

L. A. CASGRAIN.
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1,016,983.

Patented Feb. 13, 1912.

2 SHEETS—SHEET 1.

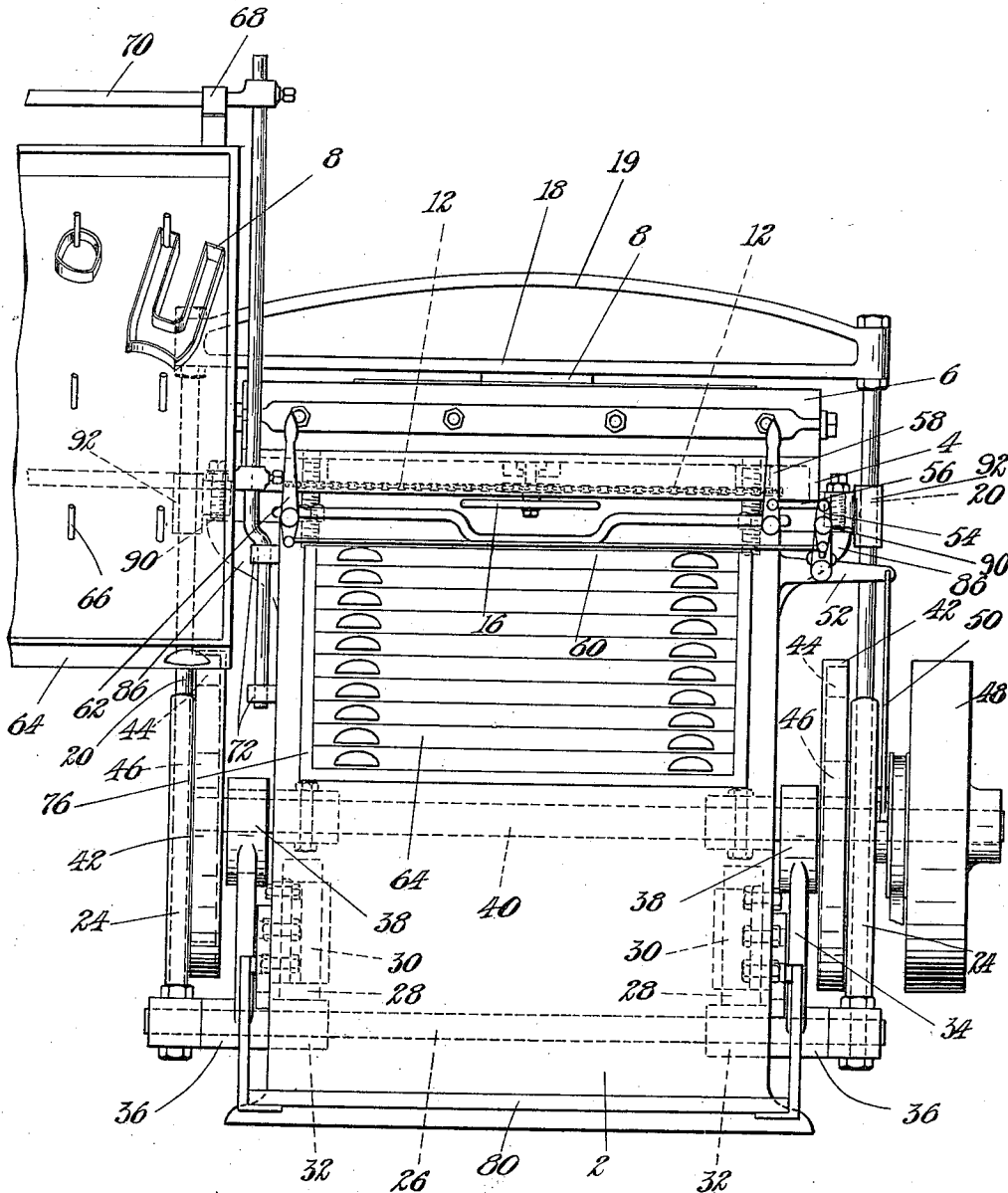


Fig. 1.

WITNESSES.

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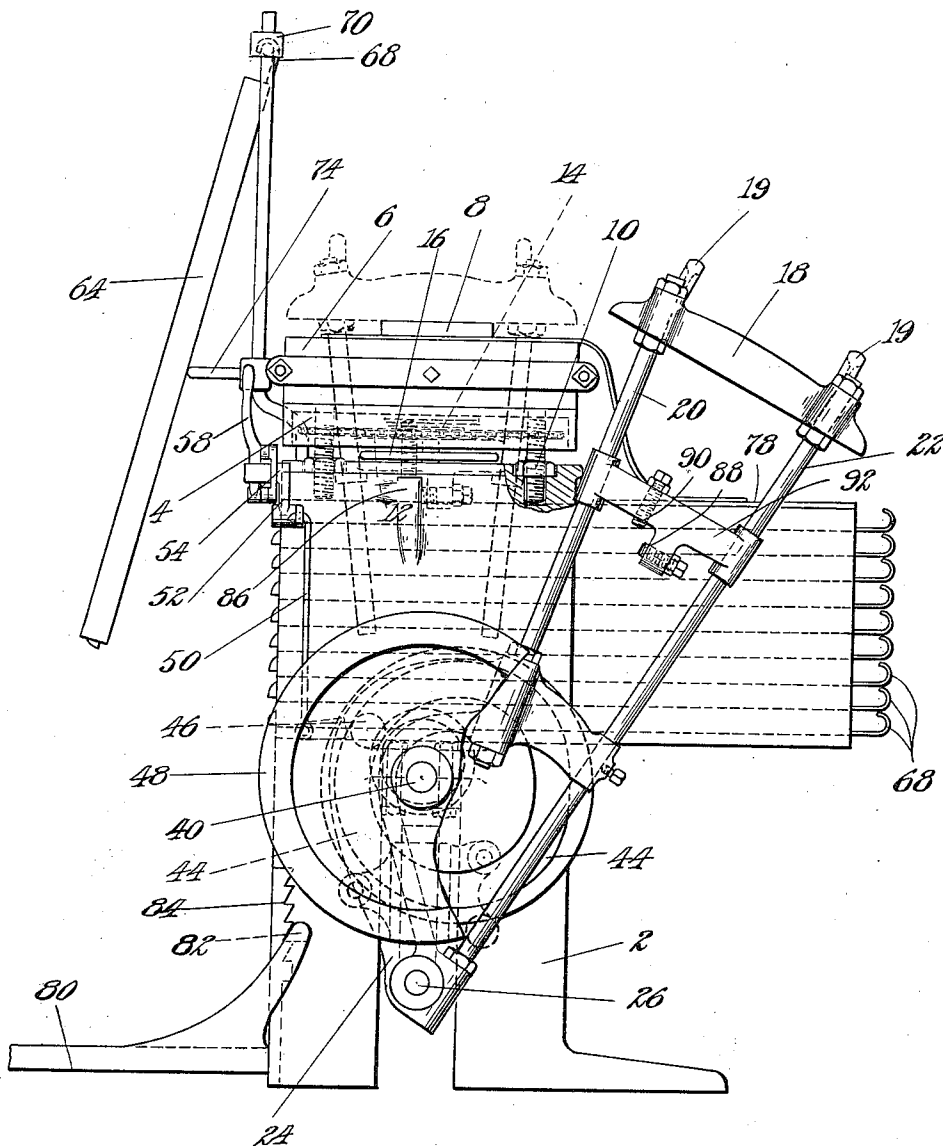
Louis H. Casgrain
By his Attorney,
Nelson M. Howard

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2 SHEETS—SHEET 2.



WITNESSES.

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Fig. 2.

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UNITED STATES PATENT OFFICE.

LOUIS A. CASGRAIN, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PRESS.

1,016,983.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS A. CASGRAIN, a citizen of the United States, residing at Beverly, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Presses, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to presses in which the presser members are relatively movable not only in a direction to effect a pressing operation, but also in another direction or in other directions, and in particular the invention relates to a press in which the presser members are relatively movable to place one of them out of the way of the operator, so that he may conveniently inspect work preferably supported upon the other.

A general object of the invention is to provide a machine of the class described which shall be entirely automatic so far as relative movements of the presser members are concerned.

A particular object of the invention is the provision of a press of the type in which a pressure applying member is movable into and out of operative position over a die placed upon any portion of the surface of a cooperating bed, or upon stock thereon, which is so constructed that the pressure applied to the die during the pressure applying operation shall be substantially the same in whatever position over or upon the surface of the bed the die may be placed.

An important advantage of a construction of the kind just described is that the surface of the bed will not be cut to unequal depths in different parts, whereby resurfacing may be effected more easily, and that the amount of pressure essential to press the die through the stock to be died out may be reduced to a minimum. It will readily be seen that if the pressure applying member exerts unequal pressures upon the die when it is located over different parts of the surface of the bed, the minimum pressure essential to press the die through the stock must be exerted at that location over the bed where the pressure applied to the die by the

pressure applying member is the least. In such a construction it will be obvious that at other locations upon the bed, where the pressure applying member exerts a greater pressure upon the die, more than the minimum pressure essential to force the die through the stock will be applied to the die and that therefore the die will be forced farther into the bed, to the injury of the latter at this point.

A convenient construction for carrying out the just described object of the invention is one in which the pressure applying member is movable bodily into and out of operative position over its bed, said member having preferably a pressure applying surface of an area substantially equal to the pressure receiving surface of its bed whereby it may conveniently be moved at each operation into such position over its bed that every portion of the pressure receiving surface of the bed has opposed to it a portion of the pressure applying surface of said member.

Another object of the invention is the provision of a press in which the parts bear such a relation to each other when in inoperative position and at the time when the operator is positioning the die upon the selected portion of stock that a maximum illumination of the work may be obtained.

Other objects of the invention are the provision of a press of the type above referred to which shall combine lightness of construction with rigidity of the light parts, thereby permitting effective operation at a comparatively high rate of speed; the provision of means for quickly and accurately effecting a relative adjustment of the presser members; the provision of novel and convenient die holding means; the provision of means for insuring that the hands of the operator shall be out of the way of the presser members before the relative movement of said members commences; and the provision of means for preventing overthrow of the parts during their operative movements due to backlash in the operating means or connections.

In its illustrated preferred embodiment the invention is shown as applied to a press of the type known to the trade as "clicking

press," intended particularly for dying out parts of uppers, and the movable pressure applying member is shown as having an area sufficient so that when in operative position over the stock-supporting bed it may engage, in its pressing movement, a die placed anywhere upon stock lying upon the opposed face of said bed, and if desired several blanks may be died out at one operation. The pressure applying movement of the pressure applying member is effected at the close of the movement of said member into operative position over the bed and is truly rectilinear, thereby securing the important advantage that the pressure applied to the die is uniformly and simultaneously applied to all parts of the said die. Preferably the pressure applying member is movable bodily rearwardly away from the bed, as shown, a convenient way to effect such movement being to mount the member upon supports which swing with it about a horizontal axis. It will be understood, however, that the invention is not limited to the particular direction of movement described nor to the illustrated arrangement for providing for such movement.

In the accompanying drawings,—Figure 1 is a front elevation broken away at one side of a machine embodying the invention of this application, one of the die-holding trays being shown in the position in which it is placed when the operator is using the set, or sets, of dies which it holds; Fig. 2 is a side elevation of the machine shown in Fig. 1, the pressure applying member being shown in full lines in inoperative position and in dotted lines in operative position.

The standard or frame 2 of the machine has adjustably mounted upon its upper end a support 4 for a cutting bed or die block 6, usually of wood, upon the upper face of which the stock to be died out by suitable dies 8 is supported. Adjusting screws 10, one for each corner of the support 4, are provided with sprocket wheels about which passes a chain 12 by which all the screws may be turned simultaneously from a central sprocket wheel 14 adjustably mounted upon the under side of the support 4 and having upon its shaft a hand wheel 16. Adjustment of the sprocket wheel together with its shaft upon the under side of the bed 4 serves to tighten or to loosen the sprocket chain. The pressure-applying member shown in the present application comprises a plate or bar 18 which has an under surface area sufficient to cover the block 6 when in operative position thereover and is mounted upon a frame comprising rods 20 and 22 at each end connected to castings of brackets 24, one of which

arches around the driving shaft of the machine, the castings at the two ends of the machine being alike for convenience in manufacture and being connected together by a rod 26.

The plate or bar 18 is provided with stiffening ribs 19 and together with its supporting frame is arranged to be moved both vertically and laterally with respect to the bed 6. The vertical movements of the frame are guided by plungers traveling in vertical guides 30 on the frame 2 and sleeved at their lower ends 32 upon the connecting rod 26. The vertical movements of the frame are effected through links 34 sleeved at one end 36 upon the connecting rod 26, thereby constituting supporting bearings in which the frame turns, and having at the other end an eccentric collar 38 surrounding an eccentric on the driving shaft 40 of the machine.

The lateral movements of the frame with respect to the bed which, in the illustrated preferred construction, are oscillating movements and are intended to bring the bar or plate 18 into and out of operative position over the bed 6, are effected through cam wheels 42 on the shaft 40 provided with cam grooves 44 in which travel cam rolls 46 on the arched portions of the castings 24. The cam grooves 44 bear such relation to the eccentrics on the shaft 40 that the plate 18 is brought into position over the bed 6 before it is depressed by the eccentrics to perform the pressure applying operation.

The parts described are preferably so adjusted that the plate is depressed by the eccentrics only a short distance during the pressure applying operation. To insure therefore that the operator shall remove his hands from the block before the movements are started which bring the plate 18 into operative relation to the bed 6, a starting means is provided which requires the use of both hands of the operator to operate it. In the illustrated embodiment this starting means comprises a clutch of any suitable construction by which a loose belt pulley 48 may be clutched to the shaft 40 and means for operating said clutch, comprising a rod 50 provided at one end with any suitable clutch tripping member and connected at its other end to one arm of an angle lever 52 pivoted upon the frame 2. Pivoted upon the other arm of the angle lever 52 is an equal arm lever 54, one arm of which is connected by a rod 56 to a lever of the "second class" to be operated by the right hand of the operator and the other arm of which is connected by a rod 60 to a lever of the "first class" to be operated by the left hand of the operator. It will be seen that with this arrangement the ends

of the lever 58 and 62, which are intended to be grasped by the operator, will have to be moved toward each other before starting motion will be transmitted by the equal arm lever 54 to the angle lever 52.

As hereinbefore suggested, in its illustrated preferred embodiment the invention comprises means for supporting in convenient reach of the operator the dies of the set which he is using, together with means for storing, in convenient relation to the machine, other sets of dies. The illustrated means comprises a stack of die trays 64 provided with pins 66 by which the dies may be positioned in the trays and upon which the dies may hang when the trays are supported by hooks 68 upon the arm 70 of a tray supporting frame hinged at 72 to the frame 2. The other arm 74 of the tray supporting frame is shaped to hold the tray out of a vertical hanging position. The trays 64 are guided and supported in a frame 76 lying within a recess in the frame 2 in such manner that any tray may be removed without disturbing the others. As shown, the upper surface 78 of the frame 76 may be used as a supporting surface for the stock that projects beyond the bed 6.

In order that the machine may be readily accommodated to operators of different heights, an adjustable step or stand 80 is provided having hooks 82 at its ends which engage teeth in racks 84 at the end of the frame 2, one edge of the stand resting against the front of said frame. By engaging the hooks in teeth at different heights, the stand 80 may be adjusted up and down to accommodate it to operators of different heights.

The construction of the means for moving the frame which supports the pressure applying plate or bar 18 into and out of operative position over the bed and of the means which moves the frame toward and away from the bed to cause the plate or bar 18 to perform a pressure applying operation is such that normally the limits of the movements effected by these two means are positively determined. To provide, however, for backlash due to possible wear in the said means, stops are preferably provided which can be adjusted to compensate for such backlash and thereby prevent overthrow of the parts. It is especially desirable to prevent overthrow in the vertical movement of the plate or bar 18 since such overthrow is liable to cause the die to chop up the bed more or less.

In the illustrated construction a stop 86 cast upon the frame 2 has a lateral stop surface with which coöperates an adjustable stop screw 88 and another stop surface upon its upper side with which coöperates an adjustable stop screw 90, the screws 88 and 90 being carried by a cross bar 92 attached to

the rods 20 and 22 of the supporting frame for the plate or bar 18. Adjustment of the screw 88 will compensate for any wear in the cam groove 44 of the cam wheel 42 and adjustment of the screw 90, together with vertical adjustment of the bed 6 will compensate for any wear in the eccentric collar 38 or the eccentric upon the shaft 40.

The operation of the machine is as follows: The parts being in the position shown in full lines in Fig. 2 with the stock exposed so that the operator may readily determine the best portion from which to die out the blank for which a particular die is shaped, the die 8 is laid upon this portion of the stock as shown in Fig. 2 and then the starting levers 58 and 62 are grasped, the lever 58 with the right hand and the lever 62 with the left hand and moved toward each other, thereby clutching the pulley 48 to the shaft 40. As the shaft 40 starts to rotate the cams 42 rotate with it and the parts of the cam grooves 44 which are farthest away from the shaft 40 come into position to receive the cam rolls 46 and thereby turn the frame which supports the pressure applying plate or bar 18 in the sleeves 36 and 32 and bring the plate into operative position over the bed 6. As the plate comes into operative position over the bed 6 and over the die 8, this movement being limited by the engagement of the stop screw 88 with the lateral face of the stop 86 as well as by the engagement of the cam rolls 46 with the other sides of the cam grooves 44, the eccentrics upon the shaft 40 will be turned until the surfaces of greatest eccentricity lie below the shaft 40 and the plate 18 will thus be depressed to strike the die 8 and force it through the stock, an excess of downward movement of the plate 18 being prevented by the engagement of the stop screw 90 with the upper face of the stop 86 in case the eccentric or its collar have become so worn as to permit backlash.

It will be noted that the casting 24 at the left-hand side of the machine as shown in Fig. 1 is located beyond the end of the shaft 40 and therefore does not need to be arched about the shaft. It will be obvious that the castings at each end of the machine may readily be arranged in the same way, although the preferred construction is that here illustrated.

It will be noted that as the plate or bar 18 is swung toward the right in Fig. 2 from its dotted line operative position to its full line inoperative position, a portion of the plate or bar passes through the plane of the pressure receiving surface of the bed 6, whereby it is brought out of shadow-casting relation to said surface. It will be further noted that the construction of the frame which supports the plate or bar 18 is such

that a pressing pull is exerted on each of the four corners of the plate during the pressure applying operation, and that with such a construction rigidity may be obtained even though the parts be made comparatively light. A further advantage of this construction of the frame which supports the plate 18 is that the frame being light may be swung quickly into and out of operative position and without the expenditure of a great amount of power.

Another feature of the construction hereinbefore described which possesses many advantages over constructions before known is the provision of adjusting means for each of the four corners of the bed 6, together with means for simultaneously effecting equal movements of these adjusting means so that the pressure receiving surface of the bed is maintained in planar parallelism throughout the adjusting movement. This adjustment is provided especially for bringing the pressure receiving surface of the block into proper relation to the plate or bar 18 after said block has been planed off to restore the surface, which is usually somewhat roughened by successive dying operations.

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

1. A machine of the class described having, in combination, a bed presenting a surface of considerable area over which stock may be spread for inspection, a die freely movable over said bed, a pressure applying member arranged to be swung into and out of operative position over said bed about an axis below the bed and dimensioned to cooperate with the die wherever located upon the bed, and means for moving said member toward the bed to engage the die and force it through the stock constructed and arranged to insure parallelism of said member and bed throughout the cutting operation.

2. A machine of the class described having, in combination, a bed presenting a surface of considerable area over which stock may be spread for inspection, a die freely movable over said bed, a pressure applying member arranged to be swung into and out of operative position over said bed and dimensioned to cooperate with the die wherever located upon the bed, and automatic means for moving said member into operative position over the bed and for depressing said member to effect a cutting operation constructed and arranged to insure parallelism of said member and bed throughout the cutting operation.

3. A machine of the class described, having, in combination, a bed, a pressure applying member pivotally supported in such manner that it may be swung bodily into and out of operative position over said bed

about a single horizontal axis, and means for depressing the supporting pivots in a right line, when said member is in operative position, to effect a pressure applying operation.

4. A machine of the class described, comprising a stock supporting bed, a pressure applying member having a pressure applying surface substantially coextensive with the pressure receiving surface of said bed, and means rigidly connected with said member and supported below said bed constructed and arranged to carry said member bodily out of operative position over said bed, said means being guided for vertical movement during the pressure applying operation.

5. A machine of the class described, having, in combination, a bed, a pressure applying member movable from a position in which its pressure applying surface is angularly disposed with respect to the pressure receiving surface of the bed into a position in which said surfaces are parallel, and movable toward and away from the bed to effect a pressure applying operation, and means operating when said surfaces are parallel to effect a right line movement of the pressure applying member toward and away from said bed.

6. A machine of the class described, comprising a bed, a pressure-applying member located, when in operative position, above said bed and movable in a right line toward and away from said bed, and a support for said member rigidly connected therewith and arranged to turn about an axis lying below the plane of said bed to carry said member bodily from a position over the bed to a position at one side thereof.

7. A machine of the class described comprising a bed, a die freely movable over said bed, a pressure applying member and means for carrying said member bodily into and out of operative position over said die, supported below said bed and movable with said member in a direction perpendicular to the pressure receiving surface of the bed during the pressure applying operation.

8. A machine of the class described, comprising a bed, a die freely movable over the bed, a pressure applying member dimensioned to cover said die wherever located on the bed, when said member is in operative position over the bed, and means for carrying said member bodily out of operative relation to said die, rigidly connected to said member, supported below said bed and movable in a direction normal to said bed to transmit power to said member to effect the pressure applying operation.

9. A machine of the class described, comprising a bed, a pressure-applying member located when in operative position above

said bed, and movable in a right line toward and away from the bed to effect a pressure-applying operation, a support for the said member rigidly connected therewith and arranged to turn about a horizontal axis below the bed to carry said member out of and into operative position over the bed, and means for effecting the pressure applying operation constructed to depress said horizontal axis in a plane perpendicular to the bed.

10 A machine of the class described, comprising coöperating presser members, one of which is movable about a horizontal axis from a position in which its pressure surface is angularly disposed with respect to the pressure surface of the other member into a position in which said pressure surfaces are parallel, said members being relatively movable when and while said pressure surfaces are parallel to effect a pressing operation, and means, comprising a single shaft, for effecting positively the aforementioned movements.

11. In a machine of the class described, a stock supporting bed which has a length greater than its breadth, a pressure applying member movable into and out of operative position over said bed and dimensioned to cover the cutting surface of the bed when in operative position, supports for said pressure applying member with which it is rigidly connected at its ends, said supports turning about a horizontal axis extending lengthwise of the bed and lying below and substantially midway between the sides of said bed, and means operating through said supports to move said pressure applying member toward and away from the bed when its pressure applying surface is parallel to that of the bed, constructed to depress said horizontal axis in a plane perpendicular to the bed.

12. In a press, a bed, a pressure applying member movable about pivots below the surface of the bed into and out of operative position above said bed, in combination with bearings for said pivots constructed and arranged to be depressed when said member is in operative position for the purpose of causing a pressure applying movement of said member and means outside said bearings for effecting such depression.

13. A machine of the class described, comprising a bed, a pressure-applying member movable laterally of said bed into and out of operative position thereover, a support for said member, bearings in which said support turns about a horizontal axis during the movements of said member into and out of operative relation to its bed, and means for depressing said bearings when said member is in operative relation to its bed to cause it to effect a pressure-applying operation.

14. A machine of the class described, comprising a bed, a pressure-applying member movable bodily into and out of operative relation to said bed, and means for carrying said member into and out of operative relation to said bed, comprising means through which pressure-applying force is transmitted to the four corners of said member.

15. A machine of the class described, comprising a bed, a pressure-applying member arranged to be moved bodily into and out of operative position over said bed, a die freely movable over said bed, and means for applying pressure to said member at its four corners and for depressing said member in a right line whereby the pressure transmitted by it through the die to said bed may be the same in any location of the die upon said bed, said means comprising means for carrying said member into and out of operative position.

16. A machine of the class described, comprising a bed, a pressure-applying member movable bodily into and out of operative relation to said bed, means for supporting said member at its four corners, means for effecting the movements of said member into and out of operative relation to its bed, means for effecting a right line pressure-applying movement of said member when in operative relation to its bed, said last-named two means operating through said supporting means.

17. A machine of the class described, having, in combination, a bed, a pressure applying member, lateral supports for said member rigidly connected therewith and pivoted to turn about a horizontal axis located below said bed and substantially midway between its sides to carry said member into and out of operative position over said bed, said lateral supports comprising rods connected to the pressure applying member at or near its four corners, the rods at each end of said pressure applying member extending in directions coinciding substantially with radii from said horizontal axis, and means for depressing said pivots in such manner that pressure applying force is transmitted equally to each of the four corners of said pressure applying member and that said member is moved in a right line.

18. In a machine of the class described, a bed, a pressure applying member movable into and out of operative position over said bed and movable toward and away from said bed to effect a pressure applying operation, lateral supports for said member rigidly connected to said member at points at or near its corners and pivoted to turn about a horizontal axis located below said bed and substantially midway between its sides, vertical guides for the pivots of said lateral supports and means for depressing

said pivots in said guides when said pressure applying member is in operative position over said bed.

19. A machine of the class described, having, in combination, a bed, a pressure applying member arranged to be swung into and out of operative position over said bed about a horizontal axis located below and substantially midway between the sides of said bed, a driving shaft arranged with its axis in the same vertical plane as said horizontal axis and means mounted on said driving shaft and operated thereby for moving said member into and out of operative position over said bed and for moving said member toward and away from the bed to effect a pressure applying operation, said means being constructed to depress said horizontal axis in said vertical plane.

20. A machine of the class described, having, in combination, a bed, a pressure applying member, lateral supports for said pressure applying member rigidly connected therewith and pivoted to turn about a horizontal axis below said bed to carry said pressure applying member into and out of operative position over said bed, a driving shaft, cams upon said driving shaft for effecting the movement of said pressure applying member into and out of operative position, said lateral supports each comprising a bracket mounted upon said pivot and carrying a cam roll engaging one of said cams, a rod extending from a point at or near one corner of said pressure applying member through an arm of said bracket and being connected to said bracket at a point near said pivot, a second rod extending from another corner of said member through said arm of said bracket and being connected to said arm, said two rods being arranged so that they coincide substantially with radii from said pivot.

21. A machine of the class described, comprising a bed, a pressure applying member, a support for said member pivoted to swing with said member about a horizontal axis, to carry said member into and out of operative position over the bed, means for depressing said pivot in a right line to effect a pressure applying operation when said member and said bed are in operative relation to each other, and means for moving said member positively into and out of operative position over the bed.

22. A machine of the class described, comprising a bed, a pressure applying member, a support for said member pivoted to swing with said member about a horizontal axis to carry said member into and out of operative position over the bed, means for depressing said pivot in a right line to effect a pressure applying operation when said member and said bed are in operative rela-

tion to each other, and automatic means for moving said member positively into and out of operative position over said bed.

23. In a press, a bed, a pressure applying member adapted to be swung bodily into and out of operative relation to said bed about an axis below said bed and supporting means for said member constructed and arranged to cause a pressing movement of said member when in operative position in combination with a constantly rotating part, and means for automatically causing both of the said movements in their proper order by connection with said constantly rotating part.

24. A machine of the class described, comprising a bed, a pressure-applying member movable bodily into and out of operative relation to said bed, means for effecting such movements of said member and means for effecting a right line pressure-applying movement of said member when in operative relation to its bed, said last-named two means being located beneath said bed.

25. A machine of the class described, comprising cooperating pressing members, means for effecting a relative movement of said members to perform a pressing operation, and starting means for said last-named means comprising a plurality of movable members so related to each other that no one member can be manipulated to effect starting of the machine without a manipulation of another member.

26. A machine of the class described, comprising cooperating presser members, means for moving said members toward and away from each other and starting means for said last-named means including a clutch and means for throwing said clutch comprising a plurality of levers and connections whereby one of said levers positions the fulcrum of another in order to render said second lever operative to effect a throw of said clutch.

27. A machine of the class described, comprising a bed and a cooperating pressure-applying member, adjusting means for each corner of said bed and means for simultaneously operating said adjusting means to adjust said bed toward or away from said pressure-applying member.

28. A machine of the class described, comprising a frame, means carried by said frame for pressing a die through stock, a stack of die holding trays carried by said frame, and means for supporting one of said trays in such manner that it presents its contained dies with their outlines toward the operator and all within easy reach.

29. A machine of the class described, comprising a bed for supporting stock, a pressure-applying member movable into and out of operative position over said bed, a case

for holding dies supported beneath said bed, said case constituting also a support for the surplus stock projecting rearwardly beyond said bed.

5 30. A machine of the class described, comprising a bed, a pressure-applying member movable into and out of operative position over said bed and also through the plane of said bed, and means for supporting the surplus stock extending rearwardly beyond said
10 bed away from the sides of the machine and out of the path of said member.

31. A machine of the class described, comprising cooperating presser members, means
15 for moving said members into and out of operative relation to each other in a direction transverse to that of the pressing movement, means for causing said members to perform a pressing operation when in operative
20 relation to each other, and adjustable

means for positively preventing overthrow of said members during the pressing operation.

32. A machine of the class described, comprising a bed, a pressure-applying member
25 movable bodily into and out of operative relation to said bed, means for effecting such movements of said member, means for causing said member to perform a pressure-applying operation when in operative relation
30 to said bed and means for compensating for backlash in said last-named two means.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS A. CASGRAIN.

Witnesses:

H. DORSEY SPENCE,
FREDERICK L. EDMANDS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."