

May 3, 1966

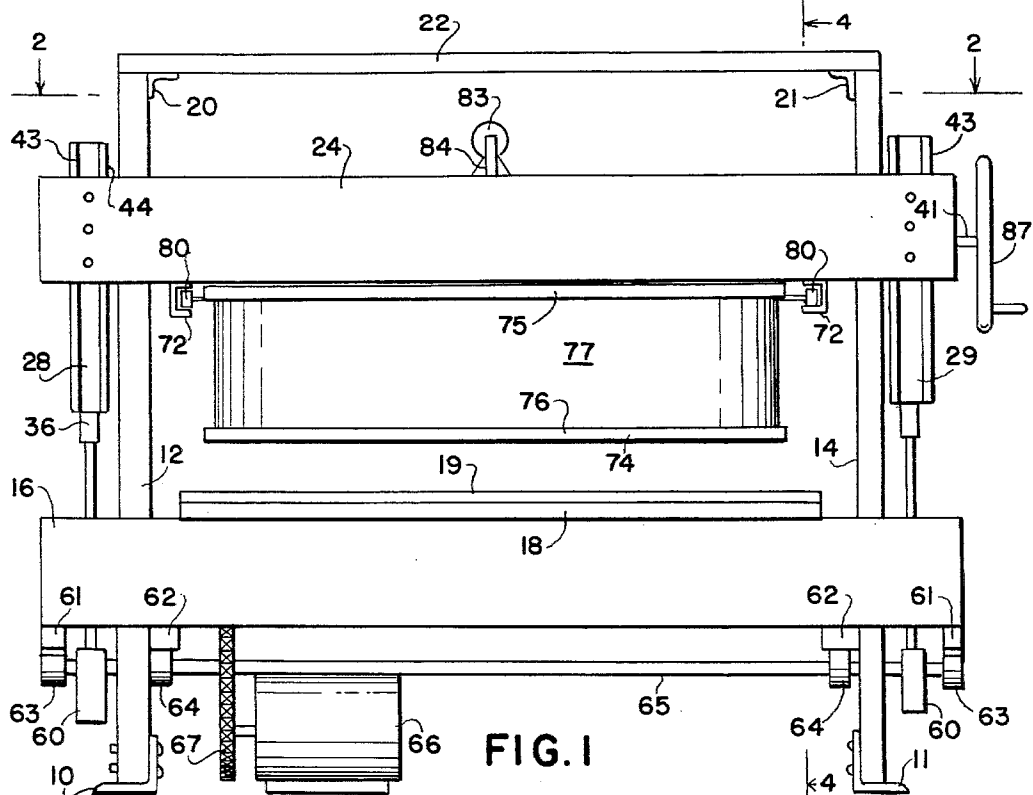
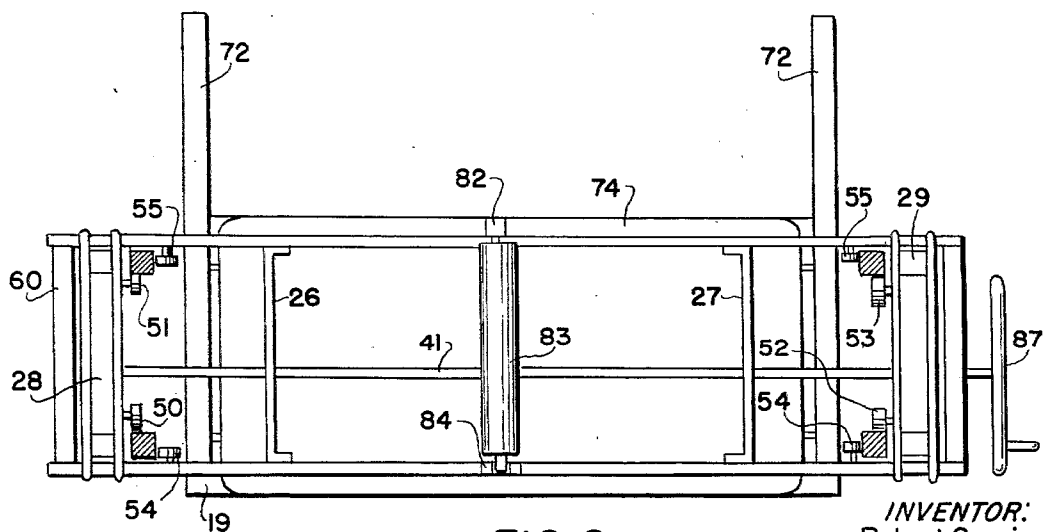
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3,248,984

DIE CUTTING PRESS

Original Filed March 15, 1962

3 Sheets-Sheet 1



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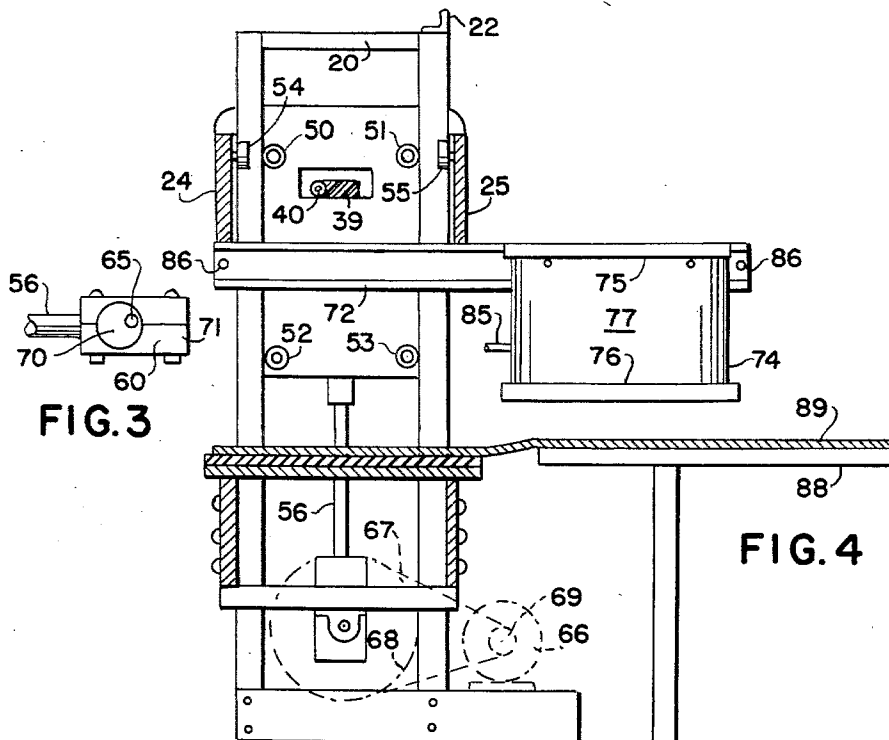
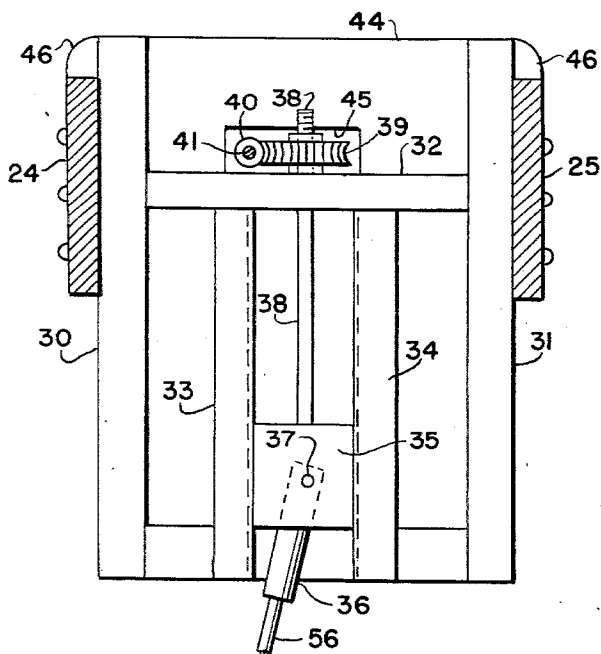


FIG. 5

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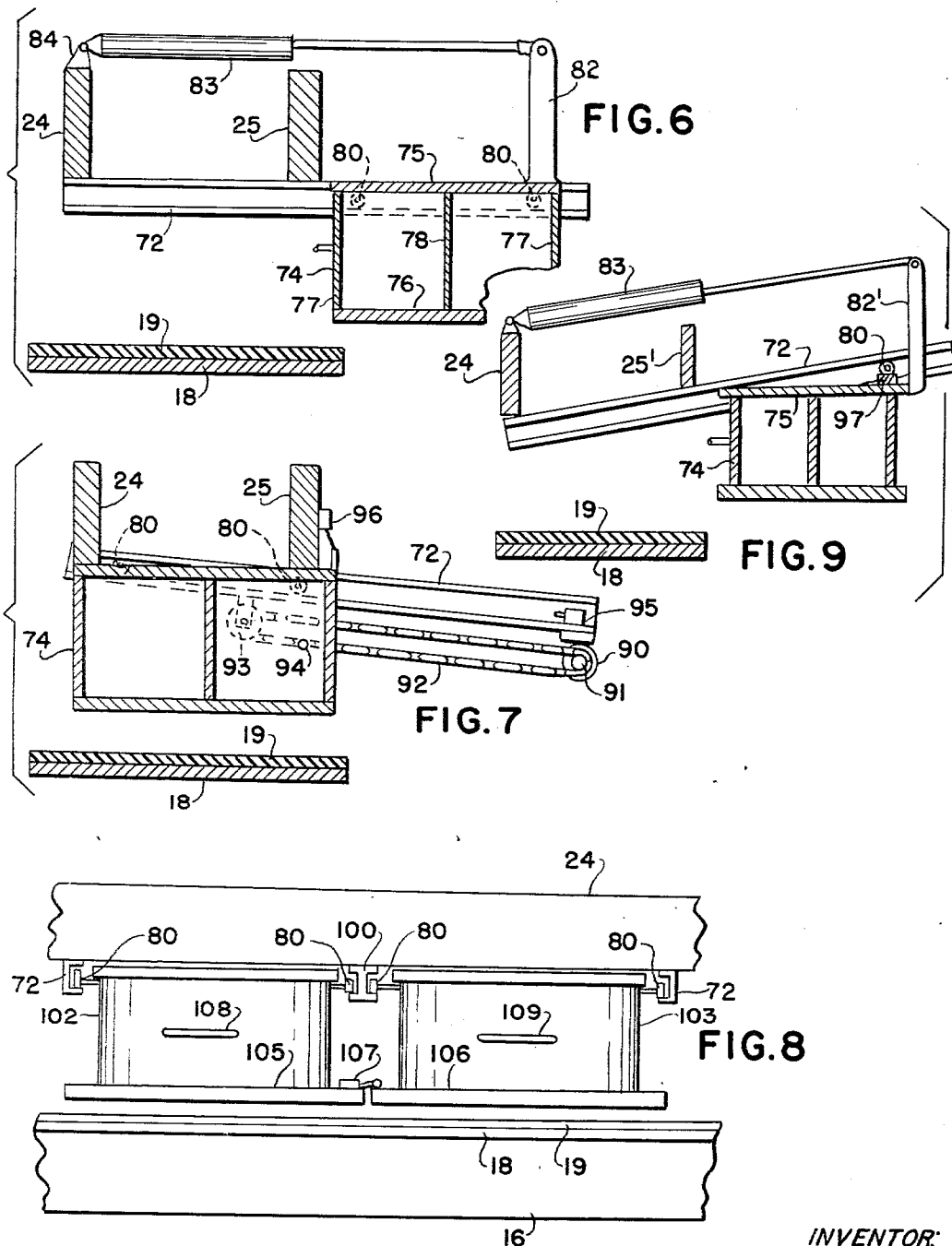
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3 Sheets-Sheet 3



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DIE CUTTING PRESS

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Continuation of application Ser. No. 179,862, Mar. 15,
1962. This application Dec. 23, 1963, Ser. No. 333,271
7 Claims. (Cl. 83-533)

This application for patent is a continuation of my presently pending patent application Serial No. 179,862.

This invention relates in general to presses and, more particularly, to die cutting presses having a vertically reciprocating platen which is horizontally movable.

An object of this invention is to provide a more simple, rugged and foolproof large capacity die cutting press.

Another object of this invention is to provide a die cutting press which will apply large forces with a negligible distortion or flexing of the main machine elements.

A further object of this invention is to provide a die cutting press having a large bed and a platen substantially covering the bed, the platen being rearwardly movable when the press is in its raised position to enable an operator to have free and unencumbered access to the bed of the press.

Many other objects, advantages and features of invention reside in the particular construction, arrangement and combination of parts involved in the embodiments of the invention as will be understood from the following description and accompanying drawing where-in:

FIGURE 1 is a front view of a first embodiment of the die cutting press;

FIGURE 2 is a horizontal section taken on lines 2—2 of FIGURE 1;

FIGURE 3 is a side view of an eccentric;

FIGURE 4 is a vertical section taken on line 4—4 of FIGURE 1 showing a second embodiment of the invention with a table in position behind the press;

FIGURE 5 is a side view of a vertical slide with one side plate removed to show interior construction;

FIGURE 6 is a vertical section through the bed of the press and two lateral head members showing a platen mounted according to the first embodiment of this invention;

FIGURE 7 is a vertical section through two lateral head members and the bed of the press showing a platen mounted according to a third embodiment of this invention;

FIGURE 8 is a front view of a fragment of the central portion of a die cutting press according to a fourth embodiment of this invention showing two independently mounted platens; and

FIGURE 9 is a vertical section through two lateral head members and the bed of a press showing a platen mounted according to a fifth embodiment of this invention.

Referring to the drawing in detail, FIGURES 1, 2 and 4 show the overall appearance of the first and second embodiment of the die cutting press. Two base members 10 and 11 have the four vertical uprights 12, 13, 14 and 15 bolted to them. The front and rear bed support beams 16 and 17 are bolted, respectively, to the foremost vertical uprights 12 and 14 and the rearmost vertical uprights 13 and 15. Disposed horizontally on top of the bed support beams 16 and 17 is the horizontal steel press bed 18 which has a hard rubber or other suitable covering 19.

Referring now to FIGURE 1, it may be seen that the uppermost ends of the vertical uprights 12 and 13 are joined by an angle iron bracing member 20 and the upper ends of the vertical uprights 14 and 15 are likewise joined by a bracing member 21. One or more lateral braces 22 may extend between the braces 20 and 21.

As may be further seen in FIGURES 1 through 5, two lateral head members 24 and 25 extend in front and in back of the vertical uprights above the bed support beams 16 and 17. As shown in FIGURE 2, two braces 26 and 27 may be fixed between the head members 24 and 25 to secure them relative to each other. Disposed beyond the vertical uprights are the two slide members 28 and 29. As shown in FIGURES 4 and 5, the slide members 28 and 29 are bolted between the head members 24 and 25. Each slide member consists of the two uprights 30 and 31 which are joined by the cross-member 32. Two ways 33 and 34 extend downward from the central portion of the cross-brace 32 and slidably secure a block 35 between them. Each block 35 has a link 36 pivotally secured to it by means of a pin 37. A threaded shaft 38 extends upward from each block 35 through an aperture in the cross-member 32 to have a worm wheel 39 turned downward about it. A worm 40 is mounted on each end of a shaft 41 so that two worms 40 engage the worm wheels 39. Therefore, as the worm wheels 39 are rotated by means of the worms 40, the shafts 38 will be drawn upward or allowed to move downward to position the blocks 35 along the ways 33 and 34.

Each slide member 28 and 29 has two side plates 43 and 44 bolted to it. These side plates 43 and 44 have suitable apertures 45 cut in them to accommodate each worm wheel 39 which is wider than the uprights 30 and 31 and the cross-member 32. The upper portions of the side plates 43 and 44 extend outward to form the projections 46 which extend beyond the uprights 30 and 31 and rest on top of the lateral head members.

Referring now to FIGURES 2 and 4, sealed ball bearing rollers 50, 51, 52 and 53 are mounted on the inwardly facing side plates 44 of each slide member 28 and 29. These rollers are sealed ball bearings which bear or ride on the inwardly facing surfaces of the vertical uprights 12, 13, 14 and 15. In addition, the rollers 54 and 55 are fixed to the inwardly facing surfaces of the lateral head members to bear on the other inwardly facing surfaces of the vertical uprights 12, 13, 14 and 15. Thus it may be seen that the entire assembly comprising the two lateral head members 24 and 25 and the two slide members 28 and 29 may move vertically upward and downward along the vertical uprights.

Referring now to FIGURES 1 and 4, it may be seen that a rod 56 extends downward from each link 36 to an eccentric 60. The rods 56 may be formed with right and left-hand threads at their ends which engage the links 36 and the eccentrics 60. Thus the rods 56 may be turned to adjust their effective lengths and level the lateral head members 24 and 25.

As shown in FIGURE 1, a transverse member 6 extends between each end of the bed support beams 16 and 17 a short distance beyond the vertical uprights. Another transverse member 62 extends between the bed support beams 16 and 17 between the vertical uprights and adjacent to them. These transverse members 60 and 61 rest against the lower edges of the bed support beams and they have the bearing blocks 63 and 64 fixed to their bottom surfaces.

A shaft 65 extends through the bearing blocks 63 and 64 and has the eccentrics 60 mounted on it. As shown in FIGURES 1 and 4, a large low speed gear motor 66 drives the shaft 65 by means of a chain 67 and two sprockets 68 and 69. As shown in FIGURE 3, each eccentric 60 consists of an eccentrically mounted disk 70 fixed on the shaft 65 which is rotatably secured within the body 71 of the eccentric 60.

Referring now to FIGURES 1, 2 and 6, two channel-shaped rails 72 are welded beneath the lateral head members 24 and 25 and extend rearwardly beyond them.

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A platen 74 consists of an upper plate 75 and a lower plate 76 joined by a thinner outer wall 77 which may contain the additional vertical partitions 78. The platen 74 is slidably held beneath the lateral head members 24 and 25 by means of rollers 80 which ride within the channel-shaped rails 72. As shown in FIGURE 1, the rollers 80 support the upper plate 75 of the platen 74 with a slight clearance below the lateral head members 24 and 25.

Referring now to FIGURE 6, an upward extension 82 is welded or otherwise secured to the rearmost portion of platen 74. An air cylinder 83 is fixed to the top of the lateral head member 24 by means of a suitable bracket 84. Therefore, as shown in FIGURES 1, 2 and 6, when the air cylinder 83 is activated by a suitable means such as an air supply and suitable valving (not shown) the platen 74 will be rolled rearwardly along the tracks 72 from beneath the lateral head members 24 and 25 to leave the bed 18 of the press completely clear and unobstructed. Upon retracting the cylinder 83, the platen 74 will be rolled back beneath the lateral head members 24 and 25.

As shown in FIGURE 4, a second embodiment of this invention has a handle 85 fixed to extend forward from the front of platen 74. Suitable stops 86 are fixed in the rails 72 to limit the movement of the platen 74 along the rails 72. In this modification of the invention, the platen 74 is manually pushed rearwardly by means of the handle 85 by an operator.

This die cutting press is operated in the following manner. A hand wheel 87 is fixed on one end of the shaft 41 so that it may be rotated. As shown in FIGURE 5, as the shaft 41 rotates, it turns the worm wheels 39 in the slide members to move the blocks 35 along the ways 33 and 34. Thus the hand wheel 87 may be rotated to raise or lower the slide members and, thereby, the lateral head members 24 and 25. When the platen 74 has been set by means of hand wheel 87 so that the bottom of its stroke will be at a desired height, suitable switches (not shown) may be closed by an operator to cause the motor 66 to rotate and complete enough revolutions to rotate the shaft 65 once. The platen 74 is urged rearwardly, manually by means of handle 85 or pneumatically by means of the cylinder 83. Material 89, to be cut on this die cutting press, may then be easily drawn from a table 88 disposed behind the bed 18. As many thicknesses as it is desired to cut are drawn on top of the hard rubber or other surface 19.

With the platen 74 still in a rearward position, multiple cutting dies of the desired shape may easily and accurately be placed upon the material to be cut over the entire surface of the bed 18. The placing of the dies over the bed is completely safe because, even should the press accidentally become activated, the platen 74 cannot come down upon the hands of an operator and crush them as the platen 74 is not positioned over the bed 18. After placing the dies on the material, the operator then manually or by means of cylinder 83 slides the platen 74 forward over the bed 18 and beneath the lateral head members 24 and 25. Upon the activation of motor 66, the slide members 28 and 29 and the lateral head members 24 and 25 are drawn downward. The lateral head members then contact the top plate 75 of platen 74 and urge it downward with great force to die cut the material 89. Upon the completion of the stroke of the press, the platen 74 may again be slid rearwardly so that more material 89 may be drawn over the bed of the press and the dies may be repositioned upon it. If it is desired in certain operations, the dies may be fixed to the bottom plate 76 of the platen.

Referring now to FIGURE 7, a second embodiment of this invention has the channel-shaped rails 72 slope downward from the rear of the die cutting press. The rollers 80 are fixed to the platen 74 to support it in a

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horizontal position between the rails 72. A motor 90 is fixed below the rearmost end of one rail 72. The motor 90 drives a sprocket 81 about which there is disposed the chain 92. Another sprocket 93 is rotatably fixed below the rail 72 and has the chain 92 extend about it. A pin 94 extends from the platen 74 and is fixed to the chain 92. Therefore, when the motor 90 rotates and the sprocket 91 drives the chain 92, it will slide the platen 74 along the rails 72. Suitable limit switches 95 and 96 may be provided to stop the motor 90 when the platen 74 is in a desired operative or inoperative position. The downward and rearward sloping of the rails 72 provides a considerable safety factor in that, upon any failure of the motor 90 or of any of its associated platen drive mechanisms, the platen 74 will roll downward and rearward into a safe position in which it cannot harm the operator.

As shown in FIGURE 9, the rails 72 are inclined upward from the rear of the die cutting press. The rollers 80 are fixed to the platen 74 in such a way that it is suspended by the rails 72 in a horizontal position. The rearwardly disposed lateral head member 25' must have its lower edge cut away to enable the platen to slide rearwardly and upwardly beneath it. One or more blocks 97 may be fixed on top of the rearmost edge of the upper plate 75 of the platen 74 so that, when the platen 74 is disposed beneath the lateral head members 24 and 25', the lower edge of the lateral head member 25' will contact the block 97 to urge the platen 74 downward.

As shown in FIGURE 8, two channel-shaped rails 72 are fixed to the lateral head members 24 and 25 and extend rearwardly from them. A central I-beam shaped rail 100 is also fixed to the lateral head members between the rails 72. Two platens 102 and 103 are slidably suspended by means of the rollers 80 between the channel-shaped rails 72 and each side of the central rail 100. The lower portions 105 and 106 of the platens 102 and 103 may be locked together by means of a suitable latch 107. As shown in FIGURE 8, the platens 102 and 103 may be moved rearwardly by means of the handles 108 and 109. This embodiment of the invention enables an operator to open the latch 107 and only use one-half of the work space of the press. The lighter weight of the smaller platens 102 or 103 may be more easily and rapidly moved rearward and then drawn forward by an operator. If the entire area of the press is to be used, the latch 107 may be engaged so that the platens 102 and 103 may be rolled back and forth as a single unit.

While I have disclosed my invention with particularity in the best forms known to me, it will nevertheless be understood that these are purely exemplary and that modifications may be made without departing from the spirit of the invention except as it may be more limited in the appended claims wherein I claim:

1. A die cutting press comprising, in combination, four vertical uprights disposed in two pairs, one to the side of the other, bed support beams fixed to said vertical uprights in front and behind said uprights, a slide member guided by each pair of uprights and disposed above said bed support beams, lateral head members fixed to said slide members above said bed support beams, a press bed on said bed support beams, two inner transverse members extending across the bottom edges of said bed support beams between said pairs of uprights, two outer transverse members extending across the bottom edges of said bed support beams beyond said uprights, rods pivotally connected to each of said slide members and extending between said inner and outer transverse members, a shaft rotatably mounted below said inner and outer transverse members beneath said press bed, eccentrics mounted on said shaft between each pair of said inner and outer transverse members, said eccentrics being connected to said rods and drawing said rods and said slide members downward upon the rotation of said shaft, means rotating said shaft, rails fixed to the bottom of and extending rearwardly beyond said lateral head members, a top plate,

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a platen of substantially the size of said bed secured to said top plate a given distance below said plate, said platen substantially covering said bed, rollers riding on said rails supporting said top plate slightly below said lateral head members, and means to roll said platen and said plate rearwardly along said rails substantially uncovering said press bed, said lateral head members engaging said top plate forcing said platen downward when said platen is over said press bed and said means rotating said shaft rotates said shaft.

2. The combination according to claim 1 wherein said rails are disposed near said vertical uprights, said plate extends between said rails, and said plate and said platen extend substantially over said press bed.

3. The combination according to claim 1 wherein more than two rails extend rearwardly from said lateral head members and wherein at least two plates and two platens are movably supported by said rollers riding on said rails, said platens substantially covering said press bed when said two platens are rolled forward over said press bed.

4. The combination according to claim 3 with the addition of latch means locking said platens together to roll as a single unit along said rails.

5. The combination according to claim 2 wherein said slide members each comprise two vertical members fixed to the inside of said lateral head members and extending above and below said lateral head members, two side plates fixed to said vertical members and extending across said vertical members, said side plates having projections extending beyond said vertical members and resting on top of said lateral head members, a cross brace fixed transversely between said vertical members and said side plates, and means pivotally connected to one of said

rods and to said cross brace, each of said slide members extending vertically a distance greater than the distance between the vertical uprights in each pair of vertical uprights.

6. In a die cutting press, a press bed, two lateral head members extending laterally over said press bed, means moving said lateral head members downward and then back upwards over said press bed, rails fixed below and extending rearwardly behind said lateral head members and said press bed, a top plate, a platen fixed a given distance below said top plate, rollers riding on said rails movably securing said platen and said top plate below the bottom edges of said lateral head members, and means to roll said platen rearwardly from above said press bed, said platen substantially covering said press bed when said platen is rolled over said press bed.

7. The combination according to claim 6 wherein said top plate extends substantially over said press bed directly below said lateral head members, said lateral head members engaging said top plate forcing said platen downward when said platen is over said press bed.

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