

F. HAGGENJOS.  
MOLD FOR MAKING BRASS CASTINGS.

APPLICATION FILED JUNE 30, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

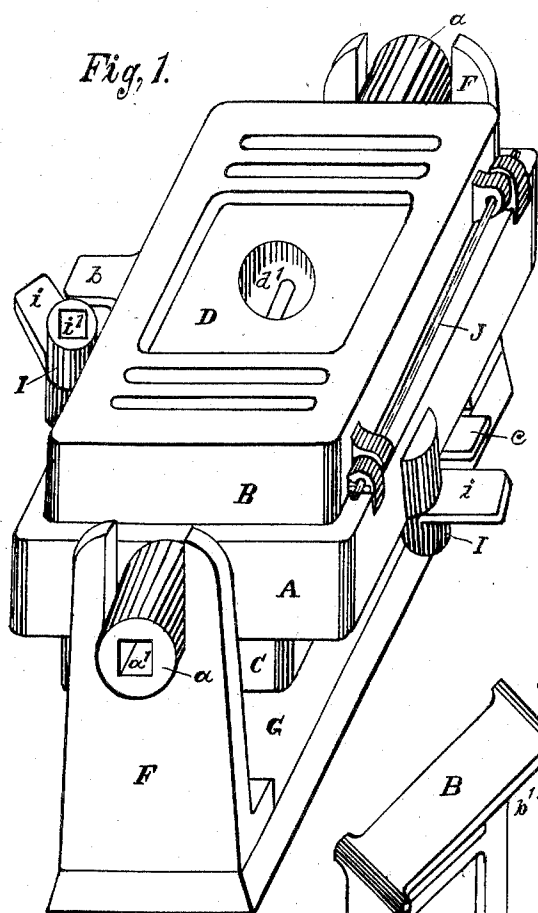


Fig. 3.

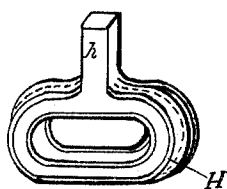
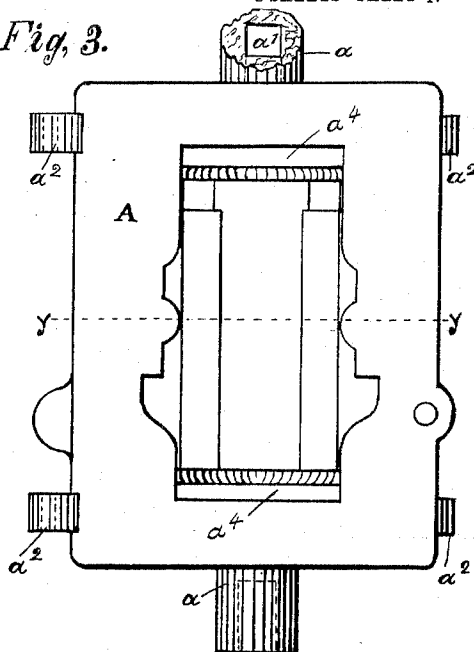
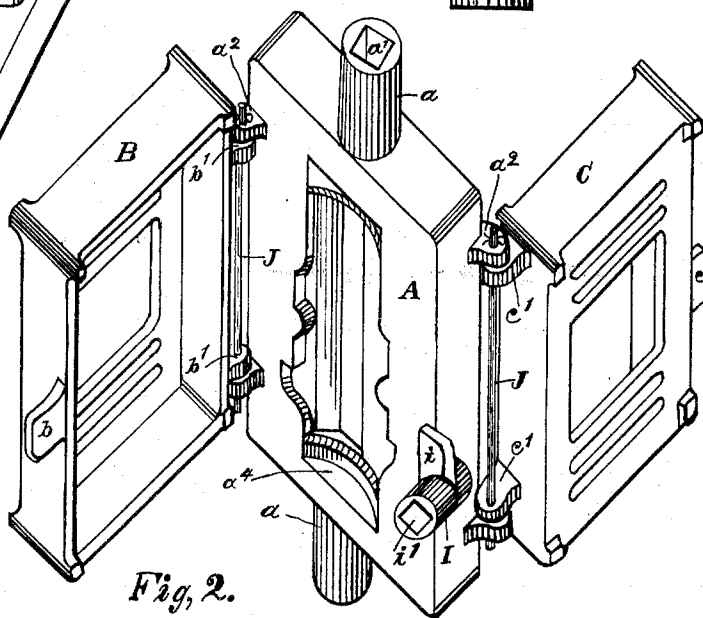


Fig. 4.

Fig. 2.

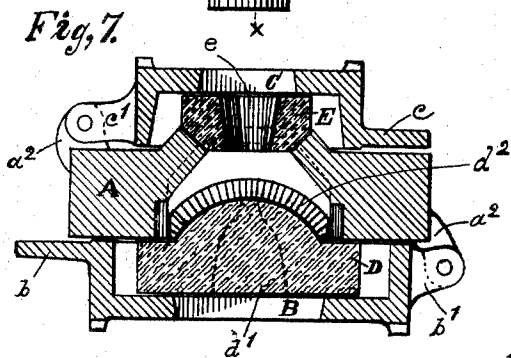
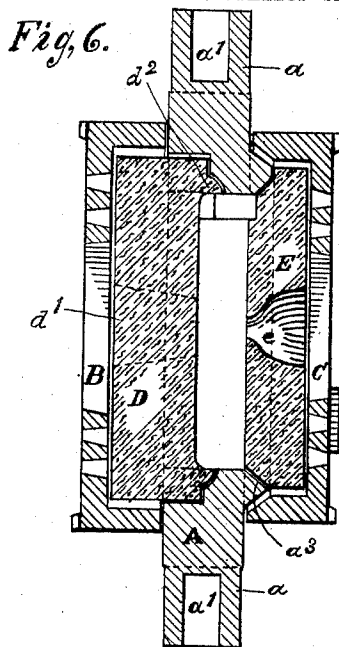
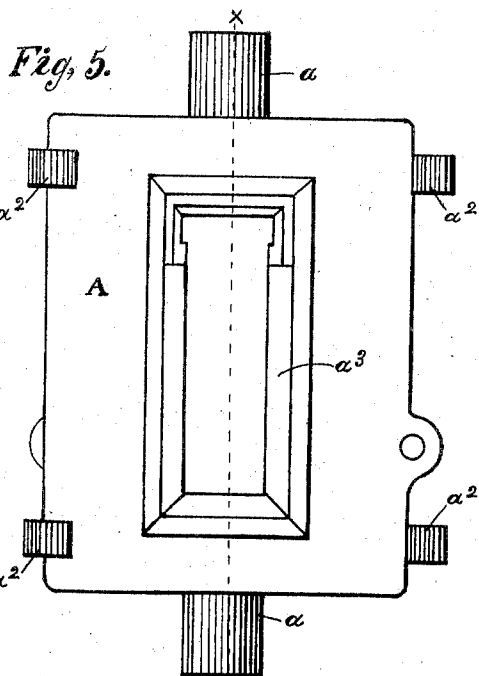


WITNESSES:  
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A. Schreiber

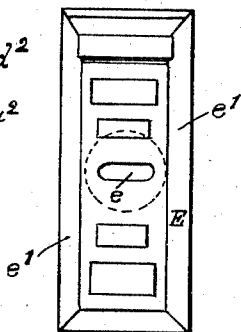
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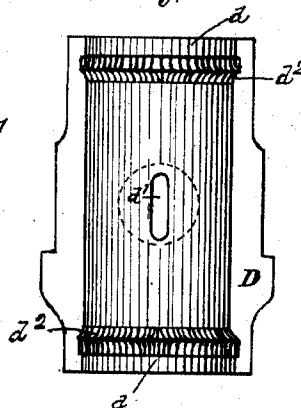
2 SHEETS—SHEET 2.



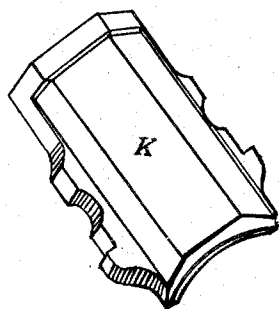
*Fig. 8.*



*Fig. 9.*



*Fig. 10.*



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# UNITED STATES PATENT OFFICE.

FRANK HAGGENJOS, OF ST. LOUIS, MISSOURI.

## MOLD FOR MAKING BRASS CASTINGS.

SPECIFICATION forming part of Letters Patent No. 783,577, dated February 28, 1905.

Application filed June 30, 1904. Serial No. 214,747.

*To all whom it may concern:*

Be it known that I, FRANK HAGGENJOS, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Metal Molds for Making Brass Castings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in metal molds for making brass castings, particularly such castings as are used in the various styles and kinds of journal-bearings used in all kinds of light and heavy cars for heavy and rapid transportation.

The objects of my improvements are to broaden the state of the art by the use of important and valuable experiments that I have made in my effort to produce a better result in the making of brass castings in iron molds by the construction of a mold form that can be made cheaper, operated easier, be more durable, and produce good castings more rapidly than the old way, and I design these features herein embodied to be improvements on my previous application now pending, which was filed May 5, 1904, Serial No. 206,513, in this same branch of the art. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the mold complete closed. Fig. 2 is a perspective view of the metal parts of the mold complete and opened. Fig. 3 is a face view of one of the sides of the middle section of the mold proper. Fig. 4 is a perspective view of one of the removable handles, which is used also as a wrench to operate the mold. Fig. 5 is a face view of the other side of the middle section of the mold proper. Fig. 6 is a longitudinal vertical center-cut section of the mold complete with its hard-sand fillings, taken on the plane of the broken line *xx*, Fig. 5. Fig. 7 is a vertical center-cut cross-section of the mold complete with its hard-sand fillings, taken on the plane of the broken line *yy*,

Fig. 3. Fig. 8 is a face view of the upper hard-sand filling for the back of the bearing. Fig. 9 is a face view of the lower hard-sand filling for the concave side of the bearing. Fig. 10 is a perspective view of a Master Car-Builders' bearing such as is turned out of the mold as it is shown in these various drawings, this one being selected as a good representation of the general class of bearings to which I apply this mold.

In all of the views like letters refer to like parts.

This construction of a mold I call a "combination reversible skeleton" mold, in which the combination is metal and hard-sand fillings. The reversible feature is that it can be used either side up, so that the mold may be filled by the molten metal through its back, or it may be reversed and filled by the molten metal through its bearing side. This is a necessity, as some railroads specify bearings poured from the back and some specify bearings poured from the journal or bearing side. The skeleton feature of the mold is that properly there is only one section of iron mold proper, and that is the center section, and the hard-sand fillings lie in their seatings or prints on each side of it and are held in position and protected by iron cages secured to the center section or mold proper by hinges and locking devices.

Before entering into a detailed description of the parts of my mold and their functions I will describe the mold complete as shown in Fig. 1. In this perspective view is shown the center section A, which is the mold proper, to which is hinged the two cages B and C and to which are also pivoted the locking-buttons I I, which hold the cages against the hard-sand fillings in their seats or prints in the center section A. The hard-sand filling D, with its gate-opening *d'*, is shown in the cage B in this view. This center section A is shown in this view with a pivot or trunnion *a* on each end of it which are provided with square sockets *a' a'*. These trunnions are arranged to fit into a saddle or hanger which consists of the two standards F F and the base-plate G, bolted together. When the mold is in this hanger, it can be easily turned

over to open and close the cages and insert the hard-sand fillings and remove the old fillings and the castings, and also all of the turning over, locking, and handling of the hot mold is done by the cool handles H, Fig. 4, inserted in the square sockets  $a'$  and  $i'$ , which is a great help in the rapid manipulation of the mold, these handles H being always taken out of the hot mold when not in use and used in a series of molds being operated together, and, further, as a general specification I have shown a perspective view of a casting K, Fig. 10, which represents the casting produced by this mold, as shown, except that the back of the casting is always provided with certain letters and figures—such as the initial of the railroad, the class of the bearing, the size of the bearing, the number of the pattern, and the maker of the castings. Also these bearings or boxes are in a number of different forms and sizes, but all have the general form of a back and a bearing surface and all are adapted to a position between the journal of the axle and the housing on the trucks of the car.

In a detailed description of the mold, A is the center section of the iron mold, which forms the whole exterior band of the casting-cavity and the beveled sides of its back, leaving only the flat portion of its back and the bearing side of the casting-cavity to be covered by the two hard-sand fillings D and E, Figs. 8 and 9. This center section is provided with trunnions  $a$   $a$ , having square sockets  $a'$   $a'$ , also two sets of hinge-lugs  $a^2$   $a^2$ , which match the hinge-lugs on the cages B and C. It is also provided with slight lug extensions on its edges, where the locking-buttons I I are pivoted by screws in the bottom of their square sockets  $i'$   $i'$ . The two face sides of this center section A are shown in Figs. 3 and 5. In Fig. 3 is shown the bearing side of the mold with the whole exterior band of the casting-cavity with the seatings or prints  $a^4$  for the hard-sand filling D and its fillet-flange extension  $a^2$ . The other side of this center section A (shown in Fig. 5) is the back of the mold, and it is provided with a raised beveled seating  $a^3$  for the hard-sand filling, so that in inserting the filling it always finds its proper seating the same every time and is easily retained by the cage C. In this form of a raised bevel-seating  $a^3$  I obtain a greater thickness of metal around this edge of the mold-cavity, which prevents the mold cracking and crumbling on its thin edge, as is shown in my former application mentioned.

The cages B and C are provided with hinge-lugs  $b'$   $b'$  and  $c'$   $c'$  to match the hinge-lugs on the center section A, and on the other side of each cage locking-lugs  $b$   $b$  extend out to turn the locking-buttons I I over. Both the lugs  $b$   $b$  and the buttons I I have inclined surfaces, so that they make up solid on a little variation in the thickness of the fillings. Also the

faces of the cages are perforated for the escape of the gas from the mold through the hard-sand fillings and to obtain an unobstructed space around the gate-opening through the fillings to the cavity of the mold. The cages are hinged to the center section by the hinge-lugs and the rods J J. The arrangement of the joints of the mold and the porousness of the fillings makes a perfect venting system for all parts of the mold-cavity.

The longitudinal center-cut section, Fig. 6, and the vertical center-cut cross-section, Fig. 7, showing the fillings all in their seatings, and the arrangement of the different parts in relation to each other gives a clear understanding of the mold complete. The hard-sand fillings are made so that there are four different kinds—two of E, Fig. 8, one with the gate-opening  $e$  in it and one blank, and two of D, Fig. 9, one with the gate-opening  $d$  in it and one blank. This is to suit the reversing of the mold. In setting up the mold to pour the molten metal in the bearing side of the mold-cavity the gate-opening must be in the filling D and the filling E must be blank or solid, and in setting up the mold to pour the molten metal in the back side of the mold-cavity the gate-opening must be in the filling E and the filling D must be blank or solid, so that the lower filling is always blank. In this filling D, I have also provided, in connection with the end fillets of the bearing-surface, an extension or narrow flange  $d^2$ , which protects the end surfaces where they come in contact with the shoulder and collar of the axle from being chilled into a hardened surface by the contact of the iron ends of the mold with the ends of the casting. (See sectional views, Figs. 6 and 7.)

By the use of this construction of a mold the loss in melting metal that forms the gate or sprue is less than a pound, while in some of the molds that I have examined the loss of melting metal in the gates is from four to five pounds.

I do not design to confine myself strictly to a hard-sand filling, but may use a filling of a composition that partakes of the hard and porous nature of a baked-sand core in the solid or blank fillings in the lower side of the mold. These molds vary in their size, weight, and proportion, according to the variation of the bearings to be cast.

I have carefully described the parts of my mold and their functions and relation to each other, and I believe I have fully described the manipulation of the mold in making castings in it. The advantage gained in the use of a number of molds worked together for the rapid production of castings is obvious, as by actual test with one mold I have produced castings at the rate of twenty castings per hour.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a metal mold for brass castings, the

combination reversible skeleton mold consisting of the central mold-section of iron having seated in its back and bearing sides hard-sand fillings secured to the said central section by the cages hinged and locked thereto, and provided with the gate-openings through the said fillings, and provided with trunnion ends on the said central section and mounted in the hangers and turned and handled with the attachable handles, as described and specified.

2. In a metal mold for brass castings, the combination of a central iron mold-section provided with the hard-sand fillings for the back and bearing walls of the casting-cavity, the said fillings held in their seatings and protected by cages secured to the said central section, and provided with gate-openings through the said fillings into the cavity of the mold, as described and specified.

3. In a metal mold for brass castings, the iron combination reversible mold provided with hard-sand fillings for the back and bearing side of the mold-walls, provided with gate-openings and secured in contact with the

central section of the mold by metal cages, as shown and described.

4. In a metal mold for brass castings, the combination of the hard-sand fillings with the skeleton iron mold forming the combination hard-sand and iron walls of the casting-cavity of the mold, and provided with gate-openings through the said fillings to the casting-cavity of the mold, the said fillings protected and held to their seatings by the iron cages, substantially as shown and described.

5. In a metal mold for brass castings, the combination skeleton mold consisting of the combination of hard-sand fillings seated in the metal central mold-section and provided with gate-openings in the said fillings and iron cages to confine and protect the said hard-sand fillings, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK HAGGENJOS.

Witnesses:

S. E. MARTIN,

A. SCHREIBER.