drainage-hole for the escape of the melted wax, is placed on the uncovered side of the core, and the whole is turned over so that the core will lie in the metallic shell, after which the remaining part of the core-box is removed, leaving the unbaked core (with the destructible model B in place, as shown in Fig. 1) resting in the metallic case. The latter and its contained core is then placed in an oven for the purpose of baking or drying the core, and in the latter operation the wax model will be gradually melted away without disturbing the sand-atoms of the core, (the melted wax will escape through the drainage-hole in the metallic shell,) and leaving the required space a^6 for the valve-seat, as shown in Fig. 2.

For heavy castings, which require strong and heavy cores, the destructible models may be made of any alloy that will fuse at a low degree of heat, and said models may then be retained in the core until they are melted away and dissipated by the molten metal as it enters the mold to form the required casting.

I claim as my invention—

A core-box for forming cores of the character herein described, consisting of the corresponding parts C, semi-cylindrical slides D, and destructible model B, the said several parts being constructed, combined, and arranged to produce the required form of said core in the manner substantially as specified.

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Witnesses:

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