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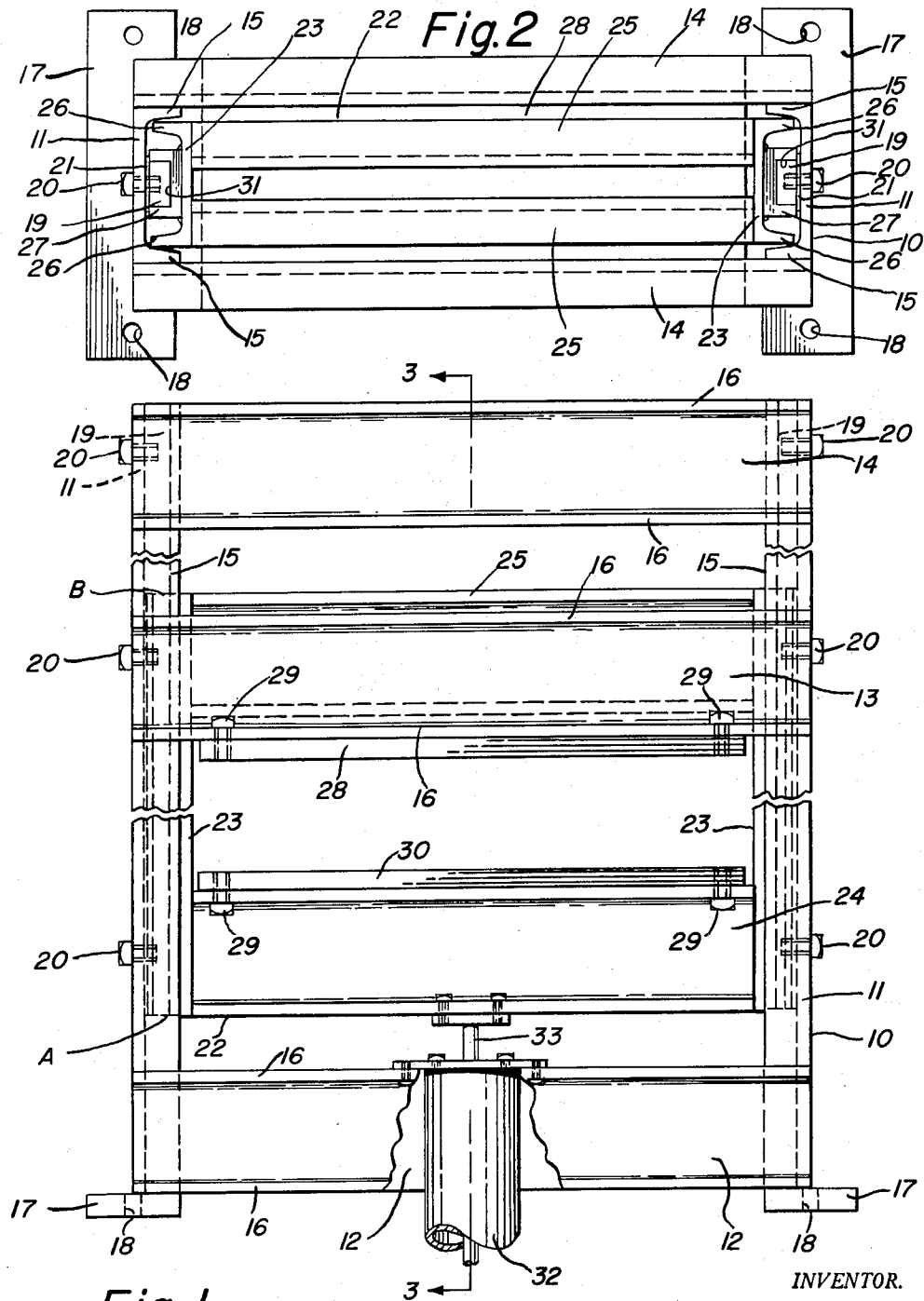
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DIE PRESS WITH EXTENDED GUIDE OR BEARING SURFACES

Filed March 11, 1955

2 Sheets-Sheet 1



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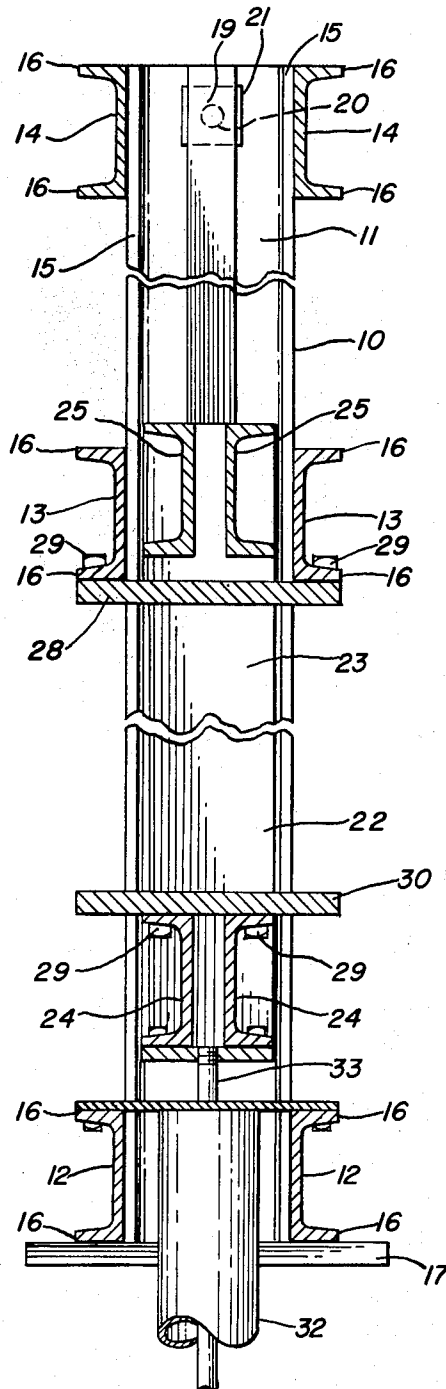
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DIE PRESS WITH EXTENDED GUIDE OR BEARING SURFACES

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2 Claims. (Cl. 100—214)

The present invention relates generally to presses, and more particularly to die presses such as are used in die shops to test dies.

It is customary in the tool and die industry to match the complementary halves of stamping dies, and the like, during the course of die manufacture, so that interferences, high spots, etc., can be noted and eliminated before the die is used in the production of the parts for which it is designed. This matching or testing procedure is generally accomplished by mounting the die halves or sections in a press and bringing them slowly together until they meet. By the use of a suitable indicator, such as Prussian blue on the die surfaces, interferences or lack of parallelism can be noted when the dies are separated.

Due to the high degree of accuracy and precision required in the dies, it is desirable that the press which is used in testing the dies shall also be rigidly and accurately constructed. If, for example, the platens on the press tend to tilt out of parallelism, or if the construction is such that parallelism cannot be accurately maintained during the stroke of the press, then the dies, which are mounted on the platens, will not come together properly, and the locating pins on the dies may jam in the locating holes, making it difficult to properly test the dies, as well as making it difficult to separate the dies.

Although production presses are obtainable, which could satisfactorily serve as die presses, such presses, due to their complexity and high cost, are uneconomical for non-production purposes and are seldom utilized in die shops.

It is the primary object of my invention to provide a press structure having improved means for accurately and rigidly maintaining registry and parallelism between the platens thereof.

Another object of my invention is to provide a precision die press of the character described which is of simplified construction and low in cost.

Still another object of my invention is to provide a press in which the guides for the movable platen are extended past the fixed or stationary platen, so that an extended guide surface is maintained during the stroke of the press.

Other objects and advantages of my invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a front elevation of a die press embodying the features of my invention.

Fig. 2 is a plan view of the press shown in Fig. 1.

Fig. 3 is a longitudinal cross-sectional view taken on line 3—3 of Fig. 1.

Referring more particularly to the drawings, I have shown a stationary frame 10 consisting of vertical standards or uprights 11, which are rigidly maintained in horizontally-spaced relationship by means of pairs of vertically-spaced cross-members 12, 13 and 14 which are fixedly connected to opposite sides of the standards 11, as by welding or the like. For simplicity of construction,

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I prefer that the standards 11 and the cross-members 12, 13 and 14 be formed of structural channel iron, as shown, with the legs 15 of the standards facing toward each other. The cross-members extend across the full width of the spaced channels 11, and the legs 16 of each pair of cross-members 12, 13 and 14 extend outwardly away from each other. The frame 10 also includes base or floor plates 17 which are fixedly secured, as by welding, to the lower ends of the standards 11 and are provided with openings 18 to permit the press to be suitably secured or anchored to the floor.

Mounted on the inner surface of each of the standards 11, medianly between the channel legs 15, is a vertically extending key or track 19 of rectangular cross-section. The key 19 extends downwardly from the upper edge of each standard 11 to a point representing the lowermost position of the movable platen, as will be hereinafter described. The key 19 is secured to the standard by means of a plurality of cap screws or bolts 20. At each point of securement, a shim or spacer 21 is provided between the key 19 and the standard 11, so that the parallelism of the oppositely disposed keys or tracks 19 can be accurately maintained during the assembly of the press. The use of the removable shims 21 also permits subsequent adjustment of the keys 19, such as may be required as a result of wear or the like.

The press also includes a movable frame 22 which is adapted to slide vertically in the stationary frame 10 and be guided thereby. The movable frame 22 includes a pair of vertically extending standards 23 which are preferably formed of channel iron, and which are maintained in horizontally-spaced relationship by pairs of cross-members 24 and 25 which extend between the standards 23 and are fixedly secured thereto, as by welding. The standards 23 are of smaller width than the standards 11 and the legs 26 of the channel members 23 extend outwardly so that they project between the oppositely extending legs 15 of the standard 11. Thus the standards 23 are nested or telescoped within the standards 11.

Fixedly secured, as by welding, to the outer face of each standard 23 is a vertically extending keyway 27 which is coextensive with the standard 23. The way 27 is preferably made of machined bar stock and is provided with a recess 31 of rectangular cross-section which is adapted to be slidably and closely engaged by the key or track 19. The width of the frame 22 is such that the legs 26 of channels 23 do not contact the standards 11 although they are spaced only slightly therefrom.

Fixedly secured, as by bolts 29, to the underside of the middle pair of cross-members 13 on frame 11 is a solid support plate or platen 28 on which one section or half of the die may be mounted in depending relationship. It will be noted that, as shown in Fig. 1, the width of the platen 28 is slightly less than the distance between the standards 23. A similar platen 30 is secured, as by bolts 29, to the upper side of the pair of cross-members 24 on the movable frame 22. The platen 30 may have the complementary section of the die mounted thereon for testing.

A hydraulic cylinder 32 is fixedly secured or anchored to the cross-members 12 and is provided with a movable ram 33 which is connected to the underside of the cross-members 24 on frame 22. The movable frame 22 can thus be caused to move upwardly or downwardly relatively to the stationary frame 11, in response to selective actuation of the hydraulic elevating mechanism 32—33. Any other suitable elevating mechanism could be employed if desired.

As heretofore indicated, it is of great importance that absolute parallelism be maintained between the movable platen 30 and the stationary platen 28, in order to avoid the difficulties in matching and separation of the dies

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which have previously been recited. It is recognized in the art that the greater the active length of guide surface engaged by the movable platen, the greater is the precision of movement and rigidity of the movable platen. However, from a practical standpoint, the active length of the guide surface which could be utilized has heretofore been limited to that portion of the guide surface which extends up to the stationary platen, as the guide means abutted the stationary platen support means at that level.

In the die press herein disclosed, the active length of the guide surfaces or vertical bearing surfaces engaged by the movable platen 30 extends from a point or level above the stationary platen 28 downwardly to the lowermost position of the movable platen 30. Therefore, in the disclosed press structure, the prior art limitation on the length of the guide surface has been eliminated and an extended guide surface can feasibly be employed to obtain the features of rigidity and parallelism which have heretofore only been obtainable by relatively larger and more massive press structures.

In Fig. 1 the movable platen 30 is shown in its lowermost position. It will be noted that the active guide surface for the platen 30 extends from the point A, near the bottom of press structure, to the point B, which is well above the level of the platen 28. The linear distance between the points A and B, which corresponds to the effective or active length of the guide means, can thus be considerably greater than the distance between platens 28 and 30 and can also be greater than the vertical distance between platen 28 and cross member 12 or between platen 28 and the lower end of the standards 11. Thus the effective length of the guide means is not restricted by the reference dimensions above mentioned, as has previously been the case, but can be effectively extended, irrespective of such reference dimensions, to provide a length sufficient to obtain the desired rigidity of movement of the movable platen 30.

The standards 11 extend above the standards 23 a sufficient distance to accommodate the maximum elevation of platen 30 in response to the maximum stroke of the hydraulic ram 33.

It will be apparent that in the operation and utilization of the die press, each section of the die to be tested is mounted on one of the platens 28 or 30. The hydraulic ram 33 is then actuated by means of suitable control mechanism (not shown) to cause elevation of the movable platen 30 and frame 22. During the course of elevation, the ways 27 slide over the keys 19 between the moving points A and B, this extended guide surface thus providing the necessary precision of movement which prevents the platen 30 from deviating from the parallelism with platen 28 which had been initially established in the assembly of the press.

The platen 30 moves upwardly until the dies to be tested are joined, and the platen is so maintained as long as de-

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sired. Subsequently, the platen 30 is lowered to disengage the dies, after which they can be further inspected or removed if desired.

The arrangement of the channel members 23 and channel members 11 is such that the guide means are substantially shielded against injury and against dirt and foreign objects. The use of relatively inexpensive structural iron, instead of massive machined castings, for the press permits the press to be produced and sold at a low cost commensurate with the needs of the diemaker. Nevertheless, the frame structures and the novel extended guide surfaces provide the requisite rigidity which is desired by die shops in such a press.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of my invention, or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a press structure, a stationary frame, a first platen fixedly secured to said frame, a movable frame extending above and below the level of said first platen, continuous vertically extending guide means fixedly secured to said stationary frame, said guide means being coextensive with the upper and lower limits of the path of movement of said movable frame, continuous vertically extending bearing means mounted on said movable frame coextensive therewith and slidably engaging said guide means, and a second platen fixedly secured to said movable frame for movement relatively to said first platen.

2. A combination as defined in claim 1 wherein said stationary frame includes a pair of vertically extending channel members rigidly connected in parallel spaced relationship to each other, said channel members having inwardly disposed leg portions, said movable frame including a second pair of vertically extending channel members rigidly connected in parallel spaced relationship to each other, said second pair of channel members having outwardly disposed leg portions, said second pair of channel members being maintained intermediate the leg portions of said first pair of channel members to define a vertically extending enclosure between said leg portions of said channel members, and said guide means and bearing means are contained within said enclosure.

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