2 Plates Plate 1

J. R. DAVIES.

Imp't in Molders Flasks.

117391

PATENTED JUL 25 1871

Fig 1

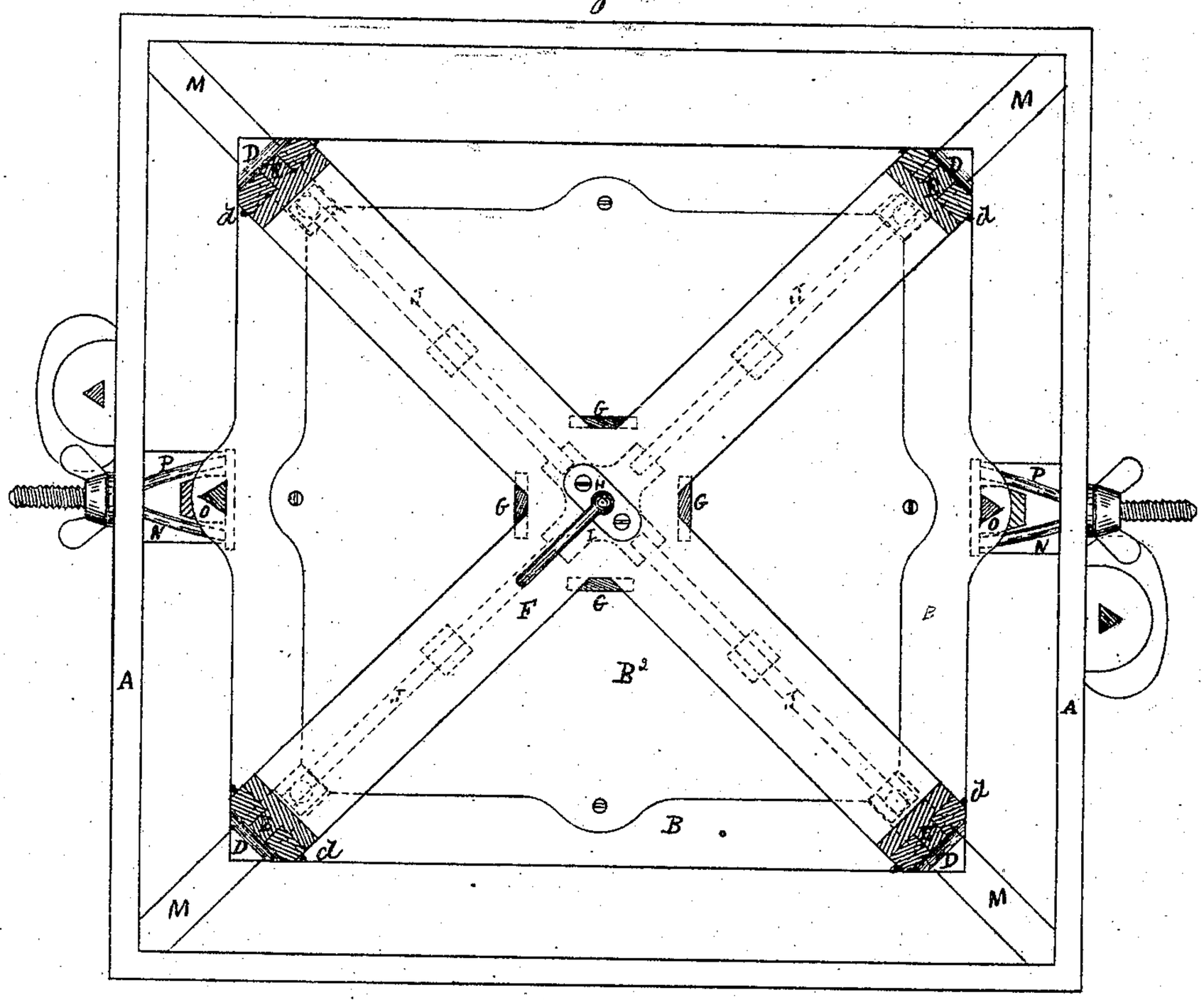
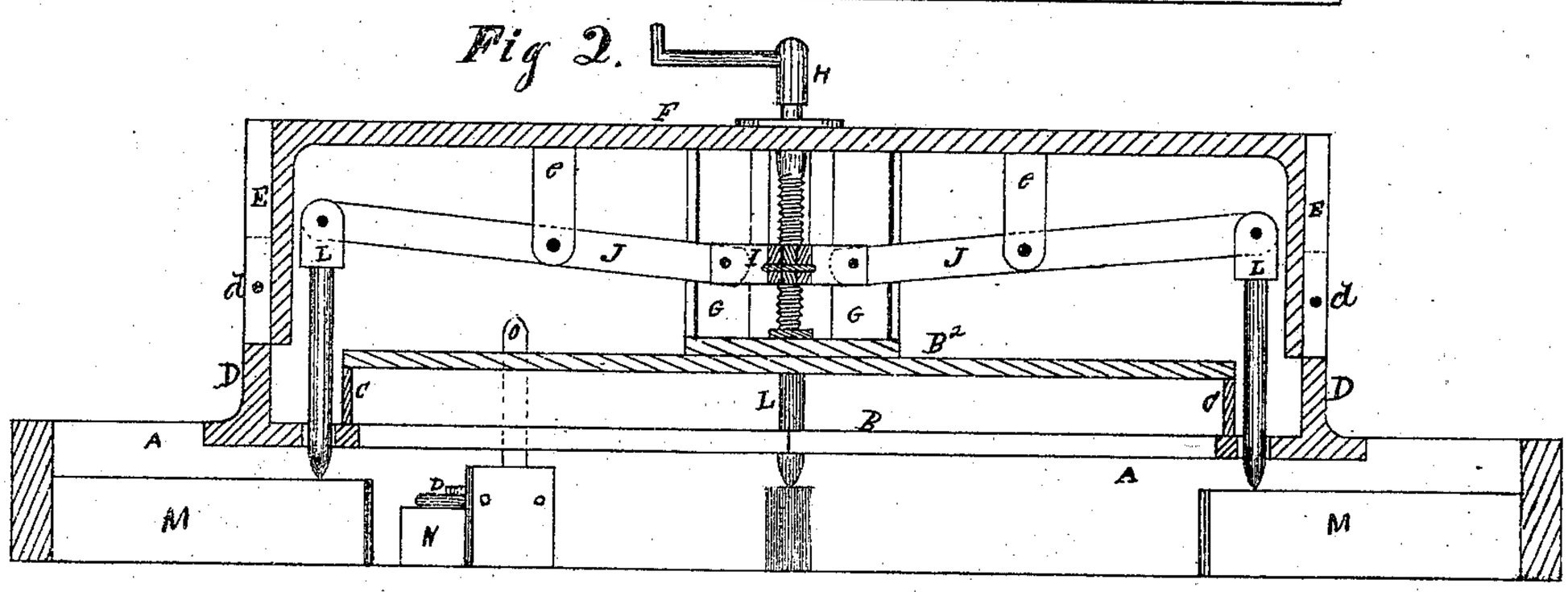


Fig 2.



Witnesses

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E. H. Sherburne

Inventor

John R. Davies

2 Plates Plate 2.

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Imp't in Molders Flasks.

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Fig 3.

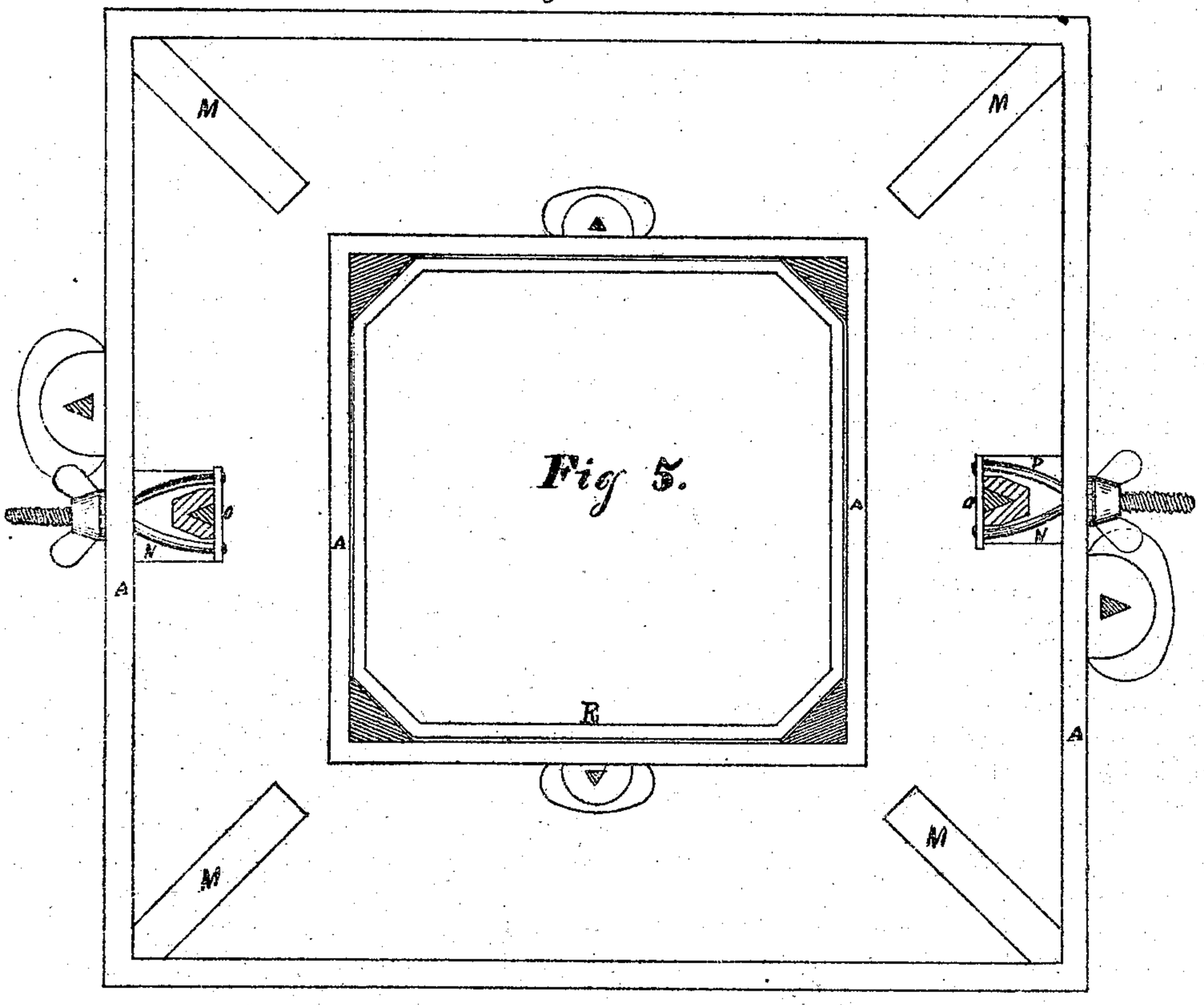
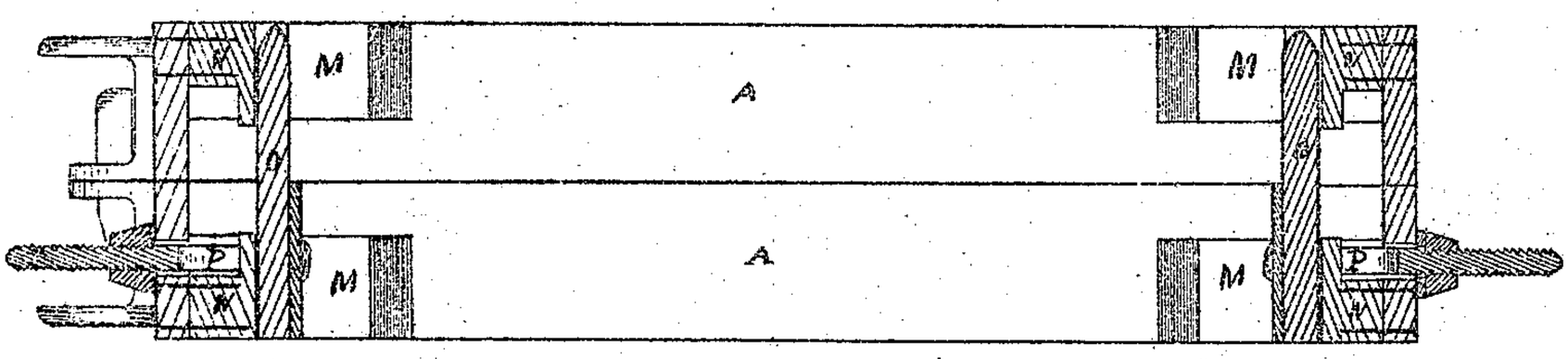


Fig 5.

Fig 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN R. DAVIES, OF RACINE, WISCONSIN.

IMPROVEMENT IN METHODS AND APPARATUS FOR MOLDING MATCH-PLATES.

Specification forming part of Letters Patent No. 117,391, dated July 25, 1871.

To all whom it may concern:

Be it known that I, JOHN R. DAVIES, of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Molders' Flasks; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1, plate 1, is a plan or top view of my invention as used when molding the permanent plate upon which the patterns are matched. Fig. 2, plate 1, is a vertical diagonal section of the same on line *x x*, showing the manner of drawing the patterns from the mold. Fig. 3, plate 2, is a top view of the navel or lower portion of the flask. Fig. 4, plate 2, is a vertical transverse section of the same with the cope or upper division attached, showing the manner of constructing the same into the ordinary flask; and Fig. 5, plate 2, is a plan of the ordinary flask with a portion of my improvement attached.

Similar letters of reference indicate corresponding parts in each of the several figures of the drawing.

My invention has for its object to improve the means for molding and casting by what are termed "match-plates;" and to this end it consists, in general terms, in the process for matching patterns for molding permanent match-plates, as will be hereinafter more fully described. My invention also consists in a modification of the invention patented to me the 10th day of March, A. D. 1863, in order to adapt it to my improved process.

In the drawing, A represents the flask, composed of two parts in the usual manner; B, the match-board; and C, a frame secured to said board, near its outer edges, and of sufficient depth to receive the pattern or patterns to be matched. B^2 is the cover, secured to the upper side of the frame C by means of screw-bolts or other devices that will admit of its ready removal. D D are posts or uprights affixed to the four corners of the match-board and provided with longitudinal slots to receive guides E, secured to the outer ends of the frame F. This frame F is formed of two strips of wood fastened together at right angles to each other, and extends diagonally across the match-board from post to post, to which it is attached by pins or keys *d*, as shown. G G are posts attached to the center of the frame F and extending downward nearly to the cover B^2. H is a vertical screw-threaded shaft, having its bearings in the center of the frame F, and carrying upon its lower end the cross-head I, so arranged as to move up and down by the rotation of said shaft. J are tilting-levers hinged to the outer ends of the cross-head and pivoted at or near their centers to supports *e* depending from the under side of the frame F. To the outer ends of these levers are jointed the pins L, which pass downward through openings in the corners of the match-board B and rest upon the lugs M secured to the corners of the flask A, as shown. The arrangement of these parts is such that, when the screw-shaft is rotated, the action of the levers raises the match-board to draw the pattern from the sand, as will be presently described. To the inner sides of the flask A, at or near the center longitudinally, are secured lugs N N, having vertical V-shaped grooves, which receive guide-pins O of a corresponding shape. These pins are held in position by means of clasps P, and extend upward through V-shaped openings cut in the match-board B outside the frame C, whereby said board is secured firmly in place during the tamping of the sand to form the mold. The clasps P extend outward through the sides of the flask, and are provided with suitable nuts and washers to admit of their easy adjustment, the object of which is to allow said pins O to be moved inward toward the center of the flasks by the contraction of the iron and thus retain a true position when the permanent match-plate is being cast. R, Fig. 5, represents a movable lining or inner flask, that is shaped approximating to the shape of the flask A, and so arranged as to be readily removed. The object of this arrangement is to retain the mold in position and allow the outer flask to be removed, thus saving great expense, as one skeleton flask will form any number of molds.

The operation of matching the pattern or pat-

terns preparatory to being molded is as follows: The match-board and frame C are placed upon a quantity of sand, either within the flask or other suitable receptacle, and the cover B^2 removed. The pattern is then placed within the frame C, extending below the same into the sand to the draught or parting-line. The space within the frame C, around the pattern and even with the lower face of the match-board, is now filled with prepared plaster of Paris or equivalent material, the cover B^2 replaced upon the frame, and the whole lifted off the sand and inverted. By this operation the match-board and its frame contain a pattern bedded to the parting-line in prepared plaster of Paris or equivalent.

It will be understood that the sand in this connection is used simply to support and protect the pattern while being molded in the plaster, and does not contain any portion of the mold which is used in the final casting.

The pattern is now drawn from the plaster, and a second match-board secured to the first in the manner usual in molding with the ordinary flask, being held in place by the guide-pins O′ entering the lower match-board. The cover B^2 of this second board is removed, and the entire space within the frame C, together with the mold in the lower match-board from which the pattern has just been drawn, filled with plaster of Paris. The cover is then replaced and the match-boards separated in the usual manner of parting the common flask. By this second operation the second match-board contains a perfect negative of the mold in the first match-board. The pattern is then secured in the mold first made and the match-boards are complete. I have now one match-board containing a negative corresponding to one part of the pattern, and another match-board in which the other projecting part of the pattern is formed by the pattern itself. These two boards I term the temporary plates, from which the molds in the sand are formed, preparatory to casting, in the following manner: The temporary match-plate containing the projecting pattern is inverted to bring such pattern uppermost, and the lower portion of the flask A laid upon and over it. The flask is then filled with sand which is properly tamped, and the whole turned upside down to bring the temporary plate uppermost. The plate, together with the pattern, is then drawn from the sand by the action of the shaft H and levers J, and thus one-half of the mold is obtained. The upper portion of the flask A is then placed upon and secured to the second temporary plate containing the plaster negative, and filled and tamped in like manner. The same are then turned up side down, the temporary plate drawn from the sand in the manner just described, and thus the second half of the mold is obtained. The two parts of the flask are then clamped together in the usual manner and the mold is ready for pouring. To prevent the sand from falling through the flask around the temporary plate I provide a board corresponding to the exterior size of the flask, upon which the latter rests. The center of this board is removed to permit the passage through it of the frame C of the temporary plate; and when the latter is inverted to support the flask the uncut portion of the board bears against the bottom of the flask and the match-plate B, completely filling the space between the inner sides of the flask and such match-plate.

It will be readily understood that the V-shaped pins O also serve as guides for drawing the temporary plates and patterns from the sand.

If the patterns are designed for constant use, I prefer, as more economical, to cast from the temporary plates what I denominate permanent plates, which are metal plates having the patterns cast on them. To accomplish this the temporary plates with their patterns are molded in the sand contained in the flasks, and drawn by the drawing device, as previously described for molding the patterns.

It will, of course, be understood that the plates, as well as their respective portions of the pattern, are to be molded and cast, instead of the pattern only, as when the temporary plates are employed.

In casting the permanent plates the V-shaped pins O in the flask form the guide-holes in one of such plates, and must be coated with oil or other suitable substance to prevent the molten metal from adhering to them. The V-shaped pins in the other plate are cast by fitting the pins O′ of the corresponding temporary plate, when such plate is molded, within the seat of the pins O, the latter being previously removed from the flask. When the metal is poured into the flasks in casting the permanent plates the nuts upon the clasps P are loosened and the clasps pushed inward to permit the pins O or O′ to be moved toward the center of the flask by the contraction of the casting.

Instead of casting two plates with part of a pattern on each, one plate may be cast with half a pattern on each side, so that one plate only would be needed for a full match; but I prefer to cast them in pairs, as described.

The lugs M in the corners of the flasks are so arranged that when the permanent plate is cast it extends between the two sets, and is therefore prevented from springing and warping while cooling.

My invention is of special advantage in molding small patterns, as a number may be molded at the same time.

Having thus described my invention, what I claim as new is—

1. The process herein described for matching patterns for molding permanent match-plates, consisting, essentially, of the following steps: first, one part of the pattern is molded in plaster and removed therefrom; secondly, a plaster cast of that mold or impression is taken, which forms a temporary match-plate for the said part of the pattern; thirdly, the pattern is

returned to the plaster mold, and with it forms the temporary match-plate for the other part of the pattern, from which temporary match-plates permanent match-plates may be molded, substantially as described.

2. The combination of the match-plate B, frame C, and removable cover B^2, substantially as described, for the purpose specified.

3. The pins O and clasps P, adapted for adjustment substantially as described, for the purpose specified.

4. The combination of the keys *d*, posts D, guides E, and frame F, substantially as described, for the purpose specified.

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Witnesses:

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E. A. ELLSWORTH.