Feb. 26, 1935. H. P. L. LAUSSUCQ 1,992,314

PRESS

Filed Nov. 30, 1931 5 Sheets-Sheet 1

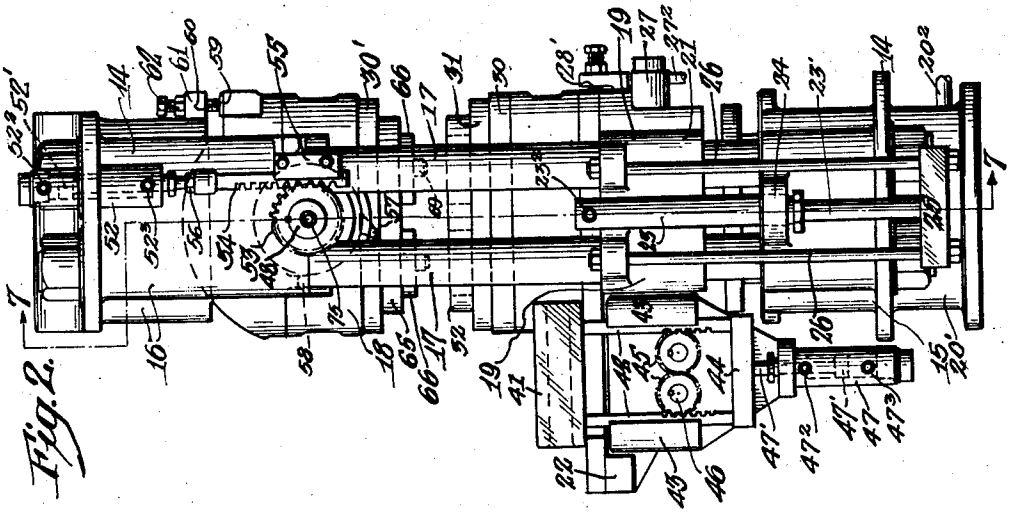

Fig. 2.

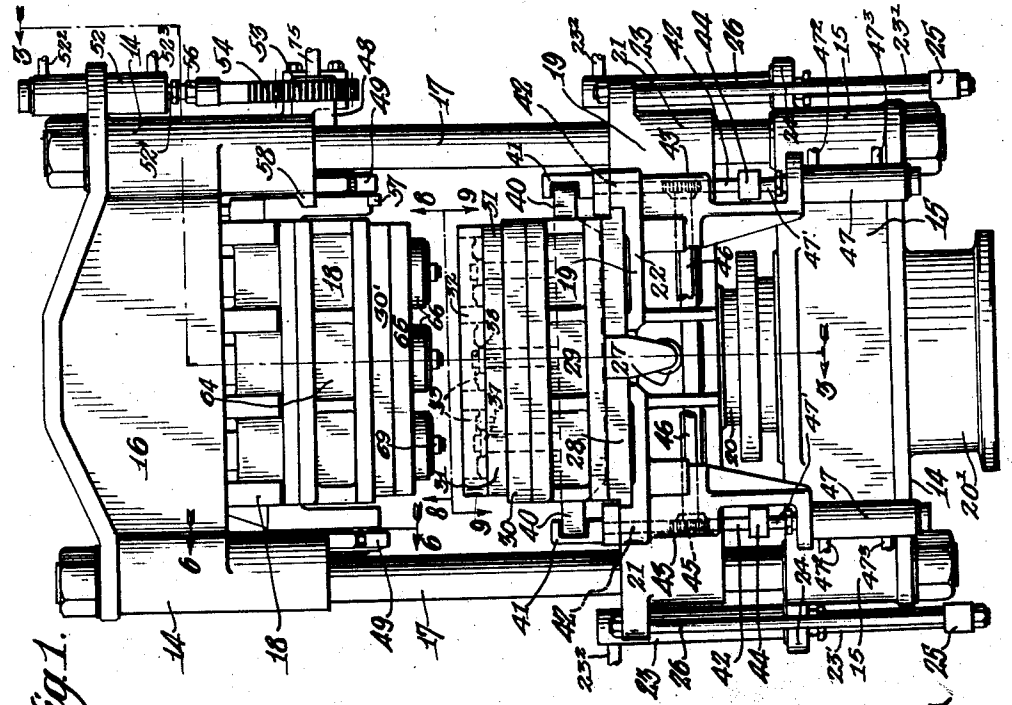

Fig. 1.

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Feb. 26, 1935. H. P. L. LAUSSUCQ 1,992,314

PRESS

Filed Nov. 30, 1931 5 Sheets-Sheet 2

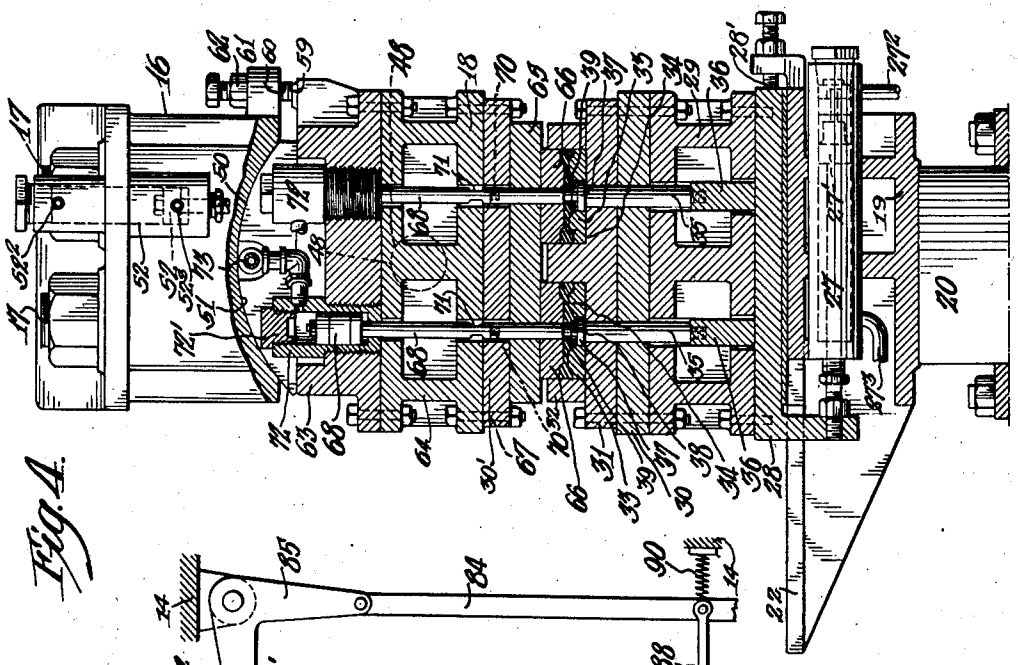

Fig. 4.

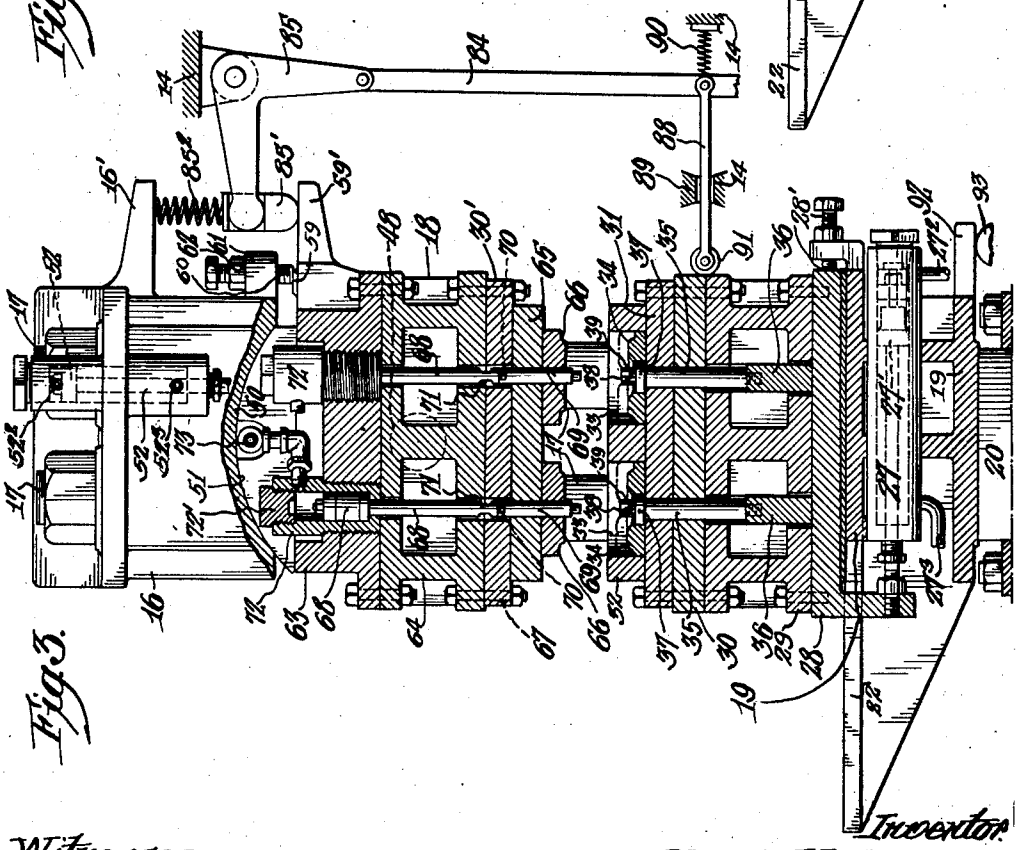

Fig. 3.

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Feb. 26, 1935. H. P. L. LAUSSUCQ 1,992,314

PRESS

Filed Nov. 30, 1931 5 Sheets-Sheet 3

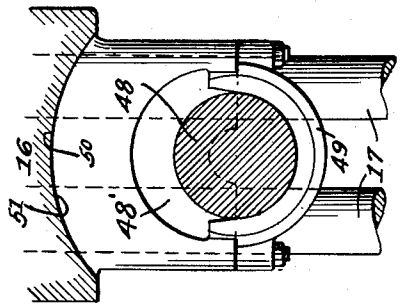

Fig. 6.

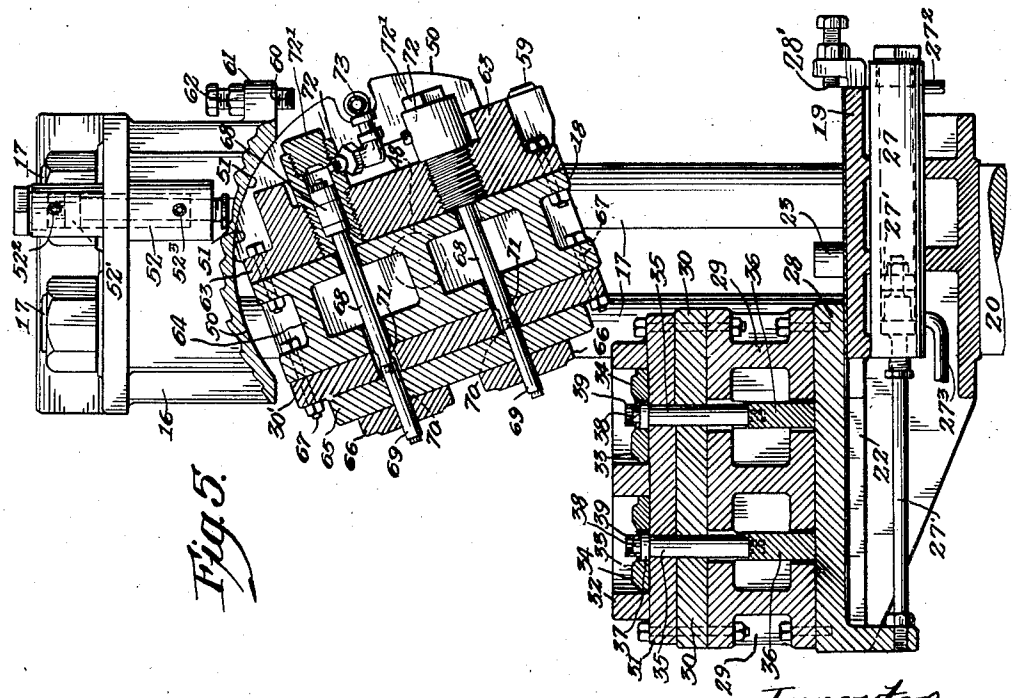

Fig. 5.

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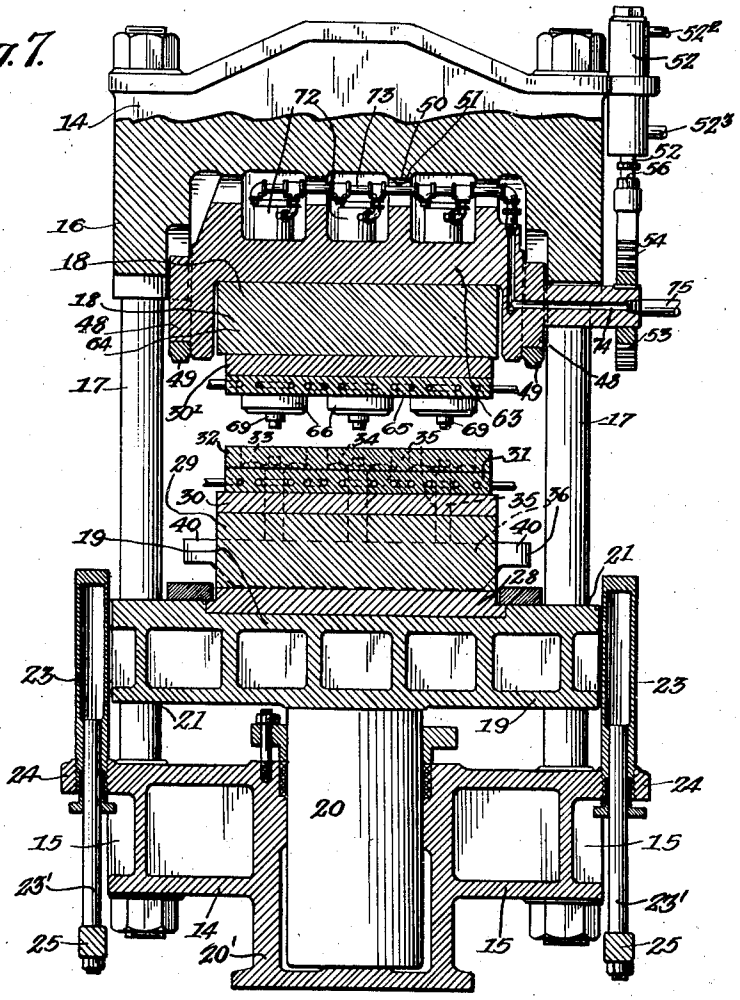
Feb. 26, 1935. H. P. L. LAUSSUCQ 1,992,314

PRESS

Filed Nov. 30, 1931 5 Sheets-Sheet 4

Fig. 7.



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Feb. 26, 1935. H. P. L. LAUSSUCQ 1,992,314

PRESS

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Fig. 10.

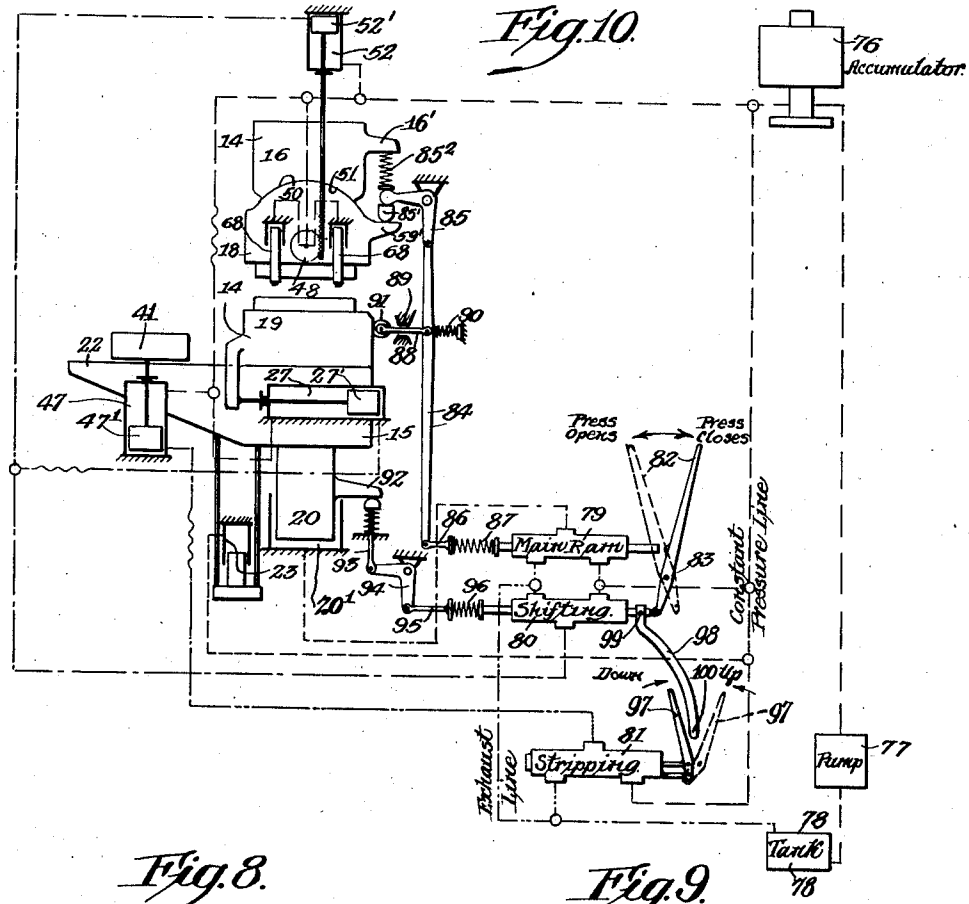


Fig. 8.

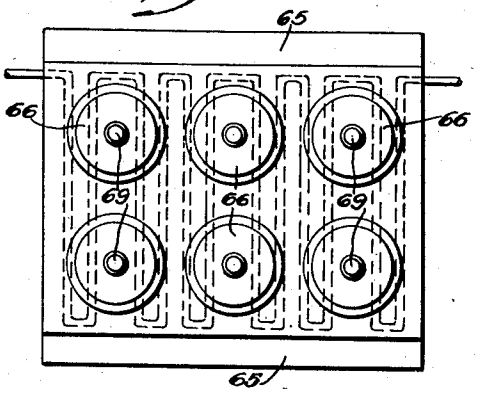
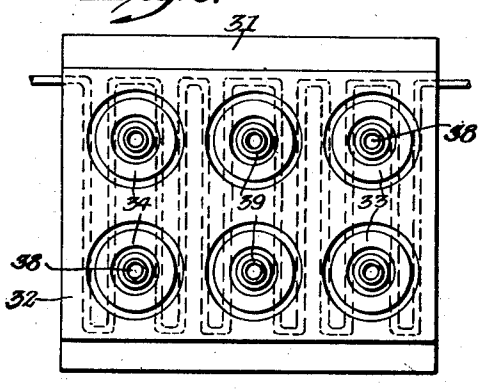


Fig. 9.



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Patented Feb. 26, 1935 1,992,314

UNITED STATES PATENT OFFICE

1,992,314

PRESS

Henri P. L. Laussucq, Reading, Pa., assignor to Birdsboro Steel Foundry and Machine Company, Birdsboro, Pa., a corporation of Pennsylvania

Application November 30, 1931, Serial No. 577,932

11 Claims. (Cl. 18—17)

My invention relates to a press for molding plastic materials, and more particularly to that type of press having upper and lower dies respectively shiftable angularly about a horizontal axis and laterally for easy access to the dies, normally the lower die being movable upwardly and downwardly to and from the upper die.

A purpose of the invention is to provide mechanism of the character indicated adapted to easy and inexpensive manufacture and well suited to the needs of service.

A further purpose is to use the downward retraction of the lower and movable die to determine a lateral shifting of the lower die after it reaches a low position, and for easy discharge of the finished pieces and recharging of fresh molding material for the next pressing operation.

A further purpose is to make the vertical retraction of the movable die from pressing engagement with the upper die determine the shifting movements of both dies, normally an upward and outward turning of the upper die and a laterally outward sliding of the lower die.

A further purpose is to provide the dies of a press of the character indicated with cooperating and simultaneously acting shift mechanism capable of shifting both dies at the same period in the pressing cycle.

A further purpose is to provide the shiftable dies of a press of the character indicated with hydraulic means urging and resiliently locking the dies individually into their respective positions for registry one with the other, and acting during the relative approach of the dies.

A further purpose is to use hydraulic rams inside an angularly shiftable die of the character indicated to clamp the molding inserts to place preparatory and during the pressure molding operation.

A further purpose is to introduce along the axis of a horizontally turnable die of a press of the character indicated, hydraulic pressure to the cylinders of rams for individually clamping the inserts, such as hubs, into the individual molds of the press preparatory and during the pressure molding operation.

A further purpose is to make the return of both upper and lower shiftable dies into operating alinement determine the operation of the main cylinder of the press.

A further purpose is to provide mechanism making it impossible to operate the main ram to bring the press members together unless the members are in their proper alinement.

A further purpose is to provide stripper bars with equalizers for securing uniformity of rectilinear movements among the different stripper rods controlled by the bars.

A further purpose is to positively retract stripper bars and to advance them and retract them hydraulically.

A further purpose is to support an angularly shiftable upper die of a press of the character indicated by stationary top structure vertically above the die as distinguished from supporting it at the shaft upon which the die is adapted to turn.

Further purposes will appear in the specification and in the claims.

I have elected to illustrate one form only of my invention, selecting a form however that is practical and efficient in operation and which well illustrates the principles involved.

Figure 1 is a front elevation of a press embodying a desirable form of my invention, omitting pressure connections.

Figure 2 is a right side elevation of Figure 1.

Figure 3 is an enlarged vertical section taken upon the line 3—3 of Figure 1.

Figure 4 is a view corresponding to Figure 3 but with the parts in different positions, the upper and lower dies, which are vertically alined in both figures, being separated and the lower molds being charged with molding material in Figure 3, the dies being pressed together in Figure 4 for molding a charge.

Figure 5 is a view corresponding to Figure 3, but with the dies in different positions, they being open for cleaning and charging in Figure 5.

Figure 6 is a detail section taken upon the line 6—6 of Figure 1.

Figure 7 is a section taken upon the line 7—7 of Figure 2.

Figures 8 and 9 are fragmentary top and bottom plan views of details, being views upon the lines 8—8 and 9—9 respectively of Figure 1.

Figure 10 is a diagrammatic view illustrating pressure connections and a desirable layout for easy automatic operation and relation of the different parts of the press.

Like numerals refer to like parts in all figures.

Describing in illustration and not in limitation and referring to the drawings:—

In the illustrated press, stationary supporting structure 14 comprises a base 15, a top 16 and intermediate tension and supporting posts 17, the upper and lower platens 18 and 19 being respectively supported by the top 16 and the main ram 20.

The base 15 forms a cylinder 20′ for the main ram 20 of the press, having fluid connection at 20^2, and the lower surface of the bottom platen 19 presents a downwardly directed pad to the upper end of the ram.

The lower platen 19 is limited to vertical movement, has guiding connections at 21 about the posts 17 and is provided with a forward extension 22 for receiving and supporting the lower mold when this is moved into its open or shifted position.

The bottom platen 19, thus adapted to be lifted by the main ram 20, is provided with hydraulic pull-back mechanism. As illustrated, this includes downwardly directed vertical cylinders 23, having fluid connection at 23^2, threaded into suitable extensions 24 from the stationary base at opposite sides of the press. The pull-back rams 23' extend downwardly from the vertical cylinders to cross blocks 25, the opposite ends of the blocks being rigidly connected by rods 26 to the vertically movable bottom platen 19.

The bottom platen forms a slideway for the lower mold structure, which is adapted to be moved from one limiting position shown in Figure 2, at which it is directly under and in alinement with the retracted upper mold, to the laterally shifted position shown in Figure 5, the lower mold being positioned at one end or the other of its slideway by a cylinder 27, containing a double acting ram 27' and having fluid connection at 27^2 and 27^3.

The laterally shiftable lower mold structure is shown as including a working slide 28, an adjustable stop 28', a stand 29, a filler block 30, a steam plate 31 and a composite die 32, the composite die forming at 33 the lower portions of individual molds, each of which is shown with an individual mold bottom 34 to provide the lower contour of the molded pieces.

Movable portions of the lower mold structure include stripper pins 35 and stripper bars 36 for operating the stripper pins.

The stand 29 may comprise I-beam members transversely across the slide, with the horizontal stripper bars 36 between adjacent I-beams. The stripper bars 36 support and preferably are rigidly connected to the stripper pins 35, which are located at the individual molds wherever they may be needed.

The stripper pins 35 may be supplied by the customer to suit the individual molds. Their heads are shown as flanges 37 with upward extensions 38 to seat hub inserts 39 of the molded piece, each insert 39 forming a permanent portion of the molded product and commonly being knurled or roughened to provide a strong hold with the molded material.

At the lower ends, the stripper pins may thread into the upwardly presented sides of the stripper bars. As illustrated the filler block, steam plate, composite die, stripper pins and stripper bars are removable from the stand as a unit, being normally bolted to the stand, which is in turn bolted to the slide.

The stripper bars are normally located on the center line of the individual molds, with heads of the stripper pins seating the hub inserts of the molds and the pins themselves adapted to be lifted and dropped by the stripper bars, suitably as a unit with the bars.

The filler block 30 and a corresponding block 30' of the upper mold structure are intended to act merely as filler pieces to permit easy variation in the lengths of the stroke of the press by changing filler pieces to others of suitably different thicknesses. The shorter the requisite stroke of the press, the thicker should be the filler block.

It will be understood that when the dies are shallow, the strokes of the press should be made relatively short in order to avoid the additional time needed for the longer strokes.

If the molded product is such that the full stroke of the press is required to make the molded piece, the filler blocks may be omitted altogether.

The stripper bars extend laterally beyond the sides of the stand, the opposite projecting ends 40 of the stripper bars entering the inwardly directed horizontal channel recesses of channel members 41.

The channel members 41 extend along opposite sides of the lower platen for vertically lifting and dropping the strippers, the channel members, which are vertically movable on the platen being in continuous vertical interlocking relation with the ends of the stripper bars when the lower die is in its shifted position as shown in Figure 5.

As best seen in Figures 1 and 2, the channels 41 are rigidly carried upon the upper ends of vertical rack rods 42 which are movable in vertical guides 43, are cross connected at the bottom at 44 and mesh with equalizer gears 45 rigidly mounted on shafts 46, the bearing supports of the shafts 46 as well as the guides 43 being rigid portions of the lower platen extension 22.

Stripper cylinders 47, having fluid connections at 47^2 and 47^3, operate double acting stripper rams 47', which vertically lift and lower the channels 41, the upper ends of the rams being suitably connected to the cross connections 44 and the ram cylinders being rigidly supported on bracket portions of the lower platen extension 22.

The channel members are thus shown rigidly connected to the stripper rams 47' upon opposite sides of the press and suitably the equalizing gears upon one side are rigidly connected to those upon the other side of the press in order to provide more uniform and even movements of the stripper pins. An even and simultaneous motion to all the stripper pins in many cases may be essential for accurate molding, especially if the molded parts are all of rectangular, of triangular or of other non-circular sections.

From Figure 2 it is seen that the ends of the stripper bars 40 engage the channels 41 only when the lower mold is laterally withdrawn from beneath the upper mold.

While only one stripper pin is shown for each individual mold it will be understood that whether or not one, or more than one, stripper pin is needed for each individual mold is determined by the character of the molded material and the dimensions of the molded products, which determine whether or not the stripping strains on the product will be such as to cause possible damage to the product.

The angularly shiftable head carrying the upper die is pivotally suspended upon shaft extensions 48 which rest in pillow block bearings 49 at opposite sides of the stationary top structure 16 of the press, the heavy upward force of the press during molding however being carried, not upon the shift extensions and their bearings, but upon upwardly and downwardly directed arcuate bearing surfaces 50 and 51 respectively of the die and of the top structure that arcuately fit together vertically above the lower die in pressing position.

The upper die is angularly positioned by means of a rack and pinion device. A hydraulic cylinder 52, containing a double acting ram 52', having fluid connections at 52^2 and 52^3, operates a rack 54 engaging a pinion 53 on the extended end of one of the shafts 48. The rack 54 is vertically guided at 55 and longitudinally adjustably connected at its upper end at 56 to the ram 52', the cylinder of the ram being rigidly connected to the top structure of the press.

The arcuate bearing surfaces 50 and 51 between the angularly shiftable die and stationary top structure are preferably machined to make a

close fitting engagement when the die is in its registering position as shown in Figure 2.

To insure this, the bearings 49 preferably make a vertically loose fit with the shaft extensions 48, as indicated in Figure 6 and 48'.

The two extreme angular positions of the upper die are determined by stops upon the die and stationary structure respectively, stops 57 and 58 determining the outer or shifted position of the upper die and stops 59 and 60 determining the press registering position of the upper die.

Since the position of the upper die determined by the engagement of the stops 59 and 60 must be in an exact registry with that of the vertically movable die of the press, one of the stops 59 and 60 is preferably made adjustable. As illustrated, the stationary stop 60 comprises a screw adjustably threaded through the stationary lug 61 of the top structure and presents its lower end to engagement with the stop projection 59 on the upper die, the screw being locked in any set position by a suitable lock nut 62.

When the upper die is in the registering position, the hydraulic ram 52' is normally exerting a strong upward pull on the rack 54, and is therefore pulling the upper die upward against the stop 60 and the bearing surface 51, thereby securing firm supporting engagement at the bearing surfaces 50 and 51 before the lower mold has been closed by the hydraulic press.

The suitably small vertical play at the bearing 49, the presence of the mating bearing surfaces 50 and 51 above the head, with the alinement of the pull of the vertical rack and pinion along a line horizontally intermediate the stop 60 and the bearing surface 51, result in a firm supporting engagement at the bearing surfaces 50 and 51 and an entire elimination of stresses upon the shaft extensions 48 whenever the head is in its registering position, irrespective of the position of the lower die. This is an important feature of my invention.

The relatively rigid portions of the angularly shiftable head may suitably include a main casting 63, the shaft extensions 48, a stand 64, a filler plate 30', a steam plate 65, and individual mold tops 66 to register with the mating mold bottoms of the lower die.

The mold tops, hot plate and filler block are suitably removable as a unit from the stand by removing bolts 67.

A particularly desirable feature of the invention includes means for hydraulically registering and clamping the insert hubs in their proper positions before the pressure engagement between the upper and lower dies.

As illustrated, individual downwardly directed rams 68 preferably under constant hydraulic pressure at their upper ends have removable clamping rods 69 on their lower ends to be changed to accommodate the inserts 39 which may vary widely according to the customer's requirements.

Frequently the inserts 39 are metal hubs externally knurled or otherwise roughened to provide firm hold with the bakelite or other plastic material molded and for this reason the illustrated inserts 39 are shown as hubs, the indication however being intended for a conventional one for any insert.

The hub inserts fit upon the top portions of the stripper pins of the lower mold and are adapted to be engaged by the lower ends of the clamping rods 69 which are fastened removably upon the lower ends of the rams 68. They are shown threaded into the lower ends of the rams at 70, the rams 68 being non-circular at 71 for more easy holding when threading the clamping rods on or off the rams.

The cylinders 72 of the rams 68 are threaded into the casting 63 and closed by suitable plugs 72'. Hydraulic connections are provided from a pipe 73 which connects by suitable branch pipes into the upper ends of the different cylinders and is itself connected to a source of preferably constant pressure by a passage 74 through the axis of the shaft 48 and a swinging or flexible connection at 75.

It will be seen that the ends of the clamping rods 69 are strongly pressed downwardly, normally resting upon the bottoms of the cylinders. The rams and their extension clamping rods 69 will usually be all of the same length, so that the ends of the clamping rods will register the same distance from the face of the mold, being suitably above the lower mold before the upward advance of the lower die.

Diagrammatic connections of a preferred layout are shown in Figure 10, some of the press parts shown diagrammatically in this figure being altogether omitted in the showing of the press proper since the omitted structure, clearly indicated in Figure 10, may be widely varied to give the intended result.

Figure 10 shows conventionally an accumulator 76, a pump 77, and a suction tank 78 interconnected by piping shown in dotted lines with a main ram valve 79, a shifting valve 80, and a stripping valve 81.

The bottom molds are charged with molding material the press members are open, as in the position of Figure 5, the operating handle 82 being at this time in the position shown in dot (Figure 10), so that the main ram valve 79 is thrown to the left and the main cylinder 20' is connected to exhaust, while the shifting valve is to the right, and pressure is applied to the upper end of the shifting cylinder 52 and to the right hand end of the shifting cylinder 27 (Figure 5), against the opposing constant pressure on the smaller ends of these cylinders.

After the molds have been charged with the molding material, the handle 82 is moved to the right out of its dot-and-dash position to the full line position.

This lever or handle 82 is pivoted at 83 and the movement of its handle end to the right moves its other end to the left, which moves the die shifting valve 80 to the left without affecting the position of the valve 79. Thus the main cylinders 20' are still connected to exhaust.

The shifting of the valve 80 to the left effects a release of the pressure of the large ends of the shift rams 27' and 52' which allows the constant pressure at the other ends of these rams to retract the rams and thereby retract the lower and upper dies respectively to their registering positions at which they are in vertical alinement.

The decrease in cylinder area at the ends having the piston rods is sufficient so that, when accumulator pressure is applied to both ends of one of the cylinders 27 or 52, the piston rods will tend to move out of the cylinders, and the pressure on the ends remote from the piston rods must be released in order to move the pistons in the opposite direction.

As the dies are reaching their registering positions, a floating lever 84 (Figures 4 and 10) is shifted to introduce pressure into the main cylinder.

The floating lever 84 has pivot connections at its upper and lower ends respectively to a downwardly extending arm of a bell crank 85 and to a horizontal link 86 that has a resilient connection 87 with the operating spindle of the main ram valve 79.

A horizontal arm of the rocker 85 is in position to be engaged and upwardly deflected by the upper die, as this die, retracting angularly on the shaft extensions 48, moves into its registering position, the resilient movement of the rocker shifting the top of the floating lever 84 to the left. The end of the bell crank 85 carries a follower 85' pressed by a spring 85^2 from a projection 16' against a dog 59' extending from the stop 59.

The floating lever has pivotal connection at an intermediate point with the outer end of a generally horizontal link 88 which is horizontally guided at 89, is spring pressed at 90 to the left and presents a roller 91 upon its inner end to engage the vertical side of the lower platen when the latter is in its registering position, the roller 91 rolling along the vertical side of the lower platen, suitably in a groove, when the lower platen is moved upward by the main ram.

It will be seen that if both upper and lower dies move into their registering positions, there is a positive angular movement of the floating rocker about its pivot connection with the link 88, positively shifting the link 86 operating the main ram valve 79.

It will also be seen that unless both the upper and lower dies are in their registering positions, an engagement by either of the dies with the floating mechanism, without a cooperating engagement by the other, cannot exert shifting force upon the lower end of the floating lever to operate the spindle of the valve 79.

When both molds are in their registering positions, the link 88 serves as a fulcrum about which the floating lever moves angularly to accommodate the movement of the bell crank rocker 85 by reason of the upper die returning to its registering position, the movement of the rocker then being effective to correspondingly move the lower end of the lever to shift the valve 79 through the spring 87.

The shifting of the spindle of the valve to the right turns the hydraulic pressure into the main cylinder, resulting in an upward movement of the lower die.

The lower ends of the top clamping rods 69 project somewhat below the lower die and engage the hub inserts before the engagement between the dies. After forming of the article in the mold, the clamping rods 69 are pressed by the rams away from the upper die, thus ejecting the molded object from the upper die.

As the lower die continues to move upwardly after this clamping engagement between the clamping rods and the inserts, the clamping rods are forced upward against the constant pressure upon the upper ends of the rams 68. The dies then press together upon the intermediate molding material, the press load thus applied to the plastic material being maintained for any desired time.

When the pressure molding is completed, the opening of the molds can be either manually controlled or controlled through a time relay, this control being effected by shifting the lever 82 to the left from the full line position of Figure 10 to the dot-and-dash position thereof.

This shifting of the lever 82 to the left causes the spindle of the valve 79 to shift to the left and releases the pressure under the main ram, the shifting valve 80 at this time remaining in the position to which it was moved when the lever was previously shifted to the right, that shown in full lines, Figure 10.

The valve 80 remains in any position to which it may be shifted in that the spindle is balanced to remain wherever set.

Moving the spindle of the valve 79 to the left releases the pressure under the main ram and the constant pressure in the pull backs 23, assisted by the dead weight of the moving platen, bring the platen downward.

As the lower die retracts downwardly and nearly reaches its downwardmost position, an arm 92 engages an upwardly presented link 93 that connects through a bell crank 94, link 95 and spring coupling 96 to the shifting valve 80, moving the valve 80 to the right and thereby introducing the accumulator pressure into the annular ends of the shifting cylinders 52 and 27, causing the upper die to turn angularly about the horizontal shafts 48 and the lower die to move outwardly, the two dies coming to rest in their respective open positions.

After the lower mold reaches its open position, that of Figure 5, an operator shifts the stripping handle 97 of the stripping valve 81 from the full line position to the dot-and-dash position to effect the stripping operation, the movement of the valve introducing accumulator pressure to the large ends of the stripper rams 47'.

In order to prevent pressure application to the stripping rams 47' when the dies are not fully shifted, that is, when the ends 40 of the stripping bars 36 are not fully engaged in the channel members 41, I secure a stop 98 upon the spindle of the shifting valve 80, as for example by the pin 99. Thus in the exhaust position of the shifting valve 80 the end 100 of the stop 98 prevents opening of the stripping control valve 81, and thus prevents moving the control lever 97 of the stripping valve 81 when the ends of the stripping bars 40 are out of engagement with the channel member.

After the stripping operation is complete, the handle 97 is returned to the left, the full line position of Figure 10, causing the strippers to return to their normal position by releasing pressure on the large ends of the stripper rams 47', the finished molded pieces being suitably removed while the strippers are raised.

The upper and lower molds are now inspected and cleaned if cleaning be needed, the lower mold is then recharged after which the cycle may be repeated.

It will be evident that, at the period in the pressing cycle when the dies are separated, I make the pressing surfaces of both dies accessible for performing necessary or desirable steps in the cycle. For example, during this period of accessibility of the die surfaces, I eject or strip the molded products from the molds, remove the stripped products from the die surface, either manually or mechanically, recharge the mold with material to be pressed and wipe off the mold surfaces, removing adhering fragments of pressed material if this be necessary.

All of these operations are ones which can best be performed when the dies are out of registry. The lower die preferably remains horizontal at all times, as this is the only position in which it may satisfactorily be filled for the next pressing cycle. Since, however, the upper die is inherently inaccessible as long as its pressing sur-

face faces downwardly, I rotate it so that its surface aproaches the vertical, in which position it may conveniently be inspected and cleaned.

By my invention I eliminate the necessity of performing filling, ejecting, cleaning and inspecting operations upon the dies in registering position. This has always been difficult, as it involves moving separate pieces of mechanism into and out of the space between the dies or else providing the mold with interior ports and valves which are a frequent source of trouble.

By my automatic control, I am assured that the pressing operation cannot start unless the dies are in complete registry. No additional effort on the part of the operator is necessary since the press starts automatically as soon as the dies return to their mating position.

One of the hazards in all pressing and similar operations is the necessity that the operator reach into the space between the dies to insert the product to be pressed or to remove the finished article. By my invention, however, this necessity is entirely avoided, since the operator need touch the mold only when the dies are out of registry.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of my invention without copying the structure shown, and I, therefore, claim all such in so far as they fall within the reasonable spirit and scope of my invention.

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

1. A molding press including upper and lower dies, the lower die being movable upwardly and downwardly to and from the upper die and rams on the upper die alined with the lower die and adapted to clamp mold inserts preparatory to and during the pressure molding operation.

2. A molding press including upper and lower dies respectively shiftable angularly about a horizontal axis and laterally for easy access to the dies, the lower die being movable upwardly and downwardly to and from the upper die and being adapted to receive mold inserts within the lower die, rams on the upper die alined with the lower die and adapted to clamp the mold inserts to place in the molds preparatory to and during the pressure molding operation, cylinders for the rams supported by the upper die and pressure connections to the cylinders entering the upper die along the axis of the angular shifting of the upper die.

3. A molding press including upper and lower dies, the lower die being movable upwardly and downwardly to and from the upper die, stripper pins and rams respectively on the lower and upper dies and in cooperative alinement with one another, mold insert seats on the pins and cooperating insert clamps on the lower ends of the rams for clamping the mold inserts to place in the molds preparatory to and during the pressure molding operation.

4. A molding press including upper and lower dies respectively shiftable angularly about a horizontal axis and laterally for easy access to the dies, the lower die being movable upwardly and downwardly to and from the upper die, stripper pins and rams respectively on the lower and upper dies and in cooperative alinement with one another, mold insert seats on the pins and cooperating insert clamps on the lower ends of the rams for clamping the mold inserts to place in the molds preparatory to and during the pressure molding operation.

5. A molding press including upper and lower dies, the lower die having an upwardly presented mold portion shiftable laterally for easy access and being movable when under the upper die upwardly and downwardly to and from the upper die, stripper mechanism including stripper pins on the said mold portion, horizontal stripper bars supporting the pins and having extended ends fitting in vertically movable operating mechanism receiving the extended ends of the bars, rams for moving the mechanisms up and down, and rack and pinion equalizer connections for maintaining the rams together and the mechanisms continuously horizontal and each in phase with the other.

6. In a molding press, relatively movable dies having cooperating parts of a mold upon their faces, means for pressing the dies together and for separating them, bearings pivotally supporting one die about an axis at right angles to the direction of relative movement of the dies, there being freedom of movement of said pivoted die in the bearings away from the other die when pressure is applied between the dies, and an arcuate supporting face engaging an arcuate surface of the pivoted die and receiving the pressure of the other die against the pivoted die to hold that die free from support by the bearings when the dies are under pressure.

7. In a molding press, relatively movable upper and lower dies, means for applying pressure between the dies, horizontal pivotal support for the upper die yielding upwardly away from the lower die and a seat engaged by and supporting the upper die when pressure is applied between the dies.

8. In a molding press, relatively movable upper and lower dies, means for applying pressure between the dies, a seat for one die, horizontal pivotal support for that die yielding away from the other die against the seat and hydraulic means for rotating the pivoted die about its pivot when the dies are separated.

9. In a molding press, relatively movable upper and lower dies having cooperating surfaces forming a mold, a stripper carried by one of the dies capable of extending into the mold space, means for shifting the dies relatively to a position out of registry, means for actuating the stripper when the dies are separated and an interlocking connection between the means for actuating the stripper and the means for relatively shifting the dies whereby stripper actuation is prevented during application of pressure to the dies.

10. In a molding press, relatively movable upper and lower dies, walls forming a depression in one of the dies adapted to receive an insert which becomes a permanent part of a molded article, and a hydraulic ram on the other die engaging the insert and holding it in the depression when pressure is applied between the dies.

11. The method of forming a composite article comprising an insert and a resinous material in permanent relation to the insert, which consists in surrounding the insert in a mold with powdered resinous material, in moving the mold walls relatively closer together, bringing pressure upon the resinous material and permanently forming it around the insert and in concurrently resiliently urging the insert from one wall of the mold against an opposite wall of the mold, thereby preventing shifting of the position of the insert as the pressure within the mold increases.

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