

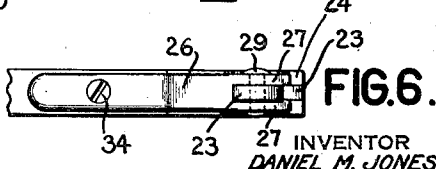
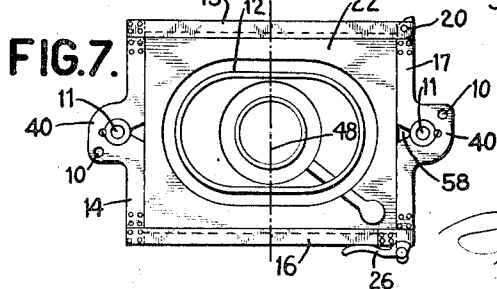
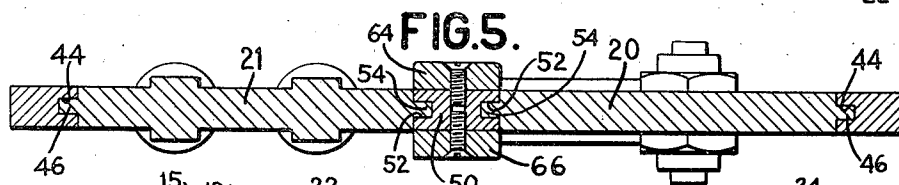
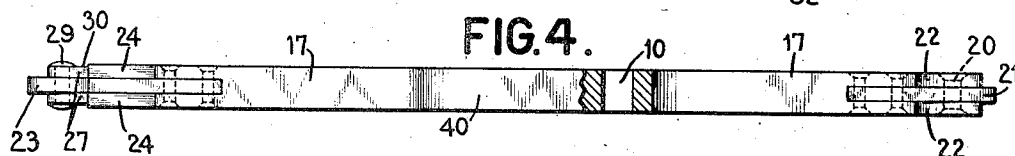
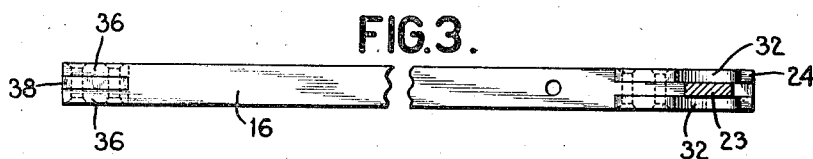
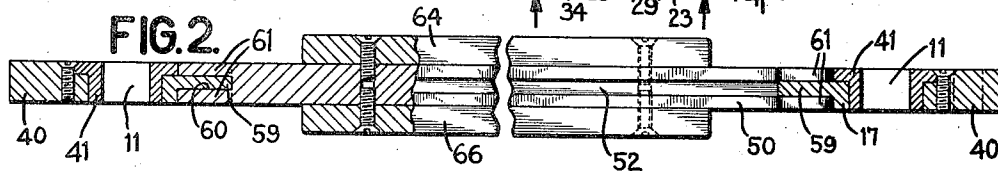
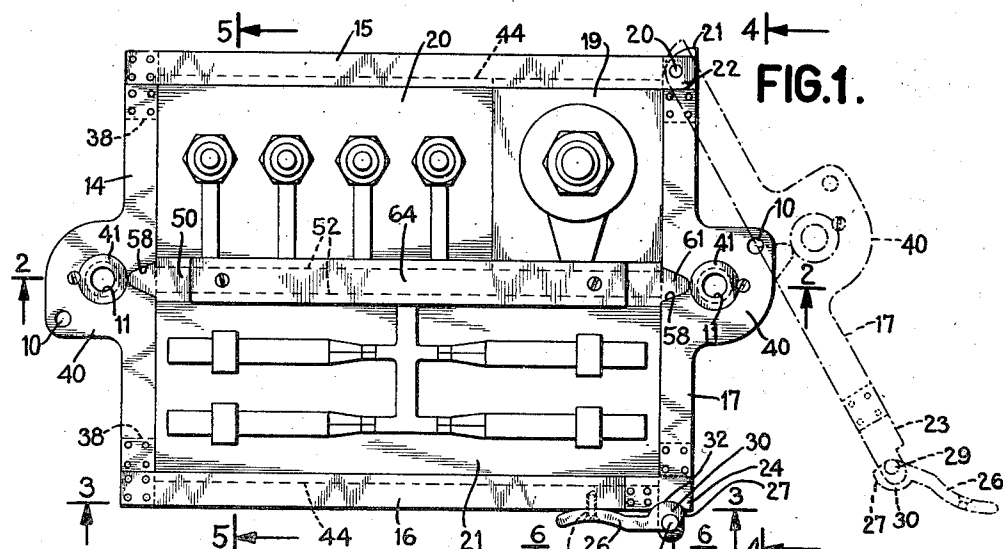
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MOLDING MACHINE

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MOLDING MACHINE

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9 Claims. (Cl. 22—157)

This invention relates broadly to improvements in molding machines adapted to compress sand about a pattern in the making of molds for castings, known as squeeze machines or "squeezers". More particularly, the invention relates to match plates for squeeze machines of the kind adapted to be disposed between the cope and drag of a flask and drilled with holes to match the holes and pins in the flask. The patterns are mounted on this board or plate, the part of the pattern that extends into the drag being on one side of the plate and the cope section of the pattern being on the other side of the plate. Such match boards or plates are usually of metal and are used where a plurality of the same or different small parts are to be cast in one operation. Heretofore, a match plate was integral and required that a predetermined number of the parts be cast at the same time. This is sometimes disadvantageous when, for instance, the match plate contains the patterns for two complementary members, such as an upper and a lower bracket forming a pair. If one of such pair is defective or spoiled in machining, a new pair must be cast, one of which is superfluous and wasted.

The present invention has, therefore, for an object a metal match plate, particularly adapted to squeeze machines, in which patterns are interchangeable or replaceable to adapt the same to a wide variety of uses. Accordingly, a frame is provided in which may be used removable and interchangeable match plate sections bearing the pattern sections.

Another object of the invention is a frame so constructed and arranged as to receive plates of varying sizes so relatively related as to permit patterns of different sizes on plate sections of proportionate area to be interchangeably used at one and the same time. To this end, a rectangular frame is adapted to receive a single plate section of the entire area of the interior of the frame when such is required, or two plate sections each half the area or, by the addition of a median frame member, multiples of the plate sections each of proportionally smaller area.

Still another object of the invention is removable or interchangeable match plate sections for reception in the common frame of this invention.

The invention also seeks a match plate which is practical from the standpoint of ease of manufacture and convenience and durability in use.

These and other objects of the invention and the means for their attainment will be more apparent from the following detailed description

taken in connection with the accompanying drawing illustrating various embodiments by which the invention may be realized, and in which:

Figure 1 is a view showing, in plan, the frame forming part of the match plate of this invention with metal plate sections therein of different sizes to show the applicability of the device to the molding of many different patterns at the same time;

Figure 2 is a sectional view taken in the plane indicated by the line 2—2 of Figure 1 and showing the removable median frame member in position for use with match plate sections representing half or less of the entire match plate area, and utilized also as a gate forming member;

Figure 3 is a view showing, in side elevation, that side frame member to which the free end of the displaceable end frame member is secured, looking at said side on the line 3—3 of Figure 1;

Figure 4 is a view showing, in side elevation, on line 4—4 of Figure 1, the end frame member which is displaceable to permit the insertion and removal of the replaceable match plate sections;

Figure 5 is a transverse sectional view, taken on the plane indicated by the line 5—5 of Figure 1;

Figure 6 is a fragmentary view taken on the line 6—6 of Figure 1 showing the latching means securing the displaceable end frame member in closed position; and

Figure 7 is a view similar to Figure 1, on a smaller scale, showing the application of the frame to the reception of one or more match plate sections extending from side frame member to side frame member, the median frame member being, in this case, removed.

A match plate for squeezer machines generally has the shape indicated by the outline of the combined plate sections and frame of Figure 7 and is an integral plane member formed with holes 10 and 11 to register with the holes and pins in the cope and drag sections of the flask and on the plane upper and/or lower surfaces of the match plate are formed or removably secured the pattern portions 12 to be molded.

In accordance with this invention, a frame 14—17 is adapted to removably receive interchangeable match plate sections 19—22 upon which pattern portions are carried.

The match plate frame, as illustrated, is rectangular and comprises a relatively stationary end frame member 14 rigidly joined at one end to a relatively stationary side frame member 15 and

rigidly joined at its other end to a relatively stationary side frame member 16.

To the free end of the side frame member 15 is pivoted, as at 20, a relatively movable or displaceable end frame member 17 formed with a tongue 21, at its pivoted end, received in the bifurcated end 22 of frame member 15 and carrying, at its free end, a tongue 23 adapted to be received in the bifurcated or slotted free end 24 of the side frame member 16, when the end member 17 is in closed position. The frame members 14, 15, 16 and 17 are rectangular in cross-section.

The end member 17 may be detachably secured in closed position by any convenient latching devices. As shown, the tongue 23 carries, at its end, a bifurcated latching lever 26, the arms 27 of which embrace and are pivotally secured to the tongue 23 as by rivet 29. At least one of the arms 27 of this lever 10 carries a latching detent 30 illustrated as a cam like surface engaged, when the lever is in locking position, in a recess 32 formed in the outer surface of at least one of the ends 24 of side frame member 16. If desired, the latch 26 may be held in locking position, say, by a screw or other detachable securing means indicated at 34 in Figure 1.

The frame members 14—17 and latching lever 26 are conveniently composed of some light metal, such as aluminum or composition, and one or all of the corners may be reenforced with a plate of some stronger material, such as steel. Thus, while the bifurcated ends 36 of the side frame members may be integral with the said members, the tongues 38 may, if desired, be formed of some stronger metal, such as bronze or steel inserted in the end frame member 14 and/or 17. If preferred, the side frame members 15, 16 may be of steel or other harder metal or alloy as may also, of course, the end frame members. The proper metals or alloys will be selected for wear and strength.

The end frame members 14 and 17 are formed or otherwise provided with extensions 40 provided with bushings 41 defining the holes 11 and drilled with holes 10, which holes are adapted to register with the holes and pins in the cope and drag sections of the flask, as will be understood.

The side frame members are formed with longitudinally extending slots 44 adapted to receive tongues 46 on the side edges of replaceable match plate sections such, for instance, as are illustrated in Figures 1 and 7 at 19, 20, 21 and 22. Such tongue and groove connections, of course, are only one of many interlocking means adaptable for this purpose. In Figure 7, a single match plate section is shown occupying the entire space within the frame because the pattern 12 is of a size to require it. If, however, somewhat smaller patterns are to be molded, two match plate sections of equal area defined by the dot and dash line 48 may be inserted, side by side in the frame, at the same time. Obviously, smaller or proportionately different sized match plate sections following the same principle may be included in the frame. Thus each plate section may carry one or more different patterns, as desired.

Where a number of different small patterns are to be molded at one and the same time, smaller and variously shaped match plate sections may be utilized, as shown in Figure 1. Thus, if six different patterns are to be molded, match plate sections such as the section 19 may be used, if desired. In this event, a median frame member 50 can be used. It is desirably composed of brass or other relatively strong metal or alloy.

The median frame member 50 is grooved on opposite sides, as at 52, to receive the tongues 54 on opposite edges of match plate sections such as 19, 20 and/or 21. The match plate sections are also provided with tongues 46 for reception in the grooves 44 of the side frame member 15, 16. On the median line of the frame, each end frame member, on its inner side is notched in its upper and lower surfaces as at 58 to define a tongue 59 therebetween. Each end of the median frame member 50 is bifurcated by a horizontal slot 60 and tapered, as at 61. The median frame member 50 is retained in position by engaging the tongues 59 on the frame members in the slots 60 of the median member, the tapered ends 61 of the median member positioning the latter against displacement by being received in the recesses 58.

Where a plurality of small molds are to be used and the castings made in one operation, a common gate is provided for all the match plate sections. The median frame member conveniently serves to form the gate. Thus it may carry either integral therewith or removably secured thereto a gate forming member 64 on its upper surface. If the pattern is such that it must be gated in the drag also, a similar gate forming member 66 may be secured beneath the median member.

The shape of the several match plate sections illustrated in the drawing are given by way of example only to show the wide variety of shapes and sizes possible to meet particular conditions. Suffice it to say that when the displaceable end 17 is unlatched and opened and the desired match plate sections slipped into place by sliding the sections inwardly from the open end with the tongues on the sections in the grooves in the frame and the frame again closed, that a combined composite match plate is formed which can be used in the customary manner in squeezer machines.

Various modifications will occur to those skilled in the art in the composition, configuration and disposition of the component elements going to make up the invention as a whole, as well as in the selection and use of the requisite parts for the purpose at hand and in the substitution of elements accomplishing equivalent results and no limitation is intended by the phraseology of the foregoing description or illustrations in the accompanying drawing.

What is claimed is:—

1. In a match plate for squeeze machines, in combination, a rectangular frame comprising two side frame members and one end frame member fixedly secured together, an end frame member pivotally secured at one end to the free end of a side frame member, means having one element carried by the pivotally secured end member and a coating element on the other side frame member to detachably secure the outer end of the pivoted end frame member to the free end of the other side frame member, means to reenforce the corners of the frame, a removable median frame member extending parallel to the two side frame members, means to removably secure the respective ends of said median frame member to the respective end members, the inner faces of at least one pair of opposed frame members being grooved, the side faces of said median frame member being grooved, at least one match plate section and at least one tongue formed on opposed edges of a match plate section for reception in the grooves.

2. In a match plate for squeeze machines, in combination, a rectangular frame comprising two side frame members and one end frame member fixedly secured together, an end frame member pivotally secured at one end to the free end of a side frame member, means to detachably secure the outer end of the pivoted end frame member to the free end of the other side frame member, a median frame member extending parallel to the two side frame members, means to removably secure the respective ends of said median frame member to the respective end members, the inner faces of at least one pair of opposed frame members being grooved, the side faces of said median frame members being grooved, at least one match plate section and at least one tongue formed on opposed edges of a match plate section for reception in the grooves.

3. A founding device comprising a frame having two apertures, each having a single open side; a plurality of match plates having a tongue and slot connection with the walls of said apertures and adapted to be placed therein from the open side of the apertures; a pivotally mounted cross bar on the frame adapted to be moved into a position to close both of the open sides; and means to lock said bar in the closed position, and to thereby maintain the match plates in a locked operative position relative to the frame.

4. A founding device comprising a three-sided main frame having a single opening for accommodating a single row of one or more interchangeable large size match plates; a dividing bar shaped for connection to the main frame and when so connected dividing said single opening into a plurality of openings, each having a single open side, for locating and supporting a plurality of rows of interchangeable small size match plates.

5. A founding device comprising a three-sided main frame having a single opening therein which is adapted to locate and support a single row of one or more interchangeable large size match plates; a combination dividing bar and main gate adapted to divide said single opening into a plurality of openings for locating and supporting a plurality of rows of interchangeable small size match plates, so that extension gates on the small plates match with the main gate.

6. A founding device comprising a three-sided main frame forming a single aperture for receiving and the walls of which support a single row of one or more interchangeable large size

match plates; means for dividing said single aperture main frame to form a double three-sided aperture for receiving and the walls of which support a double row of one or more interchangeable small size match plates; and a cross bar forming a fourth wall for both of said three-sided apertures and adapted to hold said match plates in place.

7. A founding device comprising a three-sided main frame forming a single aperture for receiving and the walls of which support a single row of one or more interchangeable large size match plates; means for dividing said single aperture main frame to form a double three-sided aperture for receiving and the walls of which support a double row of one or more interchangeable small size match plates; a cross bar forming a fourth wall for both of said three-sided apertures and adapted to hold said match plates in place; and means for locking said cross bar in its match plate holding position.

8. A founding device, comprising a three-sided main frame having a single opening for accommodating a single row of one or more interchangeable large size match plates; a dividing bar shaped for connection to the main frame and when so connected dividing said single opening into a plurality of three-sided apertures for locating and supporting a plurality of rows of interchangeable small size match plates; a cross bar having a pivotal connection with said frame and adapted to swing into a position across the open sides of said double three-sided aperture and thereby form two four-sided apertures; and a tongue and slot connection between said dividing bar and cross bar for supporting the dividing bar against vertical movement and locating and supporting it laterally with respect to the main frame.

9. A founding device, comprising a frame having two apertures, each of which has an open side, and separated by a dividing bar; a plurality of match plates having a tongue and slot connection with the walls of said apertures; a cross bar adapted to be moved into a position to close both of the open sides of the frame; means to lock said bar in frame-closing position; and a tongue and slot connection between said dividing bar and the cross bar for supporting the dividing bar against vertical movement and for locating and supporting it laterally with respect to the frame.

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