(No Model.)

C. S. BELL.

METAL MOLD.

No. 382,633. Patented May 8, 1888.

Fig. 1

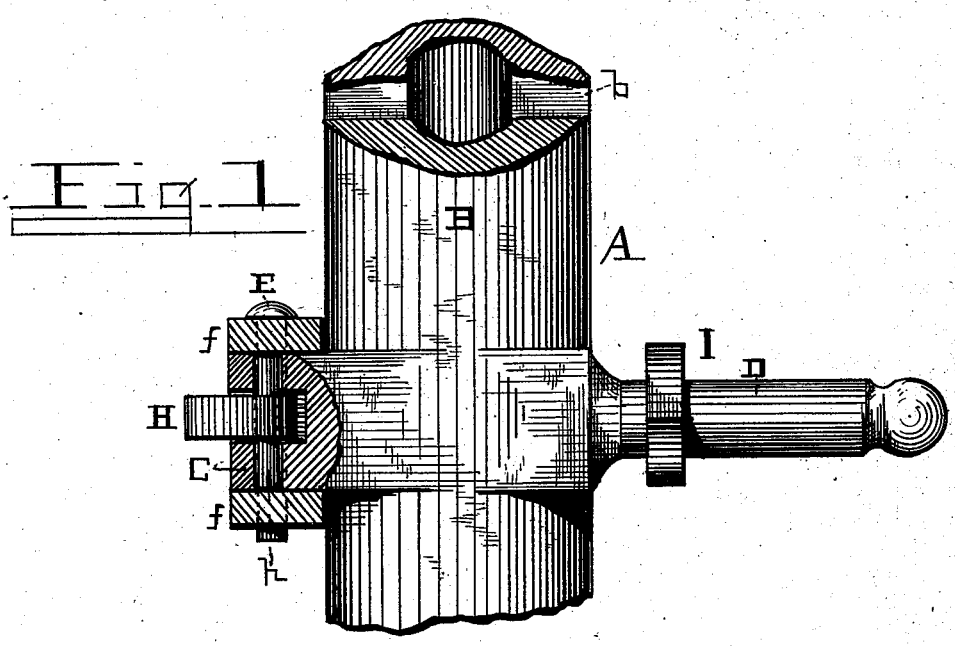


Fig. 2

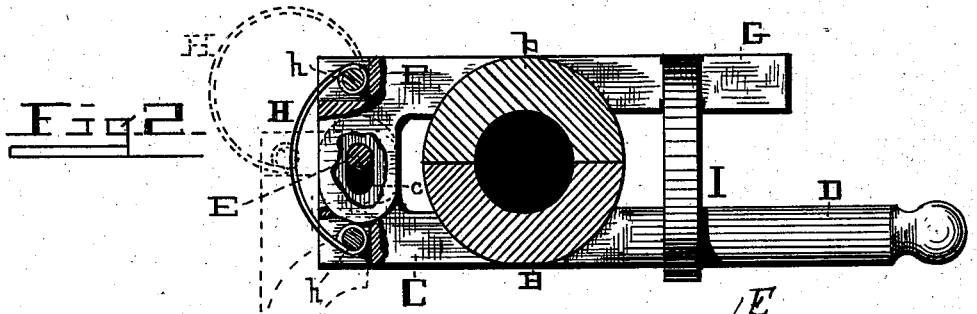
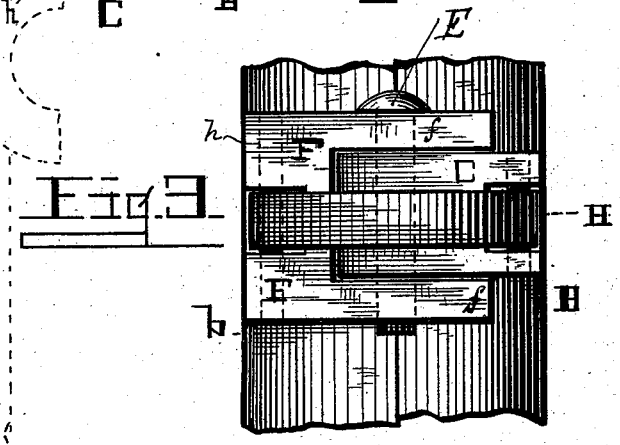


Fig. 3



Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES S. BELL, OF HILLSBOROUGH, OHIO.

METAL MOLD.

SPECIFICATION forming part of Letters Patent No. 382,633, dated May 8, 1888.

Application filed September 24, 1887. Serial No. 250,602. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. BELL, of Hillsborough, in the county of Highland and State of Ohio, have invented certain new and useful Improvements in Metal Molds; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 is a side elevation, partly in section, of a mold embodying my invention. Fig. 2 is a top plan view of the same, shown closed in full lines and open in dotted lines. Fig. 3 is a rear view showing the hinge-joint of the mold.

This invention relates to improvements in metal molds, and its object is to produce a sectional mold, the parts of which are so united that when in use the expansion of cast-iron at the moment of its chilling will be compensated for without injury to the rigid portions of the mold, and without permitting the casting to ridge or run into the joints between the sections of the mold, thereby producing a perfect casting, smooth on its exterior opposite the joints of the mold. This object it has been heretofore impossible to attain where sectional molds were rigidly united or locked during the process of casting, as with such molds the molten metal enters the joints, or by its expanding breaks the mold, or the casting is itself distorted and rendered imperfect or worthless. The use of sand molds, which permit the expansion of the castings when cooling or solidifying without injury thereto, is objectionable for simple castings, from the fact that only one casting can be made therefrom, the sand having to be remolded after each operation, thereby rendering the employment of such molds costly and the production slow. By my present invention I attain the objects stated, and produce a sectional mold that possesses the advantages of sand molds and obviates the objections to the rigid molds.

This invention consists, essentially, in a two-part metallic flask containing the matrices, which parts are hinged together and connected in such manner that while held normally in close contact with each other, yet they can yield or separate sufficiently to compensate for the expansion of the casting, as more fully hereinafter set forth.

In the accompanying drawings I have represented a mold used for producing cylindrical weights, such as are used for sashes; but I do not wish to confine myself to a mold for producing these castings only, as the invention is applicable for use in producing many of the ordinary simple free castings.

Referring by letters to the drawings, A designates a mold-flask made in two equal longitudinal or vertical halves, B *b*, on the inner faces of which are formed the coinciding halves of the matrices proper for outlining the casting. These parts B *b* are made preferably of cast metal, and of a size regulated by the dimensions of the casting to be produced. From the outer surface of part B extends an arm or lug, C, and in line with said lug, on the opposite side of part B, is a handle or lever, D, as shown. The lug C and handle D are preferably made integral with part B, or rigidly united thereto. The lug C is perforated vertically at *c*, for the passage of a hinge-bolt, E, hereinafter referred to.

On the opposite half, *b*, and corresponding in position thereon with the lug and handle on the part B, but facing the latter, are formed, respectively, the lug F and handle or arm G. The handle G is shorter than the handle D, but stands parallel therewith when the flask is closed. The lug F, however, is provided with two projecting arms, *f f*, on its inner face, which arms are adapted to embrace the lug C of the part B, and are perforated for the reception of the hinge-bolt E, which, when in place as shown, secures the parts B *b* together by a hinge-joint. The bolt-opening *c* through lug C is elongated in cross-section, as shown, at right angles to the division-line of part B, so that if said parts B *b* were closed together, as shown in Figs. 1 and 2, the loose hinge would permit the inner adjoining edges of the parts nearest the hinge to slightly separate, and a seam would be formed on the casting and render it imperfect. To obviate this danger and preserve a close joint of the parts B *b*, a spring is employed to draw the lugs F C, and consequently parts B *b*, together, and

hold them thus while the metal is poured into the mold. This spring, while being powerful enough to hold the parts as described, will yield when the casting expands upon its first chilling, and thereby prevent breakage of the flask or mold, or injury to the casting by undue compression.

In the present instance I have shown a plain metal band-spring, H, which is bent on an arc normally of about three-quarters of a circle. The ends of this spring are bent around pins *h h*, secured in suitable recesses in the outer end faces of lugs C F, as shown. When the flask is closed, the spring is distended, and consequently exerts a powerful pressure on the lugs to draw the same together. When the flask is opened, the pins *h h* are thrown nearer together, and the spring regains its normal curvature, as shown in dotted lines, Fig. 2.

To close the opposite joint of parts B *b* in a manner similar to the described joint, I connect handles D and G by a spring. In the drawings I have shown a curved spring, I, one end of which is secured to handle G, and the opposite end is adapted to be engaged upon the arm D and draw said arms G and H together, as is evident, when the flask is in use.

In the practical employment of my improved molds I purpose mounting a number of the same in rows around the melting-furnace, or in the line of movement of a swinging crucible, by means of their short arms G and lugs F, so that they can be rapidly filled and opened, and refilled without disturbing their position, as is evident. When the molds are filled, the molten cast-iron therein becomes chilled and hardened on its exterior, while its interior is yet molten. At this point careful observation and actual tests have demonstrated the fact that the body of iron expands to a degree yet greater than when in its molten state, and if provision is not made for this extreme expansion injury results to the mold, flask, or casting, as hereinbefore stated. By my invention the mold will yield to this expansion of the metal in time to prevent damage, but not until the exterior surface of the metal has chilled sufficiently to prevent its running into the openings between the joint of the mold.

In actual use my improved molds can be employed a number of successive times to produce the castings, which are turned out true to the pattern.

By mounting a sufficient number of the molds in the rows by the time the last mold is filled the metal in the first-filled mold has set sufficiently to permit its dropping from the mold by opening half B by its handle D, after disengaging spring I, as is evident, and then by closing the mold it is ready for another immediate charge of metal.

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

1. The herein-described mold composed of opposite halves hinged together by a loose hinge, and held together normally independently of the hinge by springs, to permit the halves to separate as the casting expands, substantially as specified.

2. The combination, in a metal mold, of the opposite equal halves loosely hinged together and provided with handles D G, with the closing-springs H I, whereby the parts are held together normally, but allowed to separate during the expansion of the casting, substantially as specified.

3. The combination, in a mold, of the halves B *b*, provided, respectively, with hinged lugs C and F, and handles D G, the lug C having its hinge-bolt opening enlarged, as described, with the hinge bolt E, the fixed closing-spring H, connecting the lugs C and F, and the hook-spring I, for connecting the handles D and G, all constructed and arranged substantially as specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHARLES S. BELL.

Witnesses:
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