

No. 671,871.

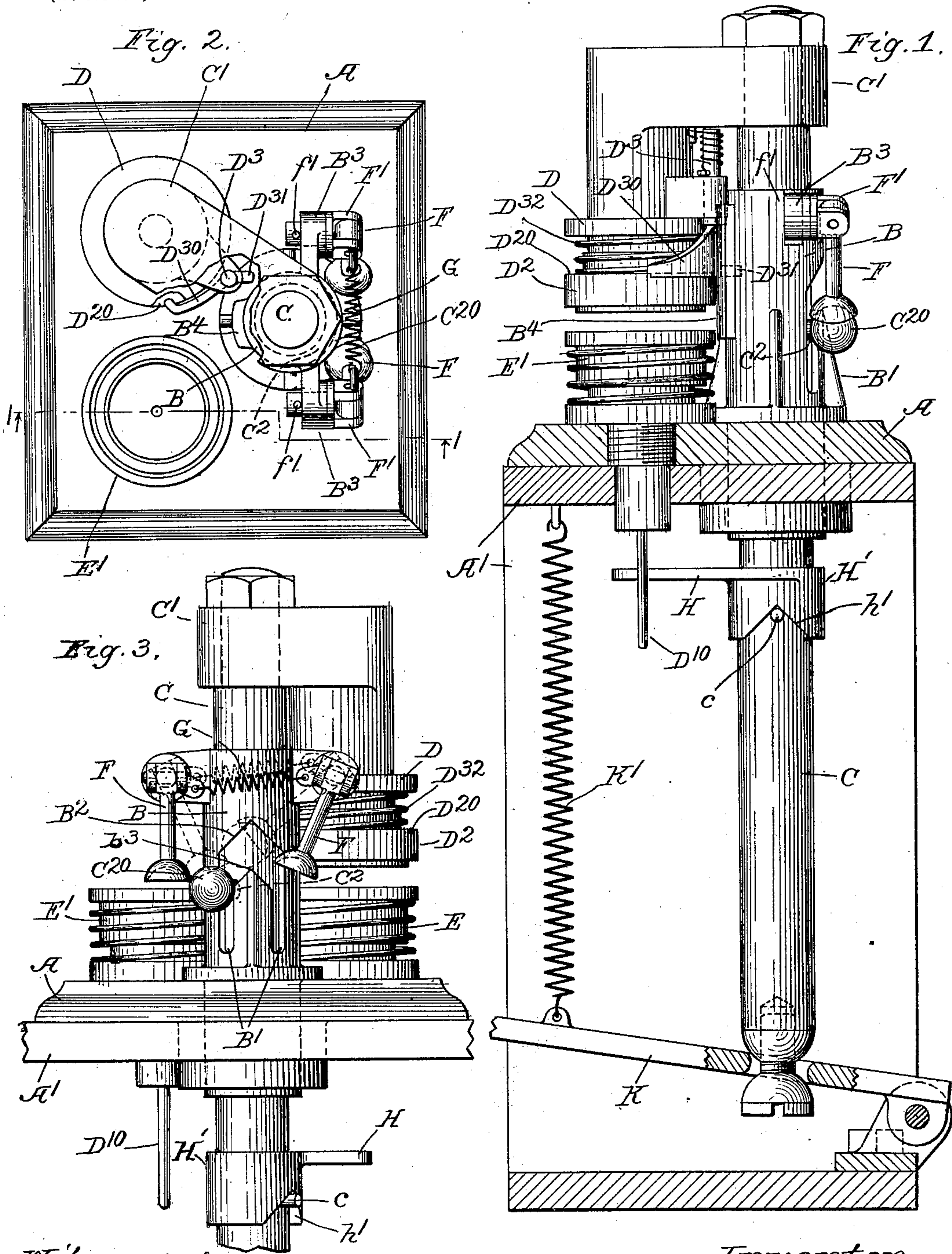
Patented Apr. 9, 1901.

E. W. SILSBY.

DIE PRESS.

(Application filed Nov. 26, 1900.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

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## DIE-PRESS.

SPECIFICATION forming part of Letters Patent No. 671,871, dated April 9, 1901.

Application filed November 26, 1900. Serial No. 37,740. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE W. SILSBY, a citizen of the United States, residing at Lagrange, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Die-Presses, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

10 The purpose of this invention is to produce a simpler construction of a die-press than has been heretofore employed, especially with reference to operations requiring two processes and in presses having for that purpose  
15 two dies on the bed or on the reciprocating head. I have shown the invention in a press with the two dies on the bed; but it will be obvious that it is immaterial which member carries the two dies and which carries the one adapted to coöperate with the two alternately.

20 The invention consists in the features of construction which are specified in the claims.

In the drawings, Figure 1 is a partly-sectional side elevation of my improved press, the  
25 bed and stand being shown in section on line 1 1 on Fig. 2. Fig. 2 is a plan of the same. Fig. 3 is a detail rear elevation, showing the devices for oscillating the reciprocating member.

30 In general my improved press comprises a fixed bed having an upright post through which a vertical shaft reciprocates, such shaft having at the upper end a radial arm which extends out over the post, overhanging the bed,  
35 and carrying a die, the lower end of the shaft below the bed being connected with suitable means for operating it—as, for example, a pedal to depress it, with suitable spring to elevate it. In addition to these general features  
40 it comprises means for oscillating the die-carrying arm attached to the shaft by turning the shaft in its bearing in the post so as to cause it to descend alternately along two paths, so as to coöperate alternately with the  
45 two dies on the bed.

A is the bed of the press.

A' is the supporting-stand.

B is a post erected rigidly from the bed.

50 C is a shaft reciprocating vertically through the post, having at the upper end a short radial arm C', extending out over the post, over-

hanging the bed, and carrying a die, (conventionally represented at D.)

E and E' are two dies on the bed, both at the same distance from the reciprocating  
55 shaft, so that the die D may coöperate with either of them, according to the position in which it is reciprocated.

K is a pedal suitably connected to the shaft below the bed to reciprocate it; K', a spring  
60 which retracts the pedal and the shaft upward. Any suitable means for reciprocating the shaft may be substituted for these familiar elements.

In order to control the path of reciprocation  
65 of the shaft so as to cause the die B to register properly with either the die E or the die E', according to the stage of the work, I make two parallel slots B' B' in the post B, leading into the bearing or chamber about the shaft  
70 C, and I provide the shaft with a rigid stud C<sup>2</sup>, which projects through the bearing and may be engaged in either of the slots and when thus engaged guides the shaft vertically according to the trend of the slot, and  
75 said slots being at their lower portion both vertical the shaft is caused to move with a direct vertical movement during such portion of its reciprocation as is occupied by the necessary coöperation of the dies in perform-  
80 ing their work. Toward the upper part the two slots B' B' merge together, each trending equally toward the other and the aperture continuing as a single slot B<sup>2</sup> for a short distance above the apex b<sup>3</sup> of the metal inter-  
85 vening between the slots at their merger. The extension B<sup>2</sup> of the joined slot is wider than either one, but not necessarily so wide as their sum, for reasons which will be apparent as the description of the coöperating elements  
90 proceeds.

For the purpose of diverting the stud C<sup>2</sup> from the line of either slot along which it rises over toward the line of the other slot, so that it may descend in the latter, and thus be  
95 caused to alternate between the two slots and cause the die carried by the shaft to coöperate alternately with the two dies on the bed, I provide switch devices, consisting of levers F F', which are fulcrumed to the standards and  
100 most conveniently on lugs B<sup>3</sup> B<sup>3</sup>, jutting off from the post B at opposite sides, said fulcrums



being symmetrically disposed with respect to the slots  $B^1 B^2$  and farther apart than said slots, so that the levers when moved to position at which their free ends may overhang the end of the stud as it projects through one slot or the other trend downward toward each other. The stud  $C^2$  terminates in a spherical head  $C^{20}$ , which is wholly outside the post, the neck of the stud—that is, the portion back of such head—being long enough to extend through the shell of the post, and the free ends of the levers  $F F$  are each formed with a spherical cavity or socket adapted to fit the spherical head of the stud. A spring  $G$  is connected to both the levers, connecting them together, the points of attachment of the spring being such that when they are in line with the axes of the lever-pivots the spherical sockets at the ends of the levers, respectively, are in position directly overhanging the path of the spherical knob  $C^{20}$ , which terminates the stud  $C^2$ . The tension of the spring, it will be understood, tends to hold the levers in this position by drawing the two points of attachment of the spring into line with the pivot-axes of the levers, and the action of the spring tends, therefore, to restore the levers to this position whenever they are disturbed therefrom in any direction. It will now be understood that if the shaft has been depressed to cause the die which it carries to register and coöperate with one of the dies on the bed, the stud having in such action traveled down one of the slots  $B^1$  of the post, the return movement of the shaft upward causes the spherical head  $C^{20}$  of the stud  $C^2$  to encounter the end of one of the levers  $F$ , and upon such an encounter, the spherical socket at the end of the lever engaging the stud, the lever will be swung over toward the opposite slots as the shaft and stud continue to rise, and in so doing the stud itself will be forced over toward the other slot, thus rolling or turning the shaft in its bearings. The position of the pivots of the levers and their trend are such that during the upward movement of the shaft, which occurs after the encounter of the stud with either of the levers, the lever will be swung over far enough to carry the stud past the center of the interval between the two slots—that is, over beyond the apex  $b^3$ —so that upon the descent of the shaft the stud will encounter the slope leading from said apex toward the opposite slot from that in which it ascended, and it will be guided over into said opposite slot and will make its next trip downward controlled in its path by such slot, causing the die carried by the shaft to coöperate with the opposite die on the bed. In swinging up to the position described the first lever will have passed over the end of the opposite lever, and the stud in descending will encounter said opposite lever, which will yield aside to allow the stud to pass it in its downward course, the spring  $G$  tending equally to retract the lever when it is thus forced outward as when it is forced

inward by the encounter of the stud in its ascent. When the stud next rises, the operation will be repeated, but in the inverse order, the lever which was encountered during the descent of the stud and forced aside outward being now encountered on the under side and swung inward and operating to carry the stud inward over toward the other slot and above the point of the other lever. Since the stud in passing from side to side in the manner described moves in the arc of a circle about the axis of the shaft, it is necessary to provide a construction which will permit the levers to conform to this path at the same time that they swing inward—that is, each toward the other—to cause the shaft to be thus turned. For this purpose I make the pivotal connection of the levers to the standard by means of a stud  $F'$ , which extends horizontally into the standard and turns therein, being retained by a cotter-pin  $f'$  at the forward side of the lug  $B^3$ , to which the lever is pivoted, and the lever itself is hinged to this stud at the opposite side of the lug, so that it is adapted to swing toward and from the post. This constitutes practically a universal joint and allows the lever to accommodate itself to the curved path of movement of the stud as the latter turns with the shaft. By attaching the spring  $G$  to the levers at a short distance below the pivot of their hinged connection to the studs  $F' F'$ , respectively, the spring is made to operate not only to swing the levers inward toward each other in the manner described and necessary for their functions, but also to swing them inward toward the post, and thus to retract them after they are swung outward from the center of the post by the curvilinear movement of the spherical head of the stud. The same spring thus operates to hold the levers yielding toward each other and to hold them yielding in toward the center of the post.

When a press is employed in the manner here indicated—that is, the article partly formed in the first die being completed in the operation of the second die—such article may require to be ejected from the latter die, and it is desirable to eject it automatically, and dies having this purpose are provided with an element suited to eject the article upwardly. The particular construction of the die or of this ejecting element is not material for my present purpose; but in order to perform this ejecting operation I provide the ejecting element of the die with a downwardly-projecting terminal rod  $D^{10}$ , and on the shaft  $C$ , below the bed, I mount an ejecting-arm  $H$ , having a hub  $H'$ , by which it is carried on the shaft loosely—that is, free both to turn and move longitudinally with respect to the shaft. It is stopped on the shaft by a pin  $c$ , extending through the latter, and the hub has a notch  $h'$ , with sloping sides, in which the pin rests, the arm resting on the pin by gravity and being free to turn about the shaft, but compelled to move upward on the shaft when it is turned by



reason of the sloping sides of the notch  $h'$ , in which the pin  $c$  is engaged. The arm  $H$  has thus a definite position in the plane of its possible rotation about the shaft  $C$ , to which it will return if disturbed only slightly—that is, less than the range of the notch  $h'$ . The position of this arm as thus determined is such that as the shaft descends for coöperation of the upper die with the first of the lower dies the arm  $H$  moves up and down at one side of the ejecting-rod  $D^{10}$  and without action thereon; but as the shaft rises after this first downward movement and the stud  $C^2$  encounters one of the levers and is moved laterally, rotating the shaft, the arm  $H$  is swung over, so that it bears against or stands close to the side of the rod  $D^{10}$ , and as the shaft descends and is further turned in the same direction by the encounter of the stud with the slope of the slot leading from the apex  $b^3$  the arm  $H$  is pressed against the side of the rod, and being restrained thereby and unable to turn farther in that direction the continued turning of the shaft causes the arm to be lifted relatively to the shaft by the coöperation of the pin  $c$  with the slope of the notch  $h'$ , and in such position it continues to move as the shaft descends, sliding down along the side of the rod  $D^{10}$  until it passes below the end of the latter, whereupon by the action of gravity, being free from the lateral restraint of the rod, it returns to its normal position with respect to the shaft, the pin  $c$  reaching beyond the apex of the notch  $h'$ , the arm rotating on the shaft back to its normal position, and in so doing passing under the end of the rod  $D^{10}$ , so that when the shaft rises it encounters the rod and thrusts it upward, ejecting from the die the article formed therein. At the upper limit of this return stroke the turning of the shaft in its bearing in the opposite direction carries the arm  $H$  out from under the end of the rod  $D^{10}$  and permits the lever to regain its normal position.

When this press is used with a die carried by the head, having a yielding member which is to be held unyielding during the coöperation with one of the dies on the head and permitted to yield to coöperate with the other bed-die, having for that purpose a latch which locks the two members together during the first operation and which must be released for the second, I employ an expedient for effecting this change, which I will now describe.

$D^2$  represents a yielding member of the die  $D$ . A latch in the form of a rock-shaft  $D^3$  is pivoted to the unyielding part of said die and has a short lever-arm  $D^{30}$  at the lower end, constituting a nose held in engagement above the shoulder  $D^{20}$  of the yielding member  $D^2$  by a spring  $D^{32}$ , coiled about the rock-shaft and suitably stopped against and on the bearing, thus locking said yielding member rigid with the remainder of the die. A lever-arm  $D^{31}$  at the lower end of the latch-shaft, ex-

tending off toward the post  $B$ , acts as a trip-tail, coöperating with the boss  $B^4$  on the post. This boss is entirely out of the path of the tail  $D^{31}$  when the die  $D$  descends to coöperate with the first die on the bed—that is, the one with which its coöperation requires that the two members of said head-die should be rigid; but as the shaft  $D^3$  is oscillated and the die  $D$  is carried over toward its second position the tail  $D^{31}$ , encountering the boss, causes the latter to be rocked in its vertical bearing and the nose  $D^{30}$  to be disengaged from the shoulder  $D^{20}$  and to be held thus disengaged while the die travels down along its second path, thus leaving the yielding member of the die free to yield upward as may be required for its proper coöperation with the second bed-die. During the return of the head-die to its original position the tail  $D^{31}$  of the latch travels back over the face of the boss  $B$  and running off the same recovers its original position, the nose  $D^{30}$  reëngaging the yielding member  $D^2$  and locking same rigid with the fixed member, making the die ready to descend for coöperation again with the fixed die.

I claim—

1. A die-press, comprising a fixed bed having a shaft-bearing projecting rigidly from it; a shaft journaled in said support and adapted to be turned therein, having at one end of the same a transversely-projecting arm, adapted to carry a die; means for reciprocating the shaft, and for oscillating it in its bearing at the support at the part of its path of reciprocation at which the arm is remote from the bed.

2. A die-press, comprising a fixed bed having a shaft-support projecting rigidly from it; a shaft journaled in such support and adapted to be turned therein, having at one end of the same a transversely-projecting arm adapted to carry a die; means for reciprocating the shaft in its support, and means for automatically oscillating it in its bearing in the support at the part of its path of reciprocation at which the arm is remote from the bed.

3. A die-press, comprising a fixed bed, having a shaft-support projecting rigidly from it; a shaft journaled in the support and adapted to be turned therein, having at one end of the same a transversely-projecting arm adapted to carry a die; means for reciprocating the shaft, and means for turning it in its bearing alternately in opposite directions between consecutive opposite reciprocating movements.

4. A die-press, comprising a fixed bed having a shaft-bearing projecting rigidly from it; a shaft journaled in such bearing, having at one end thereof a transversely-projecting arm adapted to carry a die, in combination with means at the opposite side of the bed from said arm for reciprocating the shaft, and means for oscillating the shaft in its said bearing, between its opposite reciprocating movement at the part of its path of reciprocation at which the die-carrying arm is re-



mote from the bed; whereby the die carried by said arm approaches the bed alternately along two paths.

5. A die-press, comprising a fixed bed having a shaft-bearing projecting rigidly from it; a shaft extending through the shaft-bearing, having above the same an arm overhanging the bed and adapted to carry a die; a pedal carried below the bed to reciprocate it; and means for oscillating the shaft in its bearing between the opposite reciprocating movement at the upper part of its path of reciprocation.

6. A die-press, comprising a fixed bed, having a shaft-bearing projecting from it; a shaft extending through the bearing, having at one end a transversely-projecting arm adapted to carry a die; in combination with means at the opposite side of the bed for reciprocating the shaft, and automatic means for turning the shaft in its bearing alternately in opposite directions between its opposite reciprocating movement.

7. A die-press, comprising a fixed bed, having a shaft-bearing projecting rigidly from it; a shaft extending through the bed, having at one end of the same a transversely-extending arm adapted to carry a die; in combination with means for reciprocating the shaft, and automatic means for turning the shaft in its bearing alternately in opposite directions between its opposite reciprocating movement.

8. A die-press, comprising a fixed bed having a shaft-bearing projecting rigidly from it; a shaft extending through the bearing, having at one end of the same a transversely-projecting arm, and a die carried by said arm, in combination with means at the opposite side of the bed from said arm for reciprocating the shaft, and means for oscillating it in its bearing between its opposite reciprocating movements at the part of its path of reciprocation at which the die-carrying arm is remote from the bed; whereby the die carried by the arm approaches the bed alternately along two paths, two dies on the bed in line respectively with said two paths of approach, one of said dies having an ejecting device provided with a terminal at the opposite side of the bed; an arm carried by the shaft at said opposite side, adapted to cooperate with the terminal to actuate the ejecting device by encountering the said terminal on the stroke of said shaft on which said cooperating arm approaches the bed, one of said cooperating elements being adapted to yield laterally during the opposite stroke along said path.

9. A die-press, comprising a fixed bed having a shaft-bearing projecting rigidly from it; a shaft extending through the bearing, having at one end of the same a transversely-projecting arm and a die carried by the arm; in combination with means at the opposite side of the bed from said arm for reciprocating the shaft; means for oscillating the shaft between its reciprocating movements at the part of the path of reciprocation at which the die-carry-

ing arm is remote from the bed; whereby the die carried by said arm approaches the bed alternately along two paths; two dies on the bed in line respectively with said two paths of approach; one of said dies having an ejecting device provided with a terminal at the opposite side of the bed from the die-carrying arm; an arm carried by the shaft at said opposite side of the bed, adapted to encounter the terminal on the reciprocating stroke of the shaft at which said cooperating arm approaches the bed along one path; said arm being adapted to yield laterally during the opposite reciprocating stroke along said path.

10. A die-press, comprising a fixed bed having a shaft-bearing projecting rigidly from it; a shaft extending through such bearing, having at one end of the same a transversely-projecting arm, and a die carried thereby; in combination with means, at the opposite side of the bed from said arm, for reciprocating the shaft, and means for oscillating the shaft in its bearing between its reciprocating movements, at the part of its path of reciprocation at which the die-carrying arm is remote from the bed, whereby the die carried by said arm approaches the bed alternately along two paths; two dies on the bed in line respectively with said two paths of approach, one of said dies having an ejecting device, provided with a terminal at the side of the bed opposite the die-carrying arm; an arm carried by the shaft at said opposite side of the bed, adapted to encounter the terminal in the stroke in which said last-mentioned arm approaches the bed, said arm being pivotally connected to the shaft; and means for yieldingly holding it in position to encounter the terminal and automatically restoring it to such position when disturbed therefrom.

11. A die-press, comprising a fixed bed, having a rigid shaft-bearing projecting from it, a shaft extending through the bearing and having above the same an arm overhanging the bed and a die carried thereby; in combination with means below the bed for reciprocating the shaft, and means for oscillating it in its bearing between its opposite reciprocating movements at the upper part of its path of reciprocation, whereby the die carried by the arm descends alternately along two paths; two dies on the bed in line respectively with said two paths of descent; one of said dies having an ejecting device, provided with a terminal below the bed; an arm carried by the shaft below the bed, adapted to encounter the terminal on the upstroke along one path, said arm having a hub by which it is pivoted to the shaft, and provided with a sloping notch, the shaft having a pin engaging the notch and supporting the hub, whereby when disturbed from terminal encountering position, said arm is restored by gravity.

12. A die-press, comprising a fixed bed having a shaft-bearing projecting rigidly from it; a shaft extending through the bearing, having at one end of the same a transversely-



projecting arm adapted to carry a die; in combination with means located at the opposite side of the bed from said arm for reciprocating the shaft; the shaft having a stud projecting through the bearing, and the bearing having two slots parallel throughout a portion of their length and merging together at another portion, and affording paths for the stud in the reciprocation of the shaft; and a switch device mounted on the bearing, adapted to be encountered by the stud at the limit of the parallel portions of the slot, to divert the stud from the line of one slot toward that of the other whereby the shaft is turned in its bearing at the portion of its reciprocating movement at which the die-carrying arm is remote from the bed.

13. A die-press, comprising a fixed bed having a shaft-bearing projecting rigidly from it; a shaft extending through the bearing, having at one end of the bearing a transversely-extending arm adapted to carry a die, in combination with means at the opposite side of the bed from said arm for reciprocating the shaft; said shaft having a stud projecting through the bearing; the bearing having two slots parallel throughout a portion of their length and merging together beyond such parallel portions and affording paths for the stud in the reciprocation of the shaft; levers standing in the paths of the stud at the end of the parallel portions of the slots respectively, adapted to be encountered by the stud and swing each toward the other slot as they are actuated by such encounter, whereby the stud is diverted and the shaft is turned in its bearing alternately in opposite directions between its opposite reciprocating strokes.

14. A die-press, whose frame or standard comprises a fixed bed, and a shaft-bearing projecting rigidly therefrom; a shaft extending through such bearing, having at one end thereof a transversely-projecting die-carrying arm; means for reciprocating the shaft in its bearing; a projecting stud on the shaft; means by which the shaft is held non-rotatable throughout the portion of its path of reciprocation at which the die-carrying arm is nearer the bed, and switch devices mounted on the frame, in position to be encountered by the stud, to divert the same laterally and thereby turn the shaft in its bearing at the part of said path at which the die-carrying arm is remote from said bed.

15. A die-press, whose frame or standard comprises a fixed bed and a shaft-bearing projecting rigidly therefrom, a die-carrying shaft adapted to reciprocate in the bearing, and to be turned about its axis therein at the part of its path of reciprocation at which the die is remote from the bed; means for reciprocating such shaft; means controlling its position as to rotation about its axis during the part of its path at which the die is nearer to the bed, adapted to permit it to reciprocate without rotation at either of two positions to which it may be turned at the remote part of

said path, and means for automatically turning it from either to the other of said positions during said remote part of its reciprocation; whereby it is caused to reciprocate alternately in said two positions.

16. A die-press, whose frame or standard comprises a fixed bed, a shaft-bearing projecting rigidly therefrom; a die-carrying shaft, adapted to be reciprocated in said bearing and to be turned about its axis therein at the part of its path of reciprocation at which the die is remote from the bed; means for reciprocating the shaft in the bearing; means for controlling its position as to rotation about its axis during the part of its path at which the die is nearer to the bed, adapted to permit it to be thus reciprocated without rotation, in either of two positions to which it may be turned at the remote part of said path; the shaft having a projecting stud; two switch-levers pivoted to the frame and spring-held at positions respectively adapting them to be encountered by the stud as the shaft moves longitudinally at said two positions respectively in direction carrying the die away from the bed, and to divert the stud and thereby turn the shaft from the position at which such encounter occurs toward the other position, whereby the shaft is caused to reciprocate alternately at said two positions.

17. A die-press, whose frame or standard comprises a fixed bed, and a shaft-bearing projecting rigidly therefrom, a die-carrying shaft adapted to be reciprocated in the bearing, and to be turned about its axis therein at the part of its path of reciprocation at which the die is remote from the bed; means for so reciprocating the shaft; means controlling its position as to rotation about its axis during the part of its path at which the die is nearer the bed, adapted to permit it to be thus reciprocated without rotation at either of two positions to which it may be turned at the said remote part of its path, the shaft having a projecting stud; two switch-levers pivoted to the standard and spring-held at positions respectively adapting them to be encountered by the stud as the shaft in its reciprocation in said two positions respectively moves in direction to carry the die away from the bed, and to divert the stud and thereby turn the shaft from the position at which such encounter occurs toward the other position; the location of the pivots and the relative trend of said levers therefrom at their normal or spring-held positions being such that the encountered end of either lever is diverted to a position beyond the other by the rotation of the shaft which it causes; and each lever being adapted to yield about its pivot to permit the lever to pass it in the return movement of the shaft.

18. In a die-press, comprising a supporting-frame and a reciprocating member, adapted to receive oscillatory movement transverse to the direction of reciprocation to alternate the latter between two paths, means for causing such oscillatory movement, consisting of a



projection on the reciprocating member and two levers pivoted to the frame and spring-held at positions adapting them respectively to be encountered by the projection as the shaft moves in one direction in its reciprocation at said two positions respectively, and by their movement about their pivots divert the stud and thereby turn the reciprocating member from the position at which such encounter occurs toward the other position.

19. In a die-press, comprising a supporting-frame and a reciprocating member adapted to receive an oscillatory movement transverse to the direction of reciprocation to alternate the latter between two paths, means for causing such oscillatory movement, consisting of a projection on the reciprocating member and two levers pivoted to the frame and spring-held at positions adapting them respectively to be encountered by the projections as the reciprocating member moves in one direction in its reciprocation at said two positions respectively, and by their movement about their pivots divert said projections and thereby move the reciprocating member from the position at which such encounter occurs toward the other position; the relative positions of the pivots of said levers and their trend therefrom at their spring-held positions being such as to cause the encountered end of either to swing to the side of the other opposite that at which the encounter occurs, and each being adapted to yield about its pivot to permit the projection to pass in said opposite side.

20. In a die-press, comprising a reciprocating frame and a reciprocating die-carrying member adapted to receive an oscillatory movement transverse to the direction of reciprocation to alternate the latter between two paths, the means for causing such oscillatory movement, consisting of a projection,  $B^2$ , on the reciprocating member, the levers  $F$ ,  $F$ , pivoted to the standard and connected by a spring tending to hold their free ends in position respectively to be encountered by the projection as the reciprocating member makes its return stroke in its reciprocation at said two positions respectively, the relative positions of the pivots of said levers being such as to cause their encountered ends each to swing in beyond the corresponding end of the other, the springs being adapted to permit said levers to yield either way from their spring-held position.

21. A die-press whose frame or standard comprises a fixed bed and a shaft-bearing projecting rigidly therefrom, a shaft adapted to reciprocate in said bearing and to be turned about its axis therein at the part of its path of reciprocation at which the die is remote from the bed; means for reciprocating such shaft in said bearing; means controlling its position as to rotation about its axis during the part of its path of reciprocation at which the die is nearer the bed, to adapt it to reciprocate at either of two positions to

which it may be turned at the said remote part of said path; means for so turning it, comprising two levers having universal-joint connections to the standard at one end, and at the other end having spherically concave terminals; a stud projecting from the shaft, having a spherical terminal knob, adapted to seat in said terminals of the levers, and means holding said levers yieldingly as to movement in any direction at their respective universal joints, with their said concave terminals in position to be encountered respectively by the knobs as the shaft moves in said two paths of reciprocation in direction carrying the die away from the bed.

22. A die-press, whose frame or standard comprises a fixed bed and a shaft-bearing projecting rigidly therefrom, a shaft adapted to reciprocate in said bearing, and to be turned about its axis therein at the part of its path of reciprocation at which the die is remote from the bed; means for reciprocating such shaft in the bearing; means controlling its position as to rotation about its axis during the part of said path at which the die is nearer said bed; means for so turning it, comprising two levers having each universal-joint connection to the standard at one end, and at the other end having spherically concave terminals; a stud projecting from the shaft having a spherical terminal knob adapted to seat in said terminals of the levers, and means holding said levers yieldingly as to movement in any direction at their respective universal joints, with their said concave terminals in position to be encountered respectively by the knob as the shaft moves along its said two paths of reciprocation in direction carrying the die away from the bed, the universal-joint connection of each of said levers to the standard consisting of a stud swiveled in the standard and having the lever hinged to it, and the means for yieldingly holding the said levers as stated, consisting of a spring connecting the two levers at points near their respective hinges, substantially as shown.

23. In a die-press, comprising a supporting-frame and a reciprocating member adapted to receive oscillatory movement transverse to the direction of reciprocation to alternate such reciprocation between two paths, a die carried by such reciprocating member having two elements, one adapted to yield with respect to the other; a latch pivoted to the fixed element, and adapted to engage the yielding element to lock it positively against such yielding; such latch having a tail projecting toward the standard, such standard having a boss in position and form to be encountered by the tail as the die oscillates about the axis of reciprocation, to disengage the latch and hold it disengaged during its reciprocation at the other limit of such oscillation.

24. In a die-press, in combination with a reciprocating head and a die carried thereby, means for moving the head transversely with



respect to its path of reciprocation, and for causing and permitting it to reciprocate at two substantially parallel paths; the die carried by the head having a fixed and a yielding member, and a latch pivoted to the fixed member to engage the yielding member to lock it against yielding, the press-frame having a projection in position to engage the latch during the movement of the die from one path to the other, and by such engage-

ment to disengage the latch to release the yielding member.

In testimony whereof I have hereunto set my hand at Chicago, Illinois, in the presence of two witnesses, this 22d day of November, 15 A. D. 1900.

E. W. SILSBY.

In presence of—

CHAS. S. BURTON,  
ADNA H. BOWEN, Jr.