C. A. FRAHM.

FEEDING DEVICE FOR PRESSES.

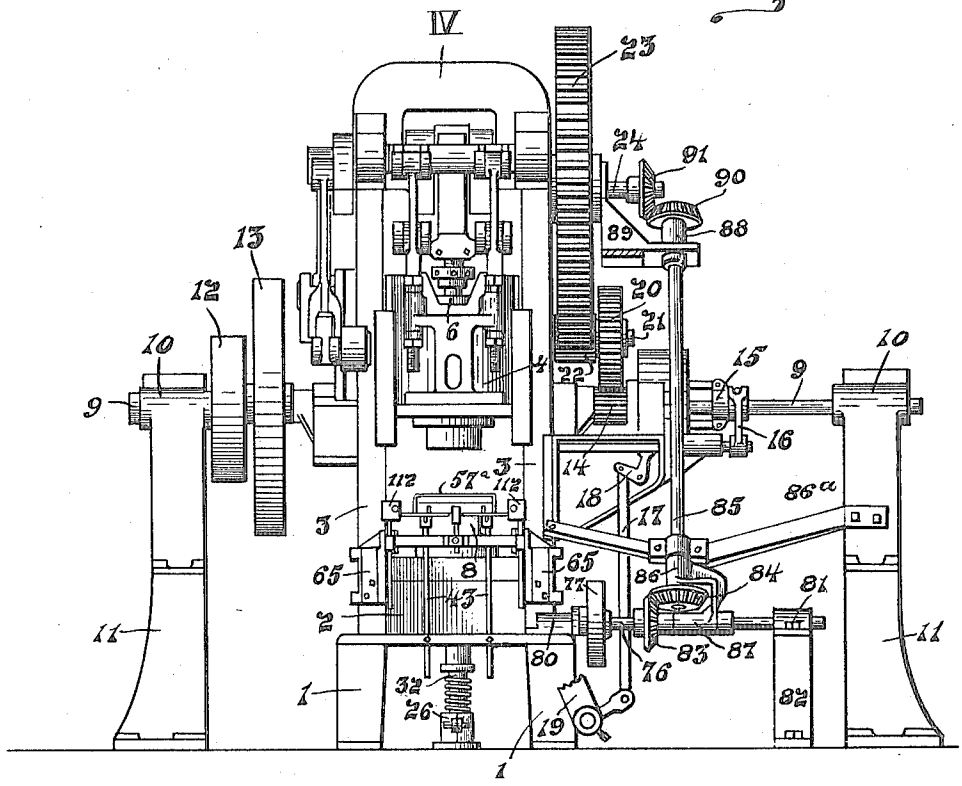
APPLICATION FILED NOV. 15, 1915.

1,207,390.

Patented Dec. 5, 1916.

6 SHEETS—SHEET 1.

Fig. 1.



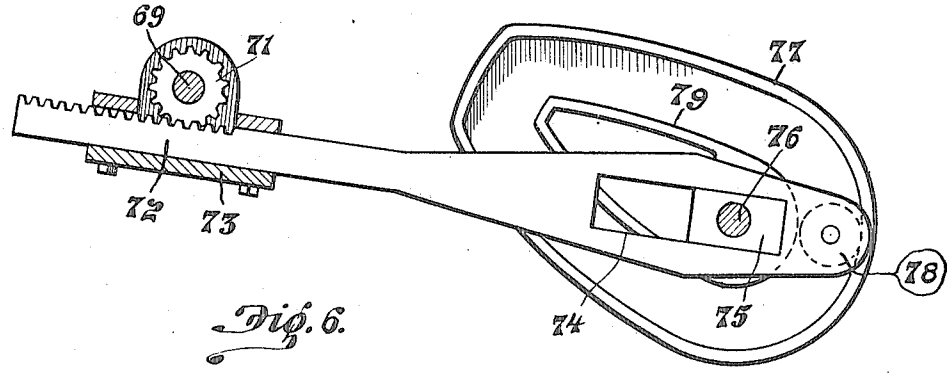


Fig. 6.

Witnesses

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FEEDING DEVICE FOR PRESSES.

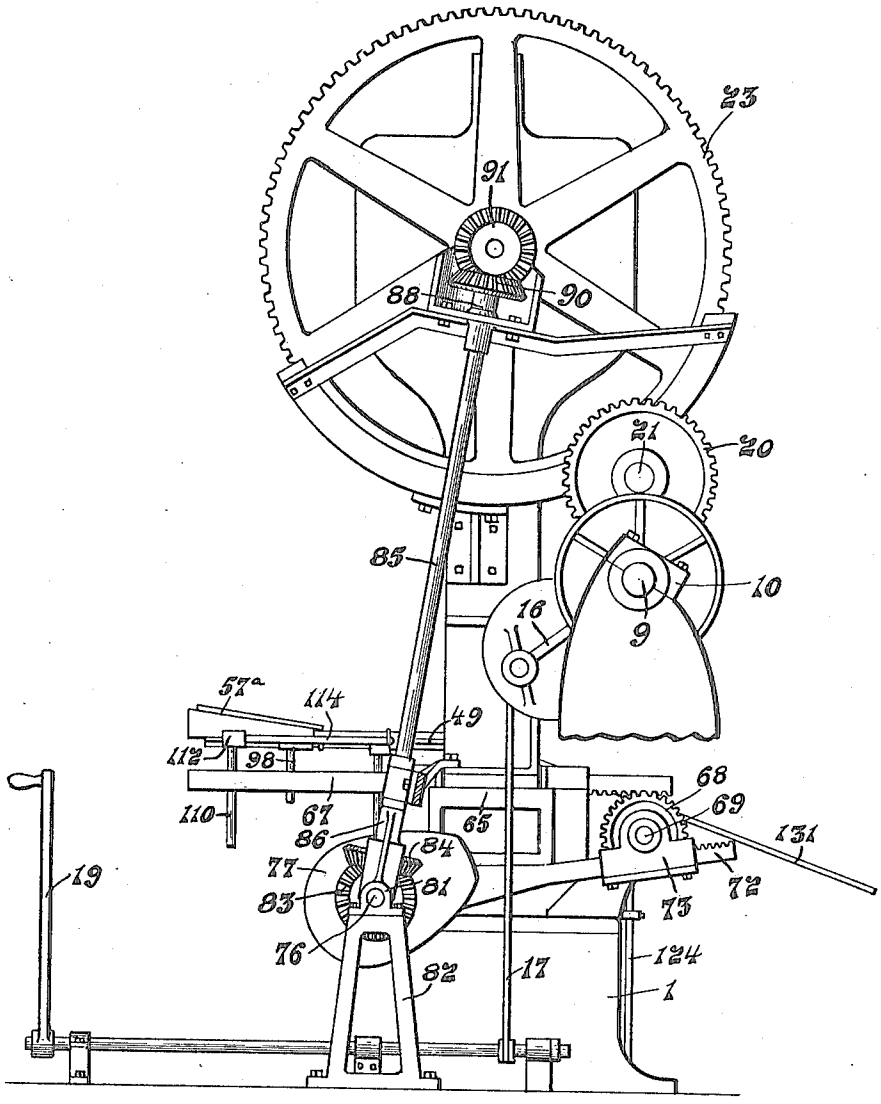
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6 SHEETS—SHEET 2.

Fig. 2.



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6 SHEETS—SHEET 3.

Fig. 3.

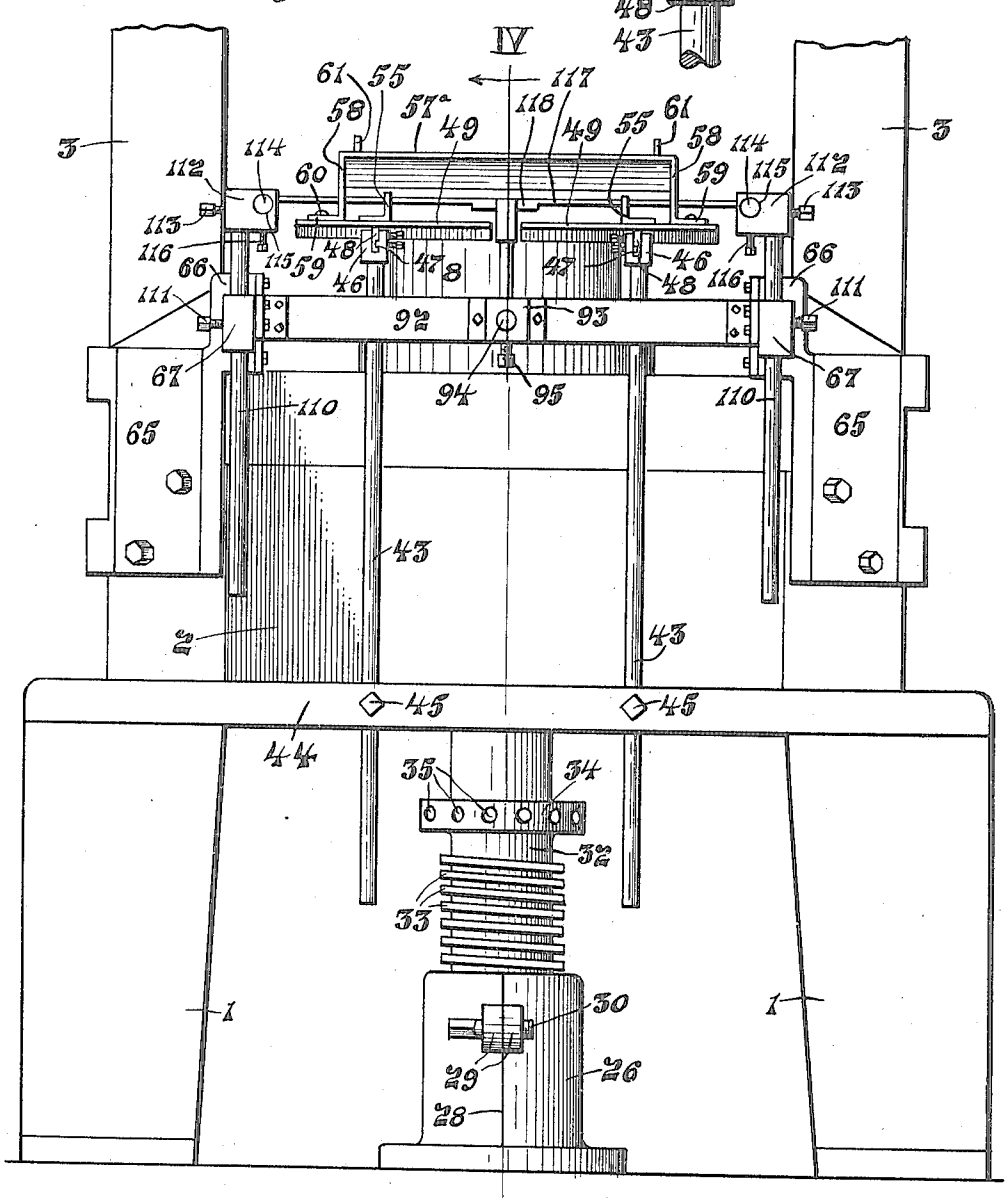
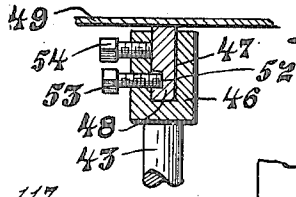


Fig. 11.



Witnesses

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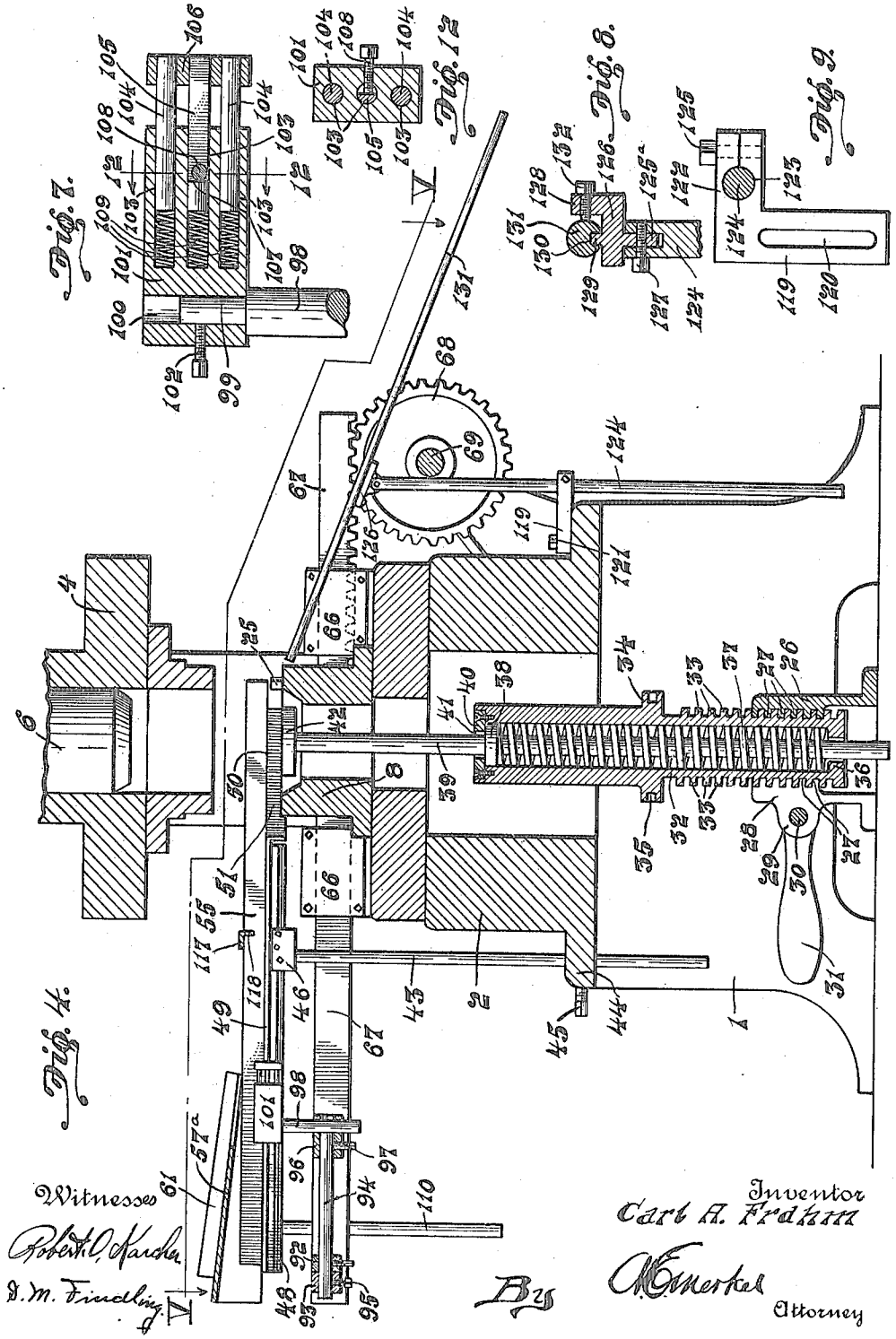
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6 SHEETS—SHEET 4.



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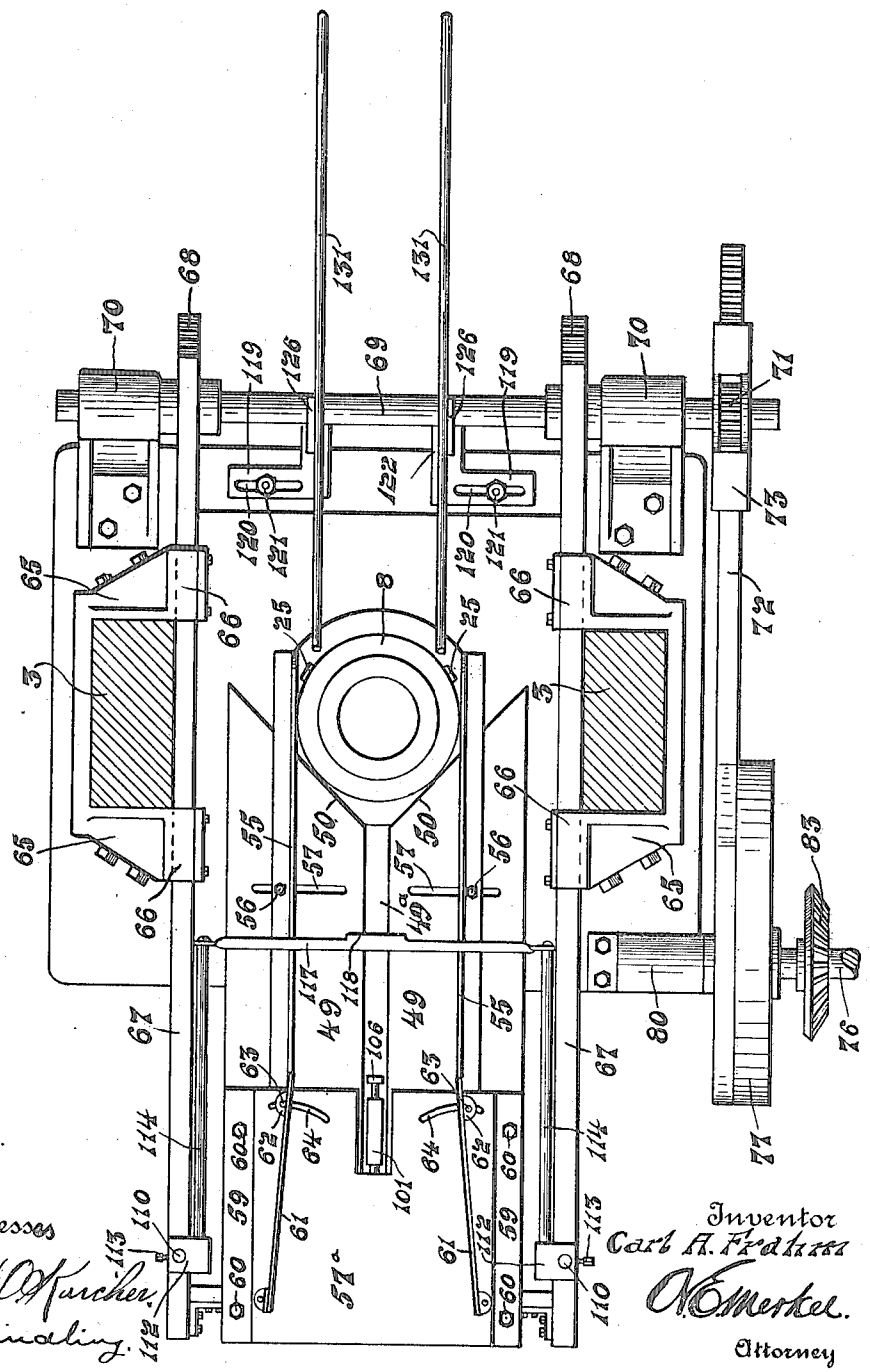
APPLICATION FILED NOV. 15, 1915.

1,207,390.

Patented Dec. 5, 1916.

6 SHEETS—SHEET 5.

Fig. 5.



Witnesses

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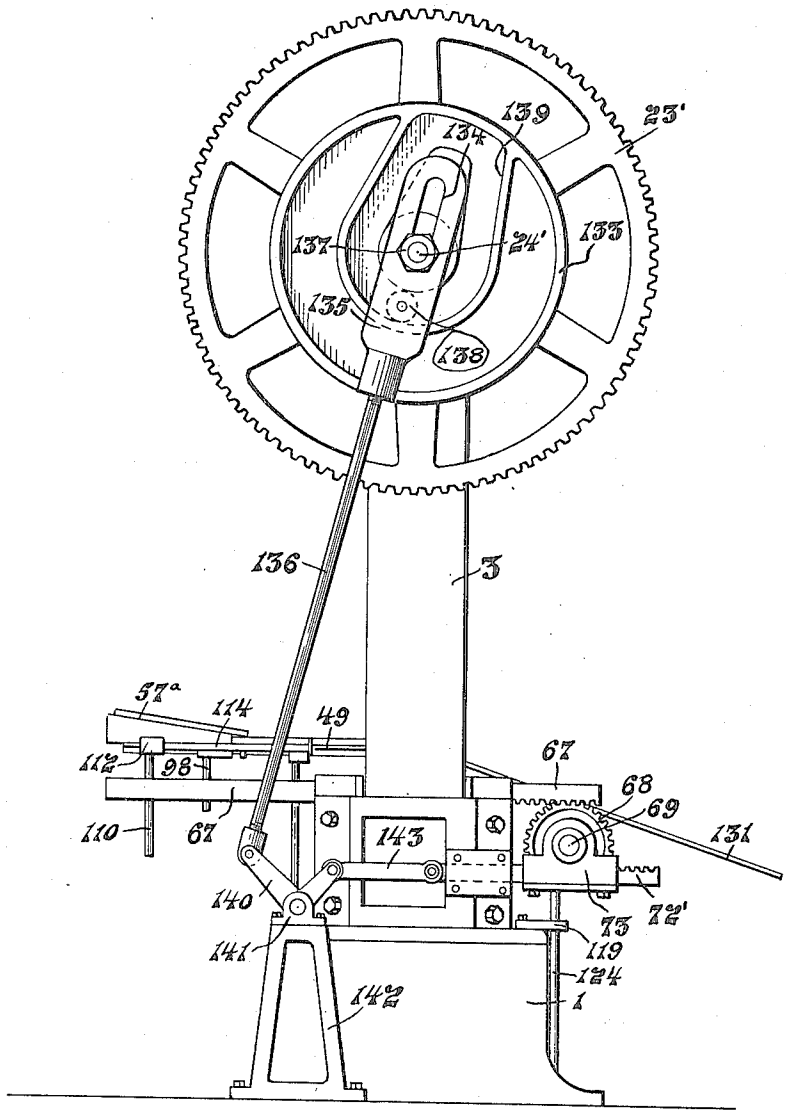
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1,207,390.

Patented Dec. 5, 1916.

6 SHEETS—SHEET 6.

Fig. 10.



Witnesses

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UNITED STATES PATENT OFFICE.

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FEEDING DEVICE FOR PRESSES.

1,207,390. Specification of Letters Patent. Patented Dec. 5, 1916.

Application filed November 15, 1915. Serial No. 61,678.

To all whom it may concern:

Be it known that I, CARL A. FRAHM, a citizen of the United States, resident of Canton, county of Stark, and State of Ohio, have invented a new and useful Improvement in Feeding Devices for Presses, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to feeding devices for presses and has more especial reference to a safety device arranged to be connected to a drawing press or the like, adapted to feed blanks to the latter and remove the finished articles therefrom without the necessity of the operator placing his hands between the die and plunger of the press.

The object of my invention is to provide a feeding device, simple in its construction and efficient in its operation.

The annexed drawings and the following description set forth in detail certain means embodying my invention, the disclosed means, however, constituting but one of various mechanical forms in which the principle of the invention may be employed.

In said annexed drawings:—Figure 1 represents a front elevation of a toggle-operated double acting drawing press provided with my improvement. Fig. 2 represents a side elevation of the same on an enlarged scale. Fig. 3 represents a front elevation of the lower portion of the press showing my improved feeding device upon an enlarged scale. Fig. 4 represents a section on the line IV—IV, Fig. 3. Fig. 5 represents a section on the line V—V, Fig. 4. Fig. 6 represents a detail view showing the cam-actuated mechanism for operating the feeding device. Fig. 7 represents a detail sectional view on an enlarged scale of the reciprocating head which feeds the blanks to the dies. Fig. 8 represents a detail sectional view on an enlarged scale through one of the guide-rods which conveys the finished articles away from the dies and a portion of the operating means therefor. Fig. 9 represents a plan view of one of the brackets on which the guide-rods are secured. Fig. 10 represents a side elevation of a modified form of operating mechanism for the feeding device. Fig. 11 represents a fragmentary sectional view on an enlarged scale of a portion of the feeding table and the upper end of one of the supporting bars therefor. Fig. 12 represents a section on the line XII—XII, Fig. 7.

Similar numerals of reference indicate corresponding parts throughout the several figures of the drawings.

The embodiment of my invention as disclosed by the accompanying drawings, includes the standards 1, 1, upon which is mounted the base 2 of the press, and side-frames 3 supported upon the standards 1, said frames being connected at their upper extremities by the connecting portion of the frame. Slidably mounted between the side frames 3 is the usual head 4 within which is mounted for vertical reciprocation the plunger 6, arranged to engage in the usual manner, the fixed die 8, which is suitably supported upon the base 2. The driving-shaft 9 is journaled in suitable bearings 10, mounted upon the standards 11, and is provided with the usual power-pulley 12 and the fly-wheel 13. A pinion 14 is loosely mounted upon the shaft 9 and arranged to be rotated with said shaft by means of the clutch 15 which is operated by means of the links 16 and 17 and the bell-crank lever 18, a hand lever 19 being provided for the purpose of controlling the operation thereof. The pinion 14 meshes with a gear 20 fixedly mounted upon the short shaft 21, a pinion 22 being also fixedly mounted upon said shaft and meshing with the large gear 23 fixed upon a shaft 24. The latter controls the operation of the head 4 and plunger 6, the head being caused to reciprocate vertically, between the side-frames, and said plunger reciprocating vertically within said head in the usual manner, the customary toggle mechanism, such as shown, being employed for this purpose.

The mechanism above disclosed is of the usual form found in double acting presses of this type, and is only shown for the purpose of illustrating one form of press to which my improved feeding attachment may be applied. In operating presses of the character above-described, it is necessary upon each upward movement of the head and plunger, for the operator to remove the finished article from the lower, or fixed, die with one hand while with the other hand he places the blanks, to be formed by the next operation of the press, upon said die, the stop-pins 25, Figs. 4 and 5 properly positioning such blanks. The operation of re-

moving the finished articles and placing the blanks upon the lower die often results in injury to the operator, and to overcome this difficulty the feeding attachment hereinafter described is provided.

A hollow pedestal 26 is located below and in alinement with the die 8, is provided with internal screw-threads 27 and is split longitudinally at 28, Fig. 4, ears 29 being provided adjacent to the open edges thereof which are internally screw-threaded for the purpose of receiving the screw 30, which latter is provided with a squared end to which may be applied a wrench, or other suitable tool such as indicated by the numeral 31, for the purpose of adjusting the ejector hereinafter described. A member 32 is provided with external screw-threads 33, which engage the internal screw-threads 28 in the pedestal 26 and said tubular member is provided with an integral flange 34 within which is located a series of sockets 35 providing means for the insertion of any suitable implement for rotating the tubular member. An inwardly disposed annular flange 36 is provided at the lower extremity of the tubular member 32 and upon said flange is seated the coil-spring 37, the upper extremity of which engages a collar 38 which is fixed to a rod 39 and is normally held in engagement with a top-plate 40 which is attached to the upper extremity of the tubular member, said plate being provided with a central aperture 41 to accommodate the rod 39. A disk 42 is carried by the upper extremity of the rod 39.

A pair of vertically adjustable supporting rods 43, Figs. 1, 3 and 4, are mounted in suitable apertures in a flange 44 forming part of the base-portion 2 and are held in position by means of set-screws 45. The upper extremities of the rods 43 are provided with integral heads 46, Fig. 4, provided with longitudinal grooves 47, which receive the longitudinally disposed rails 48, said rails being rigidly connected, in any suitable manner, to plates 49 respectively of the feeding table, Fig. 5. The forward edges of the plates 49 are beveled as shown at 50, in order to fit more closely around the die 8 and are provided with downwardly disposed flanges 51 parallel with the beveled edges 50, and the adjacent edges of said plates form a slot 49ª, Fig. 5. Each of the rails 48 is provided in one face with a longitudinal groove 52, Fig. 11, which receives the extremity of a set screw 53 carried by the corresponding head 46 for the purpose of holding the plates 49 in alinement. Set screws 54 are also provided in the heads 46 for the purpose of adjustably securing the rails 48 in the desired position.

For the purpose of guiding the blanks as they pass over the feed-table, a pair of spaced angle-bars 55 are mounted upon the plates 49, Figs. 3 and 5, each of said angle-bars being provided with a bolt 56 which passes through a transverse slot 57 in the corresponding plate 49 for the purpose of adjustably securing said angle bars in the desired position laterally.

An inclined chute is located at the forward extremity of the feed-table and preferably comprises a sheet 57ª of metal provided at each side with down-turned flanges 58, the lower extremities of which are outturned as shown at 59, and connected to the plates 49 by means of screws 60, Figs. 3 and 5. Pivoted near the outer extremity of said inclined chute is a pair of spaced guide-bars 61, Fig. 5, the inner extremities of which are provided with ears 62, which carry bolts 63 passing through segmental grooves 64 for the purpose of adjustably securing the guide bars 61 in the desired position to accommodate the blanks being used upon the press.

A bracket 65 is secured to each of the side-flanges 3, each of said brackets carrying a pair of bearings 66 within each of which is mounted one of the reciprocating rack-bars 67, the latter engaging at their rear extremities with gears 68 which are fixedly mounted upon a shaft 69, journaled in bearings 70 which are carried by the base-portion 2. A pinion 71, Fig. 5, is mounted upon the shaft 69 and meshes with a rack-bar 72 which is slidably mounted in a bearing 73, said bearing being pivotally suspended from the shaft 69. The other extremity of the rack-bar 72 is enlarged, Fig. 6, and provided with a longitudinal slot 74 which receives a sliding block 75 rotatably mounted upon a shaft 76, said shaft also carrying a cam 77. A roller 78 is carried at the extremity of said rack-bar and mounted within a cam-track 79 provided in said cam. One end of the shaft 76 is journaled in a bearing 80 mounted upon the base-portion of the press and the other end in a bearing 81 carried upon a suitable standard 82, a beveled gear 83 being fixedly mounted upon said shaft and engaging a beveled gear 84 mounted upon an upright shaft 85 whose lower end is journaled in a bearing 86 carried upon a bracket 87, the upper extremity of said shaft being journaled in a bearing 88 carried upon a bracket 89 which is supported from the shaft 24. A beveled gear 90 upon the upper extremity of the shaft 85 meshes with a beveled gear 91 carried upon the shaft 24.

The forward extremities of the rack-bars 67, Figs. 3, 4 and 5, are connected by means of a tie-bar 92, the latter carrying intermediately of its extremities a block 93 within which is mounted the extremity of a rod 94, set-screws 95 being provided in said block for adjustably securing said rod. A sleeve 96, Fig. 4, is carried upon the free extremity

of the rod 94 and is adjustably connected thereto by means of a set-screw 97. The sleeve 96 carries a vertical post 98, the upper extremity of which is reduced, as at 99, Fig. 7, said reduced end being mounted within an aperture 100 formed within a block 101, a set-screw 102 securing said block to said post. As shown in Fig. 4, the block 101 projects above the plane of the upper surfaces of plates 49, through slot 49a. The block 101 is furthermore provided with a plurality of horizontally disposed sockets 103 within which are slidably mounted rods 104 and 105 which carry the yielding end-piece 106. The intermediate rod 105 is half round throughout a considerable portion of its length and is provided with a shoulder 107 near its inner extremity, and is arranged to engage a stop-screw 108 limiting the forward movement of the member 106, springs 109 being provided in the sockets 103 for the purpose of normally holding said member in the position shown in Fig. 7 of the drawings. The block 101 and its attached parts form the feeding-member proper and operates in a manner hereinafter fully described.

A pair of upright posts 110, Fig. 3, are adjustably mounted in apertures near the forward extremities of the rack-bars 67 and are adjustably secured in position by means of set-screws 111, each of said posts carrying at its upper extremity, a block 112, such post passing through a suitable aperture in the block and being adjustably secured therein by means of a set-screw 113. One of the horizontally disposed rods 114 passes through a suitable aperture 115 in each of the blocks 112 and is adjustably secured therein by means of a set-screw 116, said rods being connected at their free extremities by means of a tie-bar 117, Fig. 5, which is provided intermediately of its extremities with a downwardly depending lip 118, Fig. 4, arranged to engage the finished product and discharge same from the press, as will be further described.

A pair of L-shaped brackets 119 are spaced from each other at the rear of the base of the press, Fig. 5, each of which is provided with an elongated slot 120 through which is passed an adjusting-screw 121, which secures said bracket to the base. The rearwardly extending arm 122 of each bracket is split, Fig. 9, and is provided with an aperture 123 through which passes a post 124, a screw 125 being passed through the split portion of the bracket for the purpose of adjustably securing said post. The upper extremity of each post is bifurcated and receives the downwardly disposed lip 125a formed upon the accompanying bracket 126, a screw 127 passing through said bifurcated portion and through said lip for the purpose of holding said bracket at any desired angle. Each of the brackets 126 is provided along one edge with an up-turned flange 128 and a centrally disposed relatively short flange 129, said centrally disposed flange receiving the longitudinal groove 130 provided in a guide-rod 131, a set-screw 132 passing through said up-turned flange and bearing against said guide-rod for the purpose of securing said rod to said bracket.

The above-described mechanism operates as follows: When the clutch 15 is operated, the head 4 of the press will be caused to reciprocate at intervals in the usual manner, the plunger 6 reciprocating within said head and co-acting with the fixed die 8. The blanks from which the articles are fashioned in this case are shown to consist of circular metal sheets which are thrown upon the inclined chute 57 and, being guided between the guide-bars 61, are properly centered and deposited upon the feeding table between the angle irons 55. As the shaft 76 is being continually rotated by means of the beveled gearing above described, the cam 77 mounted on said shaft will cause the rack-bar 72 to reciprocate, thereby oscillating the shaft 69. The gears 68 mounted upon said shaft 69 will similarly reciprocate the rack-bars 67 and the parts carried thereby. As the blanks are deposited upon the feeding table from the inclined chute as above described, the feeding-head 101 will with each reciprocation carry said blanks forward and deposit same upon the lower die 8, the stop-pins 25 and flanges 51 positioning the blanks properly upon said die. At this time the head 4 will descend upon the die 8, holding the blank in position thereon and the plunger 6 will then move downwardly, the plunger co-acting with said die and stamping the blanks into the proper form, and forcing the rod 39 and disk 42 carried thereby downwardly against the pressure of the spring 37. As the plunger 6 and head 4 rise into the position shown in Fig. 4, the spring 37 will instantly raise the rod 39, thus ejecting the stamped article, which is carried upon the disk 42, from the die 8. Upon the last operation of the rack-bars 87 the lip 118, carried upon the tie-bar 117 will strike the stamped article and push it clear of the die 8 and upon the guide-bars 131, which will convey the article from the press at the same time that the feeding-head feeds a new blank to the die 8. By providing the yielding member 106, the blanks may be properly positioned upon the die 8, contacting with the stop-pins 25 without causing any shock to the feeding device and eliminating the danger of bending the blanks.

From the above-described construction it will be noted that the feeding mechanism is so arranged that it may be adjusted to meet varying conditions as to size of blanks and height of die 8. That is, it will be noted that the angle irons 55 may be ad-

justed toward and from each other, the plates 49 may be adjusted vertically to bring them into alinement with the top of the die block of the die 8, the feeding rod 94 may be adjusted forwardly and back, the plates 49 may be also adjusted forwardly or back and the rods 114 may be adjusted in a similar direction. In addition the rods 110 may be raised or lowered so that the position of the ejector lip 118 may be adjusted in a similar direction.

In Fig. 10 is shown a modified form of driving mechanism for the feeding device. In this form the large gear 23′ is provided with an integral cam wheel 133. The extremity of the shaft 24′ receives the elongated slot 134 of the head 135 which is connected to the upper extremity of the rod 136, a nut 137 being provided upon said shaft for the purpose of retaining said head upon the shaft. A roller 138 is carried by the head 135 and travels in the cam-track 139 formed upon the cam. The rear extremity of the rod 136 is pivotally connected to a bell-crank lever 140, said lever being pivotally mounted upon a bearing 141 carried by a bracket 142, a link 143 connecting said bell-crank lever with the rack-bar 72′. The rest of the mechanism is identical with that above described.

Having fully described by invention, what I claim and desire to secure by Letters Patent is:—

1. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks thereon; said feed-table being adjustable in a direction transverse with respect to the direction of feed movement.

2. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table being adjustable in the direction of feeding movement.

3. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table being adjustable in the direction of feeding movement and also in a direction transverse with respect to said direction of feeding movement.

4. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table being provided with laterally adjustable guide-members and being adjustable in a direction transverse with respect to the direction of feeding movement.

5. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table being provided with laterally adjustable guide-members and being adjustable in a direction transverse with respect to the direction of feeding movement; said feed-table also being adjustable in the direction of feeding movement.

6. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table being provided with laterally adjustable guide-members and being adjustable in a direction transverse with respect to the direction of feeding movement; said engaging-means being adjustable in the direction of feeding movement and also in a direction transverse with respect to such direction of movement.

7. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said means being adjustable in a direction transverse with respect to the direction of feeding movement.

8. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said means being adjustable in the direction of the feeding movement.

9. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said means being adjustable in a direction transverse with respect to the direction of feeding movement and also in the direction of such movement.

10. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table being provided with laterally adjustable guide-members, and said engaging means being adjustable in a direction transverse with respect to the direction of feeding movement.

11. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table being provided with laterally adjustable guide-members; said engaging means being adjustable in the direction of feeding movement.

12. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon, said feed-table being provided with laterally adjustable guide-members; said engaging means being adjustable in a direction transverse with respect to the direction of feeding movement and also in the direction of such movement.

13. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table being adjustable in a direction transverse with respect to the direction of feeding movement and said engaging means being also adjustable in said direction.

14. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table being adjustable in a direction transverse with respect to the direction of feeding movement and said engaging means being adjustable in the direction of such feeding movement.

15. An automatic feeding device for metal-working presses, comprising the combination of a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said feed-table and said engaging means being adjustable in the direction of feeding movement.

16. An automatic feeding device for metal-working presses, comprising the combination with a feed table; of means operating in connection with the latter for engaging the blanks placed thereon; said feed-table and engaging means both being adjustable in a direction transverse with respect to the direction of feeding movement and also adjustable in such direction.

17. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon said table terminating adjacent to the forming die of said members and having its terminal portion formed with angularly disposed edges.

18. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said table terminating adjacent to the forming die of said members and having its terminal portion formed with angularly disposed flanges.

19. An automatic feeding device for metal-working presses, comprising the combination with a feed-table; of means operating in connection with the latter for engaging blanks placed thereon; said table terminating adjacent to the forming die of said members and having its terminal portion formed with angularly disposed and downwardly projecting flanges.

20. An automatic feeding and discharging device for metal-working presses, comprising the combination of a feed-table; means operating in connection with the latter for engaging blanks placed thereon; and means for discharging the finished article and connected with said first-named means; said last-named means being adjustable in the direction of feeding movement.

21. An automatic feeding and discharging device for metal-working presses, comprising the combination of a feed-table; means operating in connection with the latter for engaging blanks placed thereon; and means for discharging the finished article and connected with said first-named means; said last-named means being adjustable transversely with respect to said feeding movement.

22. An automatic feeding and discharging device for metal-working presses, comprising the combination of a feed-table; means operating in connection with the latter for engaging blanks placed thereon; and means for discharging the finished article and connected with said first-named means; said last-named means being adjustable both in the direction of feeding movement and in a direction transverse with relation thereto.

23. In an automatic feeding device for metal working presses, the combination with a feed-table; of an inclined chute adjacent thereto and provided with laterally placed guiding members; said feed-table also provided with laterally placed guiding members registering with the lower ends of the guiding members of said inclined chute.

24. In an automatic feeding device for metal working presses, the combination with a feed-table provided with laterally adjustable guiding members; of an inclined chute adjacent to said feed-table and provided with laterally adjustable guiding members, whereby the lower ends of the latter may be caused to register with the guiding-members of said feed-table.

25. In an automatic feeding device for metal working presses, the combination of a feed-table provided with a central slot; an inclined chute adjacent thereto and provided with laterally placed guiding members; said feed-table being also provided with laterally placed guiding members; and reciprocating feeding means projecting through said slot.

26. In an automatic feeding device for metal working presses, the combination with

a feed-table provided with laterally adjustable guiding members; of an inclined chute adjacent to said feed-table and also provided with guiding members, the latter being angularly adjustable, whereby their lower ends may be caused to register with the guiding members of said feed-table.

27. In an automatic feeding device for metal working presses, the combination with a feed-table provided with laterally adjustable guiding members; of an inclined chute adjacent to said feed-table and provided with laterally placed guiding members pivoted at their upper ends and adjustably securable at their lower ends.

28. In an automatic feeding device for metal-working presses, the combination with a feed-table provided with laterally placed adjustable guiding-members extending in the direction of feed; of an inclined chute adjacent to such table and provided with laterally placed guiding-members also extending in the direction of feeding movement, said last-named guiding-members being pivoted at their upper ends and adjustably secured at their lower ends.

29. In an automatic feeding device for metal working presses, the combination with a feed-table, of a reciprocating feeding member having an engaging end portion adapted to yield in the direction of feed.

30. The combination with a metal-working press, provided with a fixed die and a vertically reciprocable plunger coöperating therewith; a feed-table adjacent to such fixed die; a movable feeding member operating in connection with said table for carrying metal blanks to said fixed die; a pair of horizontally movable rack-bars mounted upon said members, said feeding member being connected with said rack-bar; a discharging member connected with said rack-bars; and mechanism for effecting the coordinate movement of said reciprocating plunger and said rack-bars.

Signed by me, this 6th day of November, 1915.

CARL A. FRAHM.

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