Sept. 4, 1945. W. ERNST 2,384,160

PRESS STRUCTURE

Filed March 7, 1942 3 Sheets-Sheet 1

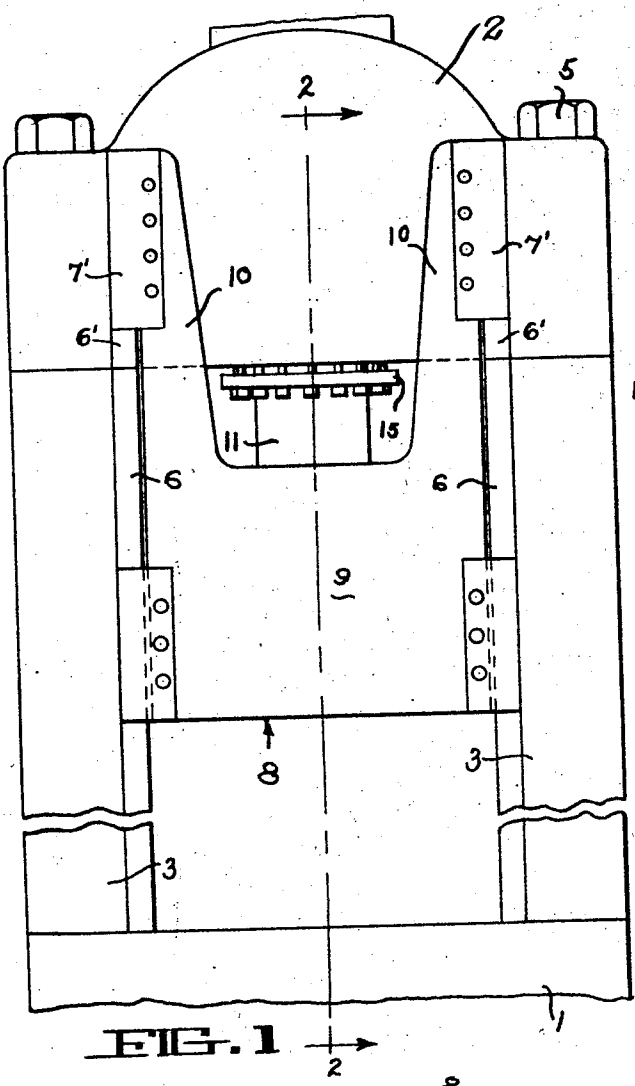


FIG. 1

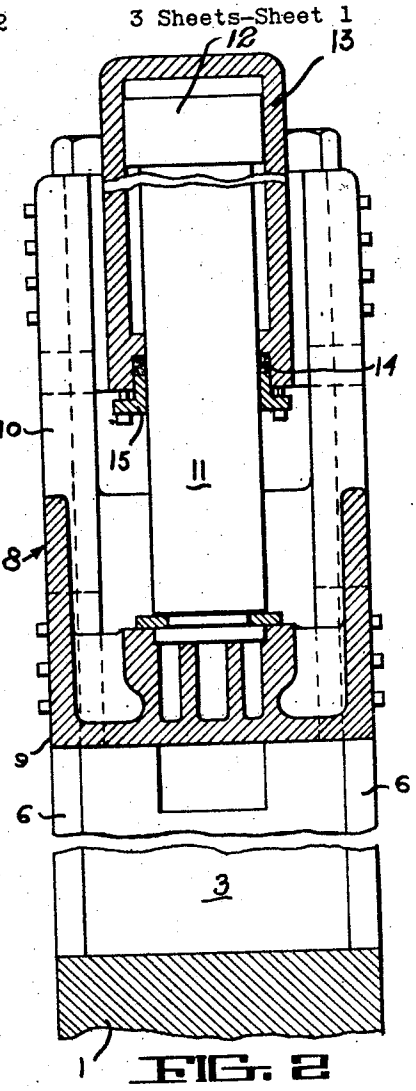


FIG. 2

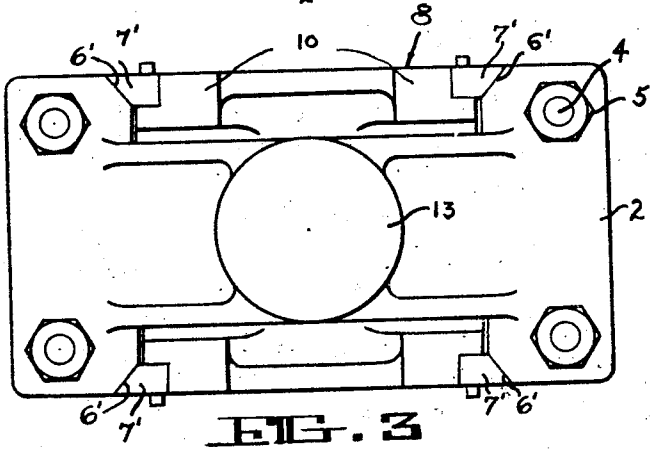


FIG. 3

INVENTOR
WALTER ERNST
BY
Toulmin & Toulmin
ATTORNEY

Sept. 4, 1945. W. ERNST 2,384,160

PRESS STRUCTURE

Filed March 7, 1942 3 Sheets-Sheet 2

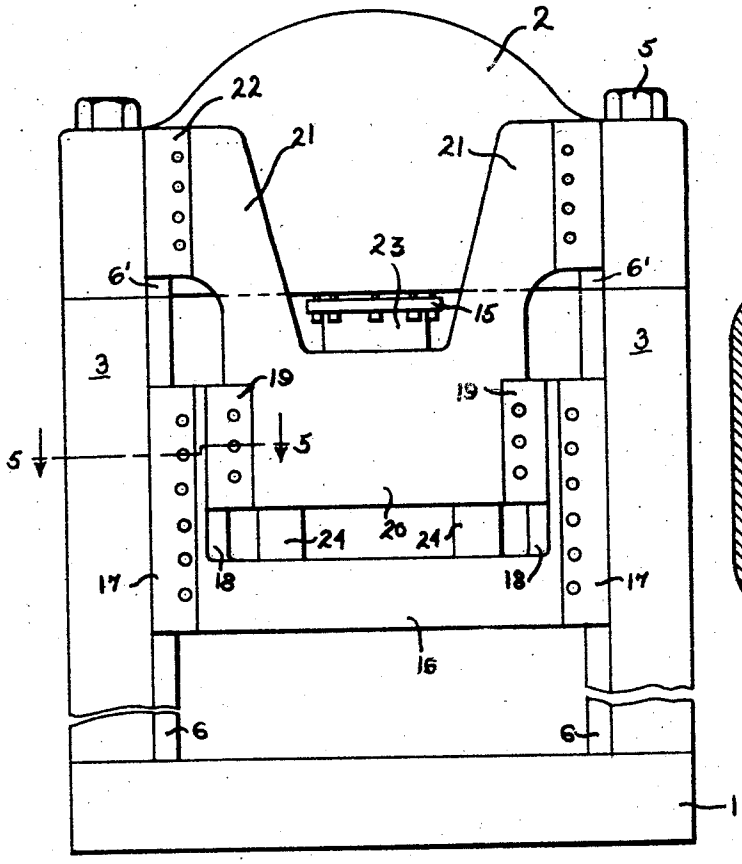
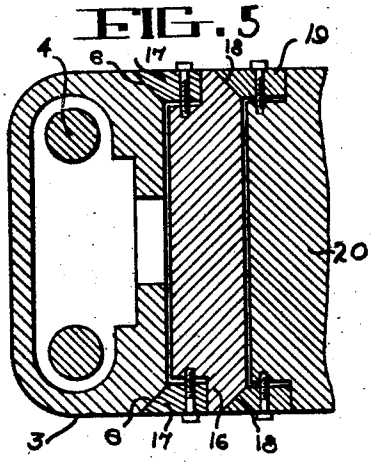


FIG. 4

FIG. 5



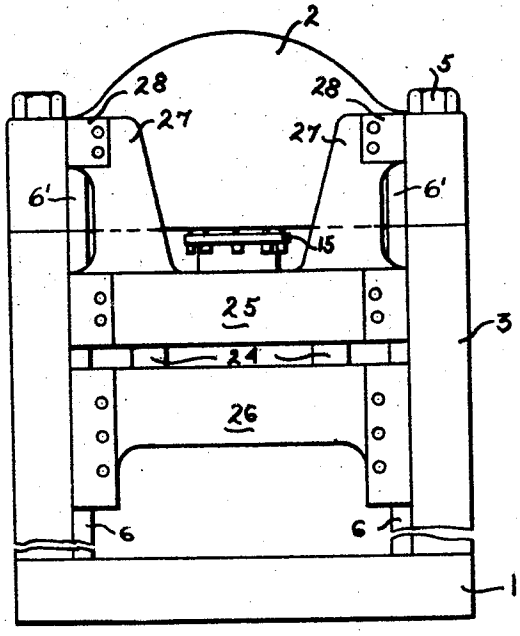


FIG. 6

INVENTOR
WALTER ERNST
BY
Toulmin & Toulmin
ATTORNEY

Sept. 4, 1945. W. ERNST 2,384,160

PRESS STRUCTURE

Filed March 7, 1942 3 Sheets-Sheet 3

FIG. 7

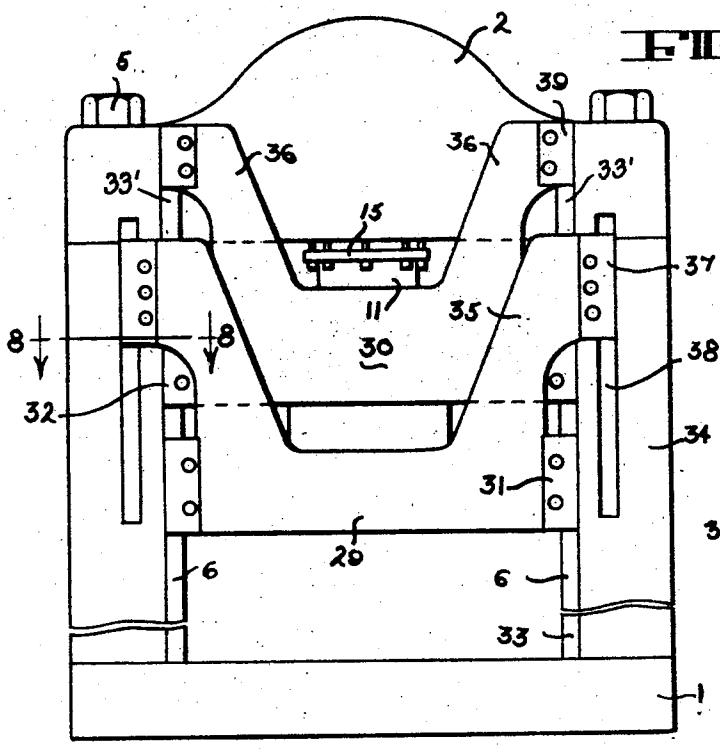


FIG. 8

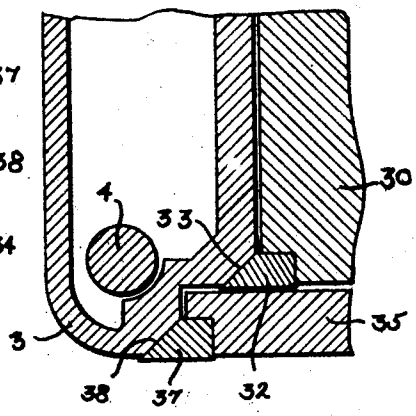


FIG. 9

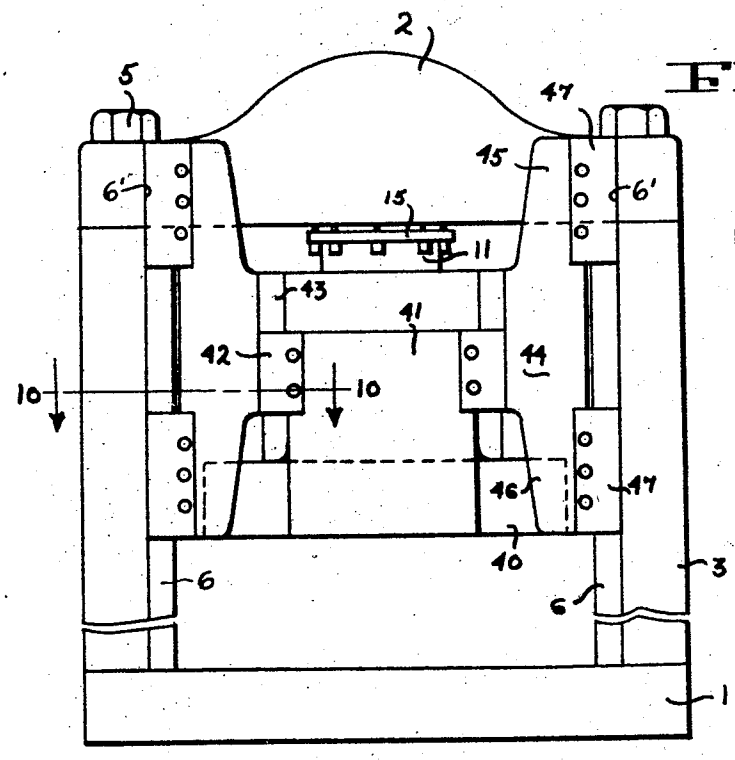
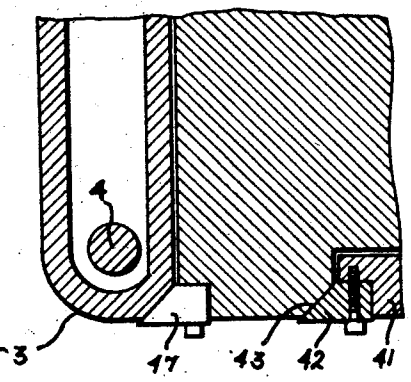


FIG. 10



INVENTOR
WALTER ERNST
BY
Toulmin & Toulmin
ATTORNEY

Patented Sept. 4, 1945 2,384,160

UNITED STATES PATENT OFFICE

2,384,160

PRESS STRUCTURE

Walter Ernst, Mount Gilead, Ohio, assignor to The Hydraulic Development Corporation, Inc., Wilmington, Del., a corporation of Delaware

Application March 7, 1942, Serial No. 433,716

10 Claims. (Cl. 113—38)

This invention relates to presses and, in particular, to presses having a relatively large press platen or punch slide.

With presses of this type, it is of extreme importance to maintain parallelism between the punch slide and the press bed, even under heavy eccentric loading conditions, in order to obtain the required accuracy.

It is, therefore, an object of this invention to provide improved means for maintaining parallelism between the press platen and punch slide and the press bed.

It is another object of the invention to provide a press structure in which the punch slide is provided with a tail portion having associated therewith means for aiding the proper guiding of said slide.

Another object of the invention consists in the provision of a press in which the press platen or punch slide is provided with a plurality of spaced extensions forming a part of auxiliary guiding means for said punch slide, while not preventing access to the packing for the ram actuating said slide.

It is a still further object of the invention to provide a press having a press platen and a blankholder platen, in which the press platen is guided in part on the blankholder platen and in part on the uprights of the press.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

Figure 1 illustrates a first embodiment of the invention.

Figure 2 is a section along the line 2—2 of Figure 1.

Figure 3 is a top view of Figure 1.

Figure 4 shows the invention in connection with a blankholder press.

Figure 5 is a section along the line 5—5 of Figure 4.

Figure 6 shows a simplified structure according to the invention.

Figure 7 is another embodiment of the invention.

Figure 8 is a section along the line 8—8 of Figure 7.

Figure 9 shows another press structure according to the invention, and

Figure 10 is a section along the line 10—10 of Figure 9.

General arrangement

According to the improved press structure of the present invention, the press platen proper is, in the usual manner, provided with guiding surfaces cooperating with correspondingly shaped guiding surfaces on the press, while an extension or tail connected to and extending from the press platen proper is provided with additional guiding surfaces cooperating with correspondingly shaped guiding surfaces on the uprights of the press.

Structural arrangement

Referring now to the drawings in detail, the press structure shown in Figure 1 comprises a press bed 1 and a press head 2 spaced by uprights 3 and interconected by strain rods 4 and nuts 5.

According to Figure 1, the uprights 3 are provided with guiding surfaces 6 extending from the upper end of the uprights 3 to the press bed 1, and the press head 2 is provided with the guide surfaces 6' which may be in substantial planar alignment with the surfaces 6. Cooperating with the surfaces 6 are the gibs 7 connected to the press platen 8 for guiding the latter. The press platen 8 comprises a portion 9 forming the press platen proper and extensions or tail portions 10 which carry the gibs 7'.

As will be clear from Figure 1, the gibs 7' carried by the extensions 10 cooperate with the guide surfaces 6' on the head 2. In this way, the platen 8 has an increased guiding area, which prevents misalignment of the press platen during the pressing operation and, therefore, maintains parallelism between the press platen and the press bed.

The press platen 8 is reciprocated, by means of a ram 11 having a piston portion 12 reciprocable in the press cylinder 13. The lower end of the press cylinder 13 comprises a ram packing 14 surrounding the ram 11 to prevent leakage from the press cylinder 13 toward the outside. While the extensions 10 and the gibs connected thereto afford an increased guiding area, they do not impede the access to the ram packing 14 and the gland 15 compressing the ram packing.

While Figures 1 to 3 show the invention in connection with a forging press, Figures 4 and 5 show the invention in connection with a drawing press.

The press of Figures 4 and 5 is similar to that of Figure 2 and similar parts are, therefore, designated with the same reference numerals.

The press of Figures 4 and 5 differs from that of Figures 1 to 3 primarily in that it comprises a blankholder platen 16 for clamping a work piece against the press bed 1 during the shaping operation. As will likewise be clear from the drawings, the blankholder platen 16 is provided with gibs

17 which cooperate with the guiding surfaces 6 of the uprights 3 for guiding the blankholder platen 16. The blankholder platen 16, in its turn, is provided with guiding surfaces 18 cooperating with gibs 19 for guiding the press platen 20. The press platen 20 has, similar to the press platen 8 of Figures 1 to 3, extensions 21 which are provided with gibs 22 cooperating with the guiding surfaces 6' on the head 2 and the surfaces 6 on the uprights 3 for guiding the said extensions and, thereby, the press platen 20. The press platen 20 is reciprocated by a press ram 23, while the blankholder platen 16 is reciprocated by means of plungers 24 reciprocable in the press platen 20.

While, according to Figure 4, the blankholder platen 16 is provided with additional guiding surfaces 18 for the gibs 19, the provision of these additional guiding surfaces may be omitted when adopting the structure of Figure 6. According to the press shown therein, the press platen 25 and the blankholder platen 26 are both guided by the guiding surfaces 6 on the uprights 3. Also in this structure, the press platen 25 is provided with extensions 27 carrying gibs 28 for cooperation with the guiding surfaces 6' on the head 2 and also, if the platen stroke be great enough for cooperation with the surfaces 6 on the uprights 3.

Referring now to Figures 7 and 8, the structure shown therein likewise illustrates a drawing press in which the blankholder platen 29 is shaped somewhat similar to the press platen 30. Both platens 29 and 30 have the lower ends thereof connected to gibs 31 and 32 respectively, which are slidable on the guiding surfaces 33 of the uprights 34. Furthermore, each of the platens 29 and 30 has extensions or tail portions 35, 36 respectively, of which the extension or tail portion 35 carries gibs 37 cooperating with guiding surfaces 38 on the uprights 34 for additionally guiding the blankholder platen 29. The extensions or tail portions 36 of the press platen 30 carry gibs 39 which, in the same manner as the gibs 32, are slidable on the guiding surfaces 33' of the press head 2, and the surfaces 33 of the uprights 34. Also in this structure the ram packing 14 and the gland 15 are easily accessible, due to the particular shape of the extensions 36.

The structure of Figures 9 and 10 differs from that of Figures 7 and 8 primarily in that the blankholder platen 40 is provided with extensions 41 (only one shown in the drawings), which are provided with gibs 42 adapted to slide on guiding surfaces 43 of the press platen 44 for guiding the blankholder platen 40.

The press platen 44 has upwardly and downwardly extending tail portions 45 and 46, which are provided with gibs 47 slidable on the guiding surfaces 6 and 6' for guiding the press platen. Also in this embodiment, the ram packing 14 and the gland 15 for compressing the same are easily accessible.

It will be understood that I desire to comprehend within my invention such modifications as come within the scope of the claims and the invention.

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

1. In combination in a press, a press head, a press bed, uprights spacing said head and said bed from each other, said uprights and said head being provided with guiding surfaces, a blankholder platen slidable on said guiding surfaces on said uprights, a press platen having guiding means associated therewith for cooperation with said guiding surfaces on said uprights to guide said platen, a ram for reciprocating said press platen, and a plurality of extension members arranged on opposite sides of said ram and connected to said press platen, said extension members being provided with auxiliary guiding means for cooperation with said guiding surfaces on said head to additionally guide said press platen.

2. In combination in a press, a press bed, a press head, uprights arranged between said press bed and press head, said uprights being provided with first guiding areas and second guiding areas, said head having guiding areas thereon substantially in alignment with said first guiding areas on said uprights, a press platen having connected therewith guiding means for cooperation with said first guiding areas to guide said platen, a ram connected to said press platen for reciprocating the same, extension members arranged on opposite sides of said ram and connected with said platen, said extension members having additional guiding means for cooperation with said guiding areas on said head to additionally guide said press platen, and a blankholder platen having means for cooperation with said second guiding areas to guide said blankholder platen.

3. In combination in a press, a press bed, a press head, uprights arranged between said press bed and press head, said uprights being provided with first guiding areas and second guiding areas, a press platen having connected therewith guiding means for cooperation with said first guiding areas to guide said platen, a ram connected to said press platen for reciprocating the same, extension members arranged on opposite sides of said ram and connected with said platen, said extension members having additional guiding means for cooperation with said first guiding areas to additionally guide said press platen, a blankholder platen having guiding means associated therewith for cooperation with said first guiding areas to guide said blankholder platen, and extension members connected to said blankholder platen on opposite sides of said ram and provided with guiding means for cooperation with said second guiding areas to additionally guide said blankholder platen.

4. In combination in a press, a press bed, a press head, uprights between said bed and said head, said uprights and said head being provided with aligned guiding surfaces, a press platen, main guiding means associated with said platen and cooperating with said guiding surfaces on said uprights for guiding said platen, a ram for reciprocating said platen, packing means compressed by a gland and surrounding said ram for preventing leakage around said ram and extension plates connected to said press platen extending upwardly therefrom to exteriorly adjacent said head and having their upper ends laterally spaced so as to permit access to said gland and said packing in all positions of said platen along its stroke, each of said extension plates having two arms carrying auxiliary guiding means spaced from said main guiding means and respectively cooperating with said guiding surfaces on said head for additionally guiding said press platen.

5. In combination in a press, a press base, a press head, upright means supporting said head in spaced relationship to said base, a press ram operable in said head, a press platen, operably connected to said ram, vertically arranged guiding surfaces on said upright means, guide means on said platen engaging said guiding surfaces for

reciprocably guiding the same, guiding surfaces on said head in surface alignment with said guiding surfaces on said upright means, and other guide means on said platen independent of said first mentioned guide means and spaced therefrom engaging said guide surfaces on said head to additionally guide reciprocation of said platen.

6. In combination in a press, a press base, a press head, upright means supporting said head in spaced relationship to said base, a press ram operable in said head, a press platen operably connected to said ram, vertically arranged guiding surfaces on said uprights means, guide means on said platen engaging said guiding surfaces for reciprocably guiding the same, guiding surfaces on said head in surface alignment with said guiding surfaces on said upright means, and other guide means on said platen independent of said first mentioned guide means and spaced therefrom engaging said guide surfaces on said head to additionally guide reciprocation of said platen and reciprocably movable in engagement with said guide surfaces on said head and said guide surfaces on said uprights during reciprocation of said platen.

7. In combination in a press, a press base, a press head, upright means supporting said head in spaced relationship to said base, a press ram operable in said head, a press platen operably connected to said ram, vertically arranged guiding surfaces on said upright means, guide means on said platen engaging said guiding surfaces for reciprocably guiding the same, guiding surfaces on said head in surface alignment with said guiding surfaces on said upright means, and other guide means on said platen disposed exteriorly of said head and independent of said first mentioned guide means and spaced therefrom engaging said guide surfaces on said head to additionally guide reciprocation of said platen.

8. In combination in a press, a press base, a press head, upright means supporting said head in spaced relationship to said base, a press ram operable in said head, a press platen operably connected to said ram and arranged within the exterior dimensions established by said upright means, vertically arranged guiding surfaces on said upright means disposed radially about said platen, guide members on said platen, each of said guide members engaging one of said guiding surfaces whereby to guide reciprocation of said platen, guiding surfaces on said head in planar alignment with said guiding surfaces on said upright means, and other guide members on said platen independent of said first mentioned guide members and spaced therefrom engaging said guide surfaces on said head to additionally guide reciprocation of said platen.

9. In combination in a press, a press base, a press head, upright means supporting said head in spaced relationship to said base, a press ram operable in said head, a press platen operably connected to said ram, vertically arranged guiding surfaces on said upright means, guide means on said platen and adjacent the bottom surface thereof engaging said guiding surfaces for reciprocably guiding the same, guiding surfaces on said head in surface alignment with said guiding surfaces on said upright means, and other guide means on said platen extending upwardly therefrom adjacent said head and exteriorly disposed relative to the same independent of said first mentioned guide means and spaced therefrom engaging said guide surfaces on said head to additionally guide reciprocation of said platen.

10. In combination in a press, a press head, a press bed, uprights arranged between said press head and said press bed, a press platen, said platen and said uprights being provided with cooperating guiding means for guiding said platen, a plurality of extension plates connected to said platen and arranged on opposite sides of said ram, said extension plates being provided with additional guiding means for cooperation with additional guiding surfaces on said press head thereby additionally to guide said platen, and a blank holder platen having connected thereto guiding means for cooperation with correspondingly shaped guiding surfaces on said press platen.

WALTER ERNST.