

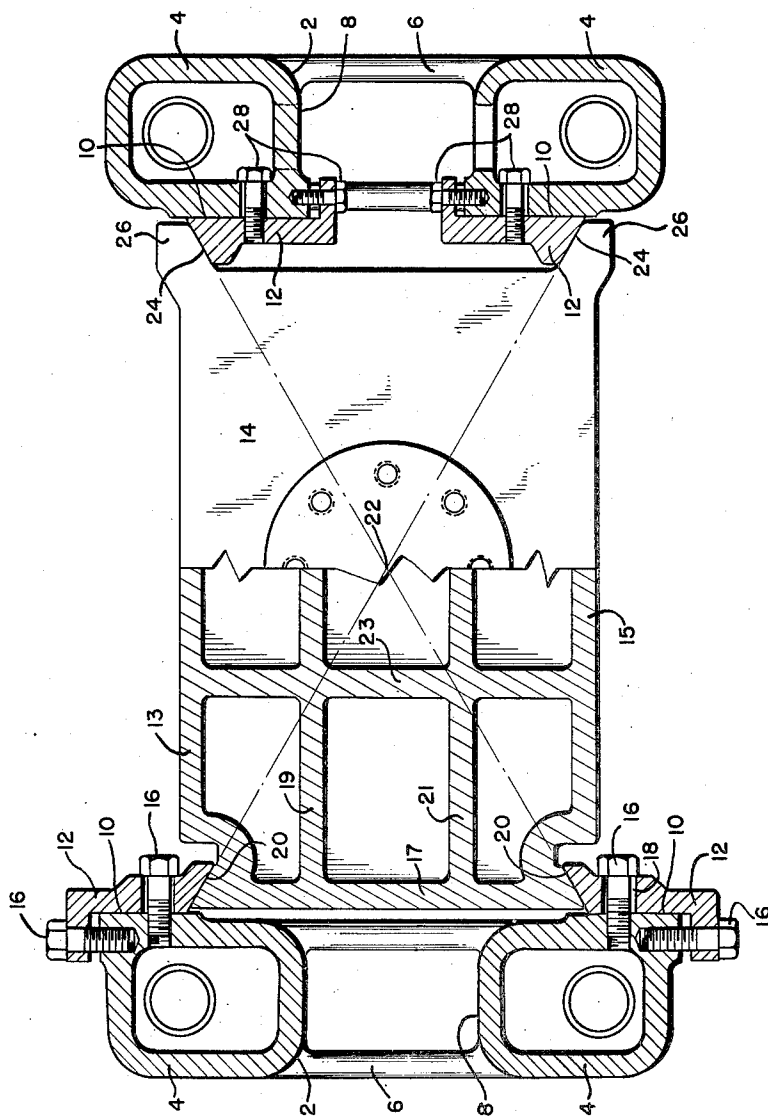
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GUIDING MEANS FOR HEATED PRESS PLATEN

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GUIDING MEANS FOR HEATED PRESS  
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My invention relates to hot process presses and is concerned particularly with such presses in which a movable element, sometimes designated a slide or platen, having a die face is subjected to usage under conditions which result in relatively wide temperature variations and therefore are accompanied by expansion and contraction of the moving parts.

The general object of my invention is to devise support means for such a slidable die or platen as may be adjusted while cold and which will retain the adjustment regardless of such expansion or contraction as might take place in the moving platen under working conditions.

A more specific object of my invention is to devise a hot working press having a platen support or housing, a platen confined therein, and interengaging guide means on the platen and the housing or support so constructed and arranged as to accommodate expansion and contraction of said platen under operating conditions while maintaining the die face of the platen accurately positioned with respect to a mating die or mold.

A further specific object of my invention is to design a hot working press wherein spaced supports may confine therebetween a movable die or platen, said supports having adjustable gibs or guides for confinement of said platen under conditions which will accurately position the die face on said platen irrespective of expansion and contraction of said platen under changing temperature conditions during operation. My invention contemplates an arrangement such as that described wherein the engaging guide surfaces on the platen supports and on the platen itself are formed in planes radial with respect to the center of the ram or moving platen, a construction which will admit of expansion and contraction of the moving ram while maintaining its die face accurately positioned with respect to a mating die or mold.

With the increased demand for extremely accurate guiding or molding press slides, ordinary adjustments are not satisfactory for more than a small range of temperature with ordinary gib guides such as heretofore have been known in slide presses. Gib guides have heretofore been used but have not been satisfactory under extreme conditions. The ordinary type of press utilizes an open rod construction with the bronze bushings in the slide for engagement with the rods. When such rod guides are used, the usual solution to this problem is to make the bushings relatively loose when the press is cold so that they will fit reasonably well when the press is hot. In

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any event, however, such an adjustment is only a compromise and under most conditions of operation the bushings will bear on very limited surfaces of the rods, sometimes in almost a line contact.

It is well understood, of course, that some sort of guide means must be used where a movable die or press is utilized in forging a product or in forming a plastic member. As far as I am aware, my invention is the first satisfactory solution of the above-described problem. When a movable platen is constructed and arranged in accordance with my invention, a satisfactory adjustment may be made before the press is put in operation and while the parts are cold, and this adjustment will remain entirely satisfactory throughout the temperature range of its operation.

In the drawing, Figure 1 illustrates a portion of a molding press incorporating my invention, the view being taken as a horizontal section through the housing and slide, one half of the slide being shown in top plan view.

Describing the structure in detail, the press housing comprises the upright members 2, 2 at opposite sides thereof, each of said members comprising a vertical leg 4 at each edge thereof, each of said legs being illustrated as of box section and said legs being joined by horizontal reinforcing members 6, 6, leaving therebetween what may be defined as a window opening 8. On coplanar faces of opposite legs may be formed flat surfaces as at 10, 10 affording convenient areas for mounting gibs or guides 12, 12, which may suitably position the slide or platen 14 confined therebetween, said platen having the side walls 13 and 15, the end wall 17, the longitudinal ribs 19 and 21, and the transverse web 23. In the arrangement at the left of Figure 1, I have shown the gibs 12, 12 mounted at the remote edges of the legs 4, 4 and secured thereto as by machine bolts 16, 16, the bolt on the in-board face of each leg 4 being afforded some clearance as noticeable at 18 in order to afford satisfactory lateral adjustment of the gib 12. Each gib 12 has guiding engagement as at 20 along a plane surface with a similar surface adjacent one corner of the platen or die 14, each guide face being defined by a vertical plane and the faces at the alternate opposite edges of the platen lying in a single plane. The two planes thus defined intersect in a line at the center of the platen at 22.

The gibs 12 at the left of the figure are arranged to engage guide faces on the remote sur-

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faces of the platen at one end thereof. In the arrangement at the right of the figure I have shown the guides or gibs 12, 12 similarly adjustably mounted and so positioned as to engage adjacent surfaces 24, 24 formed on the projecting legs 26 at each corner of the platen. Although the arrangements shown at the right and left will both operate satisfactorily and are within the scope of my invention, that shown at the right is preferred under conditions in which substantial lateral thrust may occur. This is because any such lateral thrust will be transferred into the vertical housing members 4, 4 in large measure without placing heavy stresses on the threaded studs or machine bolts 28, 28 which act as securing means therefor. It also possesses the advantage that the securing bolts for the gibs may be positioned inboard the housing on the adjacent faces of the upright members 4, 4, thus leaving the exposed faces of the machine clean and unobstructed and presenting less safety hazard.

It will be readily understood by those skilled in the art that the angular arrangement of the guide faces on the gibs and the abutting faces on the slide will depend upon the dimensions of the slide itself. If a cross section of the slide or die is substantially a square, the angles would be approximately 45° if the guides were placed at the corners. Other ratios of width to depth would require angles to be varied accordingly but in each case a substantially satisfactory operating guide surface will be provided if the surfaces are defined by two vertical planes intersecting a line approximately at the center of the platen. By the arrangement I have shown, the guiding gibs may be adjusted when the machine is cold and they will remain in adjustment throughout the working period. The principle involved here is that by arranging the gib or guide surface radially with respect to the center of the ram or die, the average expansion will be along radial lines and consequently the guiding surfaces will slide across the gib faces with no change in the clearance regardless of expansion and contraction. Although I have illustrated my invention as applied to a vertical press, it is readily applicable to a horizontal press. Likewise, although I have shown the guide surfaces adjacent the respective corners of the die, it will be readily understood that such guide surfaces might be remote from the corners thereof provided they are constructed and arranged as herein specified.

It will be understood that I do not wish to be limited by the exact embodiment of the device shown which is merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a press, a housing including spaced members defining a platen opening, a platen between said members, means to guide said platen for reciprocative movement along said members, consisting of a pair of guide engaging surfaces on each end of the platen, and a pair of guide faces on each of said members in complementary flat face engagement with a pair of said guide engaging surfaces, said guide engaging surfaces and faces being disposed in diagonal planes intersecting in a line centrally of said platen, whereby expansion and contraction of said platen resulting from changes of temperature takes

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place substantially along said planes defining said faces and surfaces.

2. In a press, a housing including spaced members defining a platen opening, a platen between said members, means to guide said platen for reciprocative movement along said members, consisting of a pair of guide engaging surfaces on each end of the platen, and a pair of gibs on each of said members and having faces in complementary flat face engagement with a pair of said guide engaging surfaces, said guide engaging surfaces and faces being disposed in diagonal planes intersecting in a line centrally of said platen, whereby expansion and contraction of said platen resulting from changes of temperature takes place substantially along said planes defining said faces and surfaces.

3. In a press, a housing including spaced members defining a platen opening, a platen between said members, means to guide said platen for reciprocative movement along said members, consisting of a pair of guide engaging surfaces on each end of the platen, and a pair of gibs on each of said members and having faces in complementary flat face engagement with a pair of said guide engaging surfaces, said guide engaging surfaces and faces being disposed in diagonal planes intersecting in a line centrally of said platen, whereby expansion and contraction of said platen resulting from changes of temperature takes place substantially along said planes defining said faces and surfaces, and means to vary the spacing between each pair of gibs.

4. In a press, a housing including spaced members defining a platen opening, a platen between said members, means to guide said platen for reciprocative movement along said members, consisting of a pair of guide engaging surfaces on each end of the platen, and a pair of guide faces on each of said members in complementary flat face engagement with a pair of said guide engaging surfaces, said guide engaging surfaces and faces being disposed in diagonal planes intersecting in a line centrally of said platen, whereby expansion and contraction of said platen resulting from changes of temperature takes place substantially along said planes defining said faces and surfaces, a pair of said guide faces being disposed between a pair of said guide engaging surfaces.

5. In a press, a housing including spaced members defining a platen opening, a platen between said members, means to guide said platen for reciprocative movement along said members, consisting of a pair of guide engaging surfaces on each end of the platen, and a pair of guide faces on each of said members in complementary flat face engagement with a pair of said guide engaging surfaces, said guide engaging surfaces and faces being disposed in diagonal planes intersecting in a line centrally of said platen, whereby expansion and contraction of said platen resulting from changes of temperature takes place substantially along said planes defining said faces and surfaces, a pair of said guide engaging surfaces being disposed between a pair of said guide faces.

6. In a press, a housing including spaced members defining a platen opening, a platen between said members, means to guide said platen for reciprocative movement along said members, consisting of a pair of guide engaging surfaces on each end of the platen, and a pair of gibs on each of said members and having faces in complemen-

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tary flat face engagement with a pair of said guide engaging surfaces, said guide engaging surfaces and faces being disposed in diagonal planes intersecting in a line centrally of said platen, whereby expansion and contraction of said platen resulting from changes of temperature takes place substantially along said planes defining said faces and surfaces, each pair of gibs being disposed between its related pair of guide engaging surfaces.

7. In a press, a housing including spaced members defining a platen opening, a platen between said members, means to guide said platen for reciprocative movement along said members, consisting of a pair of guide engaging surfaces on each end of the platen, and a pair of gibs on each of said members and having faces in complementary flat face engagement with a pair of said guide engaging surfaces, said guide engaging surfaces and faces being disposed in diagonal planes intersecting in a line centrally of said platen, whereby expansion and contraction of said platen resulting from changes of temperature takes place substantially along said planes defining said faces and surfaces, each pair of guide engaging surfaces being disposed between its related pair of gibs.

8. In a press, a housing including spaced mem-

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bers defining a platen opening, a platen between said members, means to guide said platen for reciprocative movement along said members, consisting of a pair of guide engaging surfaces on each end of the platen, and a pair of guide faces on each of said members in engagement with a pair of said guide engaging surfaces, said guide engaging surfaces and guide faces being disposed in abutting engagement along diagonal planes intersecting in a line centrally of said platen whereby expansion and contraction of said platen resulting from changes of temperature takes place substantially along said planes whereby no adjustment of said guide means is required to compensate for said expansion and contraction.

ROBERT K. SEDGWICK.

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