

E. PIPHER.
 FLASK FOR THE CASTING OF METAL BODIES.
 APPLICATION FILED DEC. 1, 1911.

1,028,603.

Patented June 4, 1912.

4 SHEETS—SHEET 1.

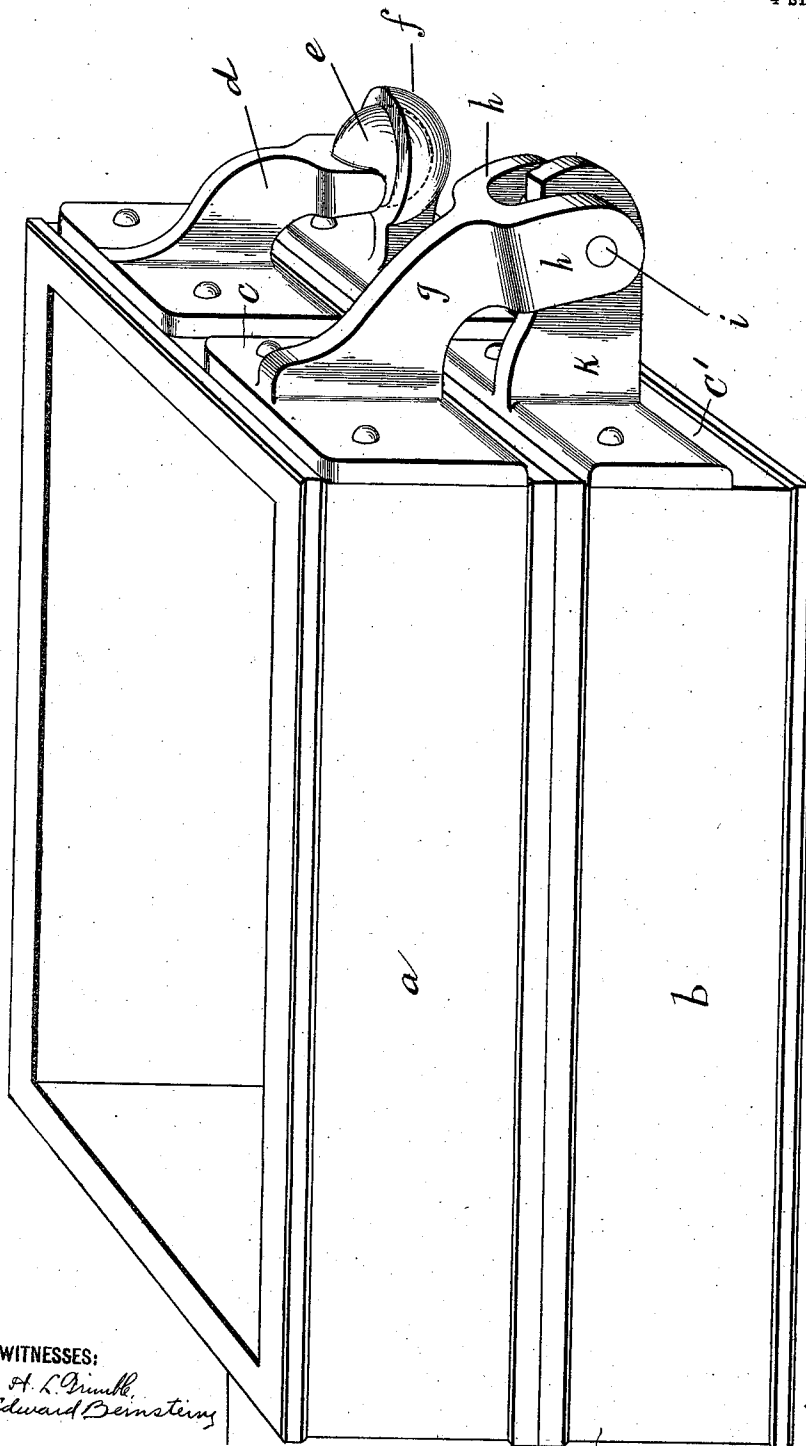


Fig. 1.

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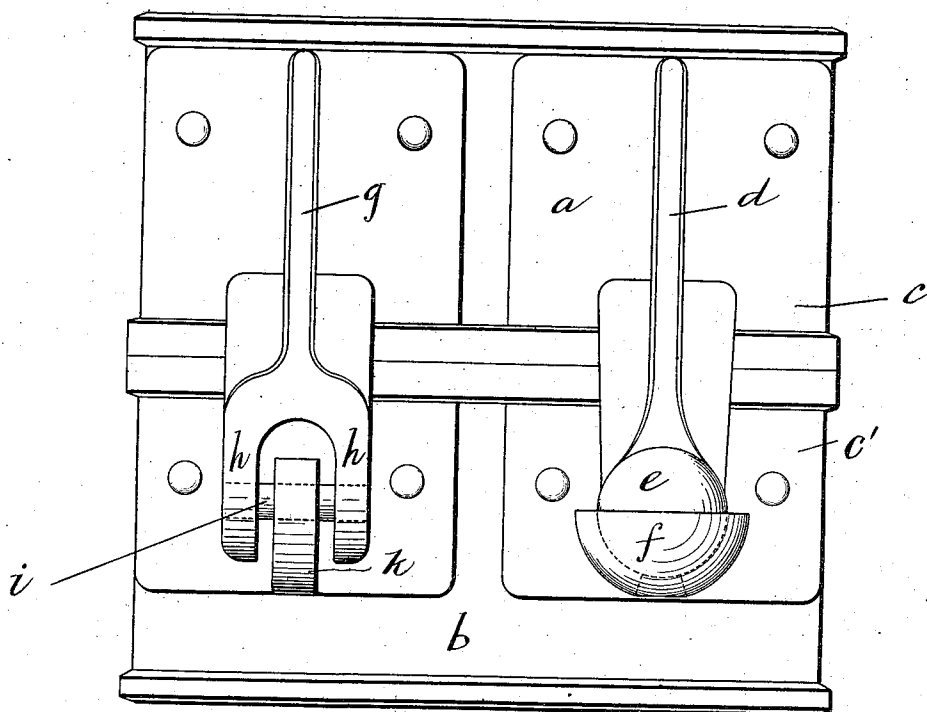


Fig. 2.

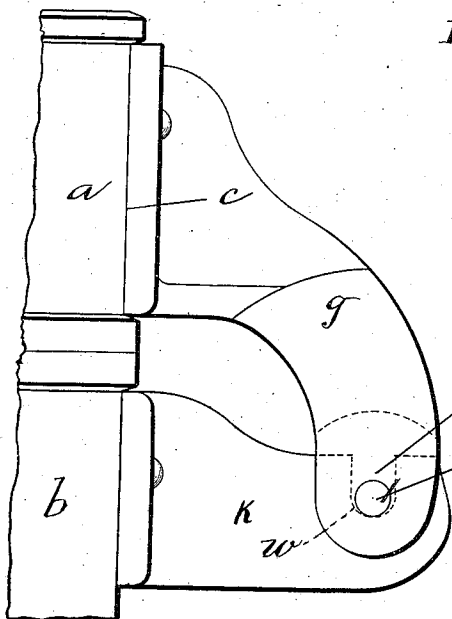


Fig. 3.

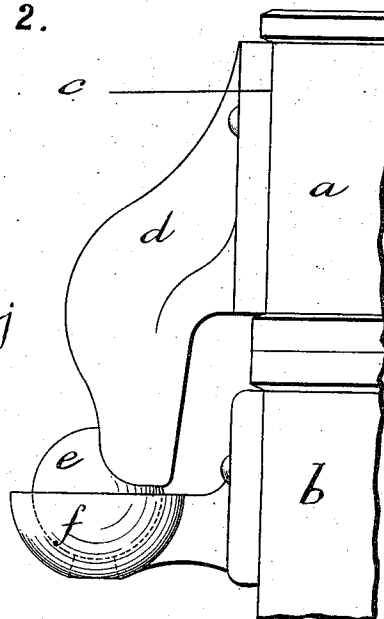


Fig. 4.

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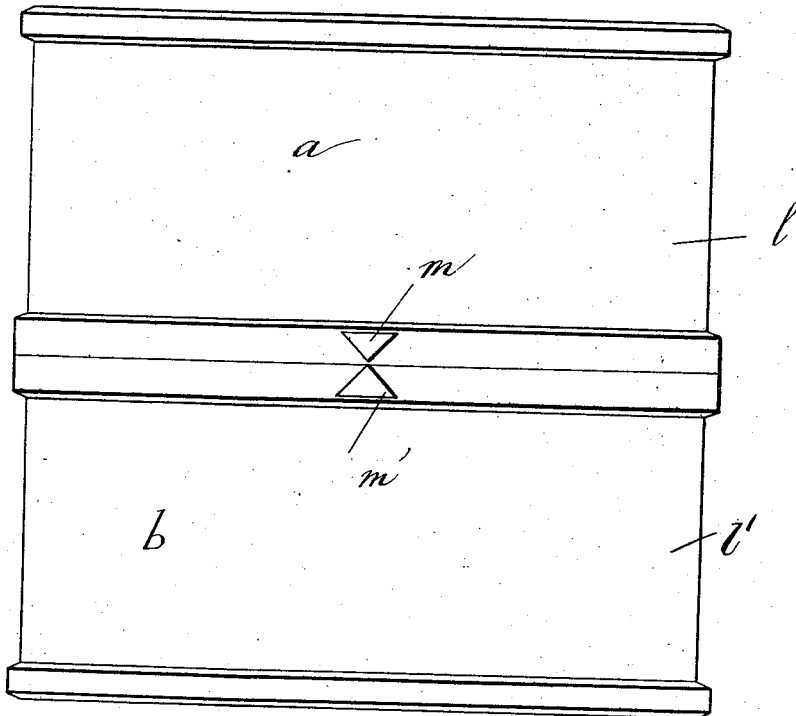


Fig. 5.

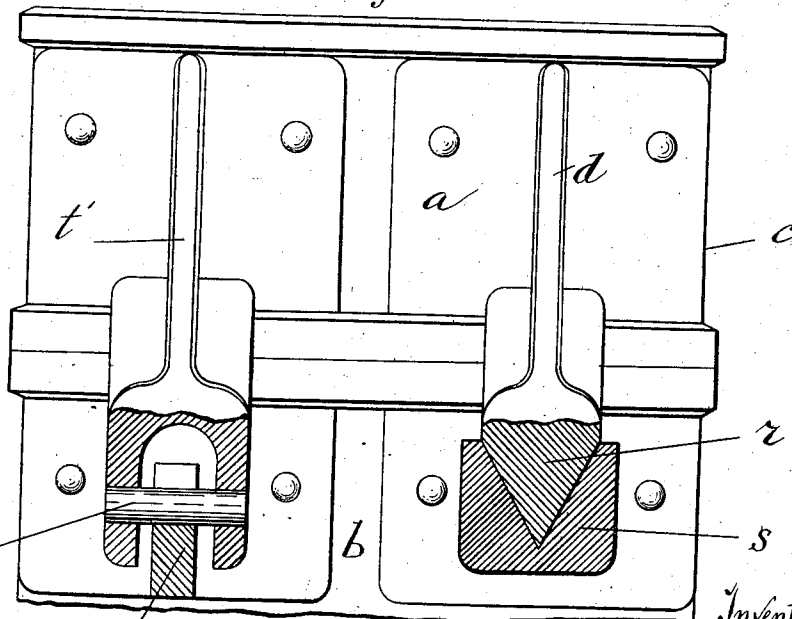


Fig. 6.

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 by 46 has 14 lines atty.

UNITED STATES PATENT OFFICE.

EDWARD PIPHER, OF PORT HOPE, ONTARIO, CANADA.

FLASK FOR THE CASTING OF METAL BODIES.

1,028,603.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed December 1, 1911. Serial No. 663,409.

To all whom it may concern:

Be it known that I, EDWARD PIPHER, of the town of Port Hope, in the county of Durham and Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Flasks for the Casting of Metal Bodies; and I hereby declare that the following is a full, clear, and exact description of the same.

In making an imprint of a pattern in closely packed sand to produce a mold cavity identical in conformation with that of the pattern, it is customary to use a flask consisting of two or more separable flask parts, each containing a section of the imprint, and it is also customary to provide each of the flask parts with steadying members to bring them together, so that the several sections of the imprint will constitute the mold cavity.

In the operation of a continuous foundry plant in which the mold is prepared, the cast made, the contents of the flask dumped out, and the mold re-prepared in the same flask, frequently in a period of twenty minutes or less, the flask sides, when several casts have been made in quick succession, become heated and expanded to such an extent that the steadying members heretofore used, will not bring the flask parts together so that there will be an exact correspondence of the several sections of the mold cavity, and then the consequent result is defective castings.

The object of my invention, therefore, is to provide the flask parts with means by which an exact correspondence may be effected between the several sections of the mold cavity when the flask parts are assembled for the cast, and this object is attained by providing each flask part with a set of centering steadying members, a set of adjusting steadying members, and a set of indicating members which will permit of the flask parts being accurately adjusted to each other.

For an understanding of my invention, reference is to be had to the following description and to the accompanying drawings, in which:

Figure 1, is a perspective view of a two-part flask showing the centering and adjusting steadying members; Fig. 2, is an end elevation of the same; Fig. 3, is a side elevational view of the adjusting steadying members shown in Fig. 2; Fig. 4, is a view similar to Fig. 3, but showing the centering

steadying members; Fig. 5, is a front elevation of the flask showing the indicating members; Fig. 6, is a view similar to Fig. 2, but showing in section a modified form of construction; and, Fig. 7 is a view of the cope with the pattern therein preparatory to receiving the sand.

Like characters refer to like parts in all the views.

I have shown in the drawings a flask consisting of a cope *a* and a drag *b*, which are of a box-like form and are adapted to separate along their meeting edges. Fixed to one side *c* of the cope *a*, as seen in Figs. 1, 2 and 4, is an arm *d* provided with a ball *e* adapted to enter a cup-shaped socket *f* fixed to the corresponding side *c'* of the drag *b*. The ball and socket, being of such dimensions as to snugly fit each other without loss of motion during the assembling or separation of the flask members, constitute a pivot about which the cope may swing, in a plane parallel to the drag, when being adjusted to bring its portion of the molded imprint of the pattern into exact correspondence with the imprint carried by the drag in order that a perfect mold cavity may be produced. Also, fixed to the side *c* of the cope is an arm *g* having a bearing pin *i* adapted to engage a slot *j* carried by an arm *k* projecting from the side *c'* of the drag. The free end of the arm *g* is preferably bifurcated, as shown, in order that its forks *h* may loosely straddle the projecting slotted end of the arm *k*, and provide sufficient play for the adjustment of the cope to the drag as the cope swings in a plane parallel to the drag from the pivot formed by the ball *e* and socket *f*, this adjustment being sufficient to meet all reasonable conditions of expansion and contraction of the flask parts. Fixed to the sides *l* and *l'* of the cope and drag respectively, which are opposite the sides *c* and *c'*, are the indicating members *m* and *m'*, by which the cope and drag can be accurately centered with respect to each other. In the preparation of the mold, I use a pattern fixed to a pattern block for each part of the mold, and provide the pattern blocks with indicating members in all respects similar to the said indicating members *m* and *m'*, as well as with adjusting and centering members similar to the members *g*, *k*, and *d*, *e*, *f* and the flask. For example, in making that part of the mold imprint carried by the cope *a*,

I employ a cope pattern R having a fixed position on the pattern block Q (see Fig. 7), and I provide this pattern block with a slotted projecting arm S in all respects similar to the arm *k* on the drag *b*, the arm S having the same relative location to the pattern R as the arm *k* has to the molded imprint. I also provide the pattern block Q with a socket *t* similar in all respects to the socket *f* and having the same relative location to the pattern R as the socket *f* has to the molded imprint. It therefore follows that the arm *g* and ball *e* of said cope, will so fit the arm S and socket *t* of the pattern block Q and also the arm *k* and socket *f* of the drag as to cause the mold imprint carried by the cope to occupy precisely the same position with respect to the drag that it occupied with respect to the pattern block Q when the mold imprint of the cope was being formed. The pattern block Q is further provided with an indicating member (not shown) located in a position, and of a construction exactly the same as that of the member *m'* on the drag, and for precisely the same purpose.

The mold imprint carried by the drag is prepared from a drag pattern fixed to a second pattern block (not shown) and provided with arms in all respects similar to the arms *g* and *d* of the cope *a*, and also with an indicating member similar to the indicating member *m*, the drag pattern carried by said drag pattern block being located in the proper relations to said cope pattern as to cause the mold imprint, when formed in the drag, to come into exact correspondence with the imprint formed in the cope when the parts of the flask are correctly assembled.

It will now be clear that in assembling the flask members with their respective pattern members, the parts corresponding to the ball *e* and pin *i* will always enter parts corresponding respectively to the socket *f* and slot *j*, and that the flask parts can always be adjusted around the ball *e* as a center until the indicating members *m*, *m'* register one with the other, in order to correct any errors due to expansion or contraction of the sides of the flask which would otherwise be encountered in the casting operation. This is what I call the centering of the flask, and is permitted by the slight play between the pin *i* and slot *j*, as indicated at *w* in Fig. 3, the pin *i* during such adjustment, having a limited sliding movement in its slot *j*.

It will now be clear that with my invention, by means of the indicating, adjusting and steadying members on the flask parts and pattern blocks, the flask parts can be correctly centered with their corresponding patterns and then with each other. It, therefore, results that I am enabled to ob-

tain for each cast, a perfect reproduction of the pattern, although the sides of the flask may have expanded from their normal dimensions and shape.

The centering and adjusting steadying members shown in Fig. 6, are modifications of the construction shown in Figs. 1 to 4, in that instead of a ball *e*, I have provided a cone *r*, and instead of a semi-circular socket to fit the ball *e*, I have provided a conical socket in the arm *s* to fit the cone *r*. The adjusting steadying member in this figure comprises an arm *t'* carried by the cope *a* having a bearing pin *u* to engage in a slotted arm *v* fixed to the drag.

It is obvious that those skilled in the art may vary the details of construction and arrangement of parts without departing from the spirit of my invention, and therefore, I do not wish to be limited to the above disclosure except as may be required by the claims.

Having thus fully described the nature of my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A flask for casting metal bodies, comprising two separable flask parts and two sets of steadying members therefor, one set of steadying members providing for the correct centering of the flask parts to bring the parts of the mold cavity into exact correspondence, and the other set of steadying members providing for the adjustment of the flask parts during the centering thereof.

2. A flask for casting metal bodies, comprising two separable flask parts, a socket fixed to one of the flask parts and a ball fixed to the other flask part to engage in the socket for effecting an exact correspondence of the sections of the mold cavity, and means fixed to the flask parts coöperating with the ball and socket to hold the flask parts in their assembled relation.

3. A flask for casting metal bodies, comprising two separable flask parts, centering means connected to the flask parts permitting one of said parts to swing in a plane parallel to the other part and thus bring the sections of the mold cavity into exact correspondence, and means fixed to the flask parts coöperating with the centering means to maintain the flask parts in their assembled relation.

4. A flask for casting metal bodies, comprising two separable flask parts, means for centering the flask parts, and means permitting of the adjustment of the flask parts consisting of an arm provided with a bearing pin fixed to one of the flask parts, and a slotted arm fixed to the other flask part, to receive the bearing pin, and coöperating with the centering means to hold the flask parts in their centering relations.

5. A flask for casting metal bodies, comprising two separable flask parts, a socket

connected to one of the flask parts, and a ball connected to the other flask part to engage in the socket, whereby the flask parts can be accurately centered, a bifurcated arm
5 connected to one of the flask parts provided with a bearing pin and a slotted arm connected to the other flask part to enter into the forked end of the bifurcated arm and receive the bearing pin.

Port Hope, November 1st, 1911.

EDWARD PIPHER.

Signed in the presence of—

H. T. BUSH,

C. H. RICHES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."