E. H. VOGEL.

METAL STAMPING PRESS.

APPLICATION FILED SEPT. 28, 1910.

993,916.

Patented May 30, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

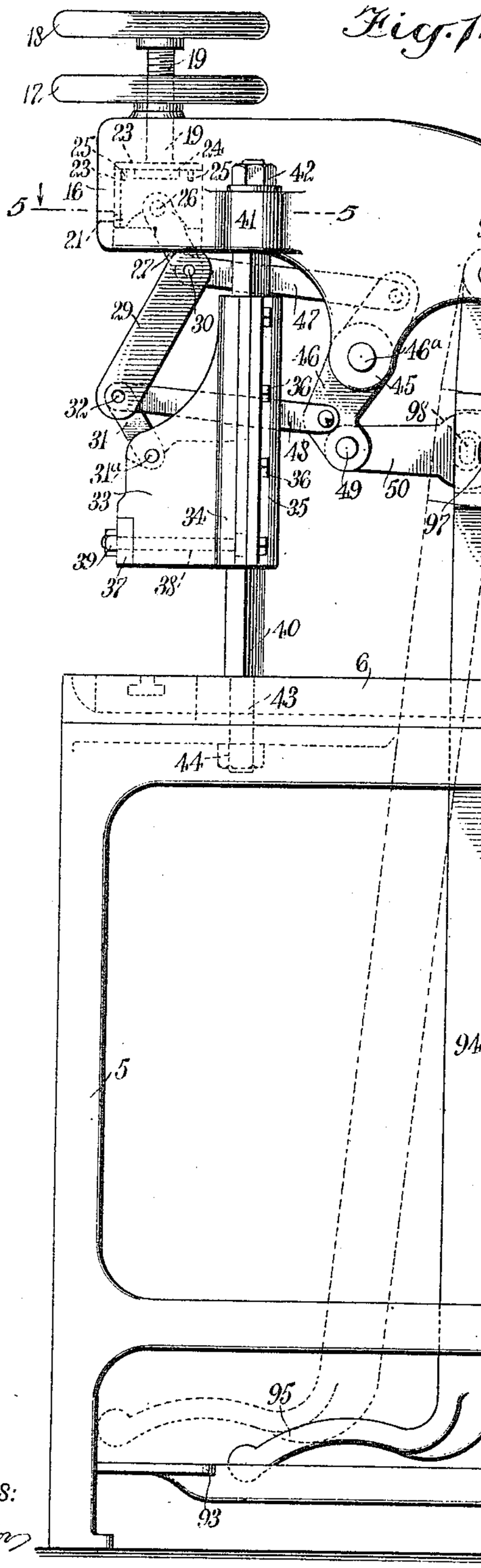
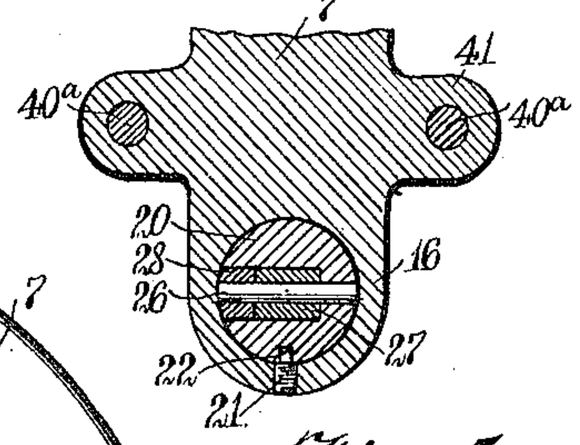


Fig. 5.



WITNESSES:

Geo. W. Naylor

Walton Harrison.

INVENTOR

Ernest H. Vogel

BY Munn & Co

ATTORNEYS

THE NORRIS PETERS CO., WASHINGTON, D. C.

E. H. VOGEL.

METAL STAMPING PRESS.

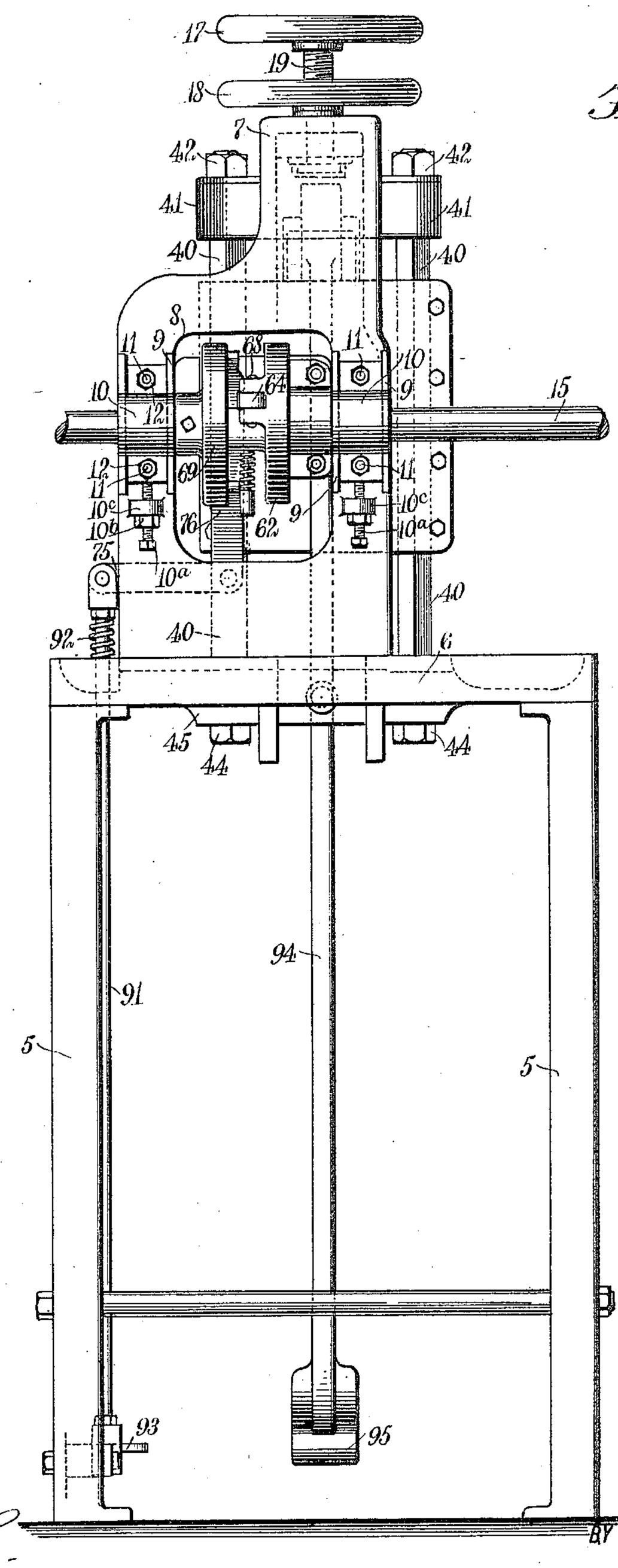
APPLICATION FILED SEPT. 28, 1910.

993,916.

Patented May 30, 1911.

3 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

Geo. W. Maybee

Walton Harrison

INVENTOR

Ernest H. Vogel

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., WASHINGTON, D. C.

E. H. VOGEL.

METAL STAMPING PRESS.

APPLICATION FILED SEPT. 28, 1910.

993,916.

Patented May 30, 1911.

3 SHEETS—SHEET 3.

Fig. 3.

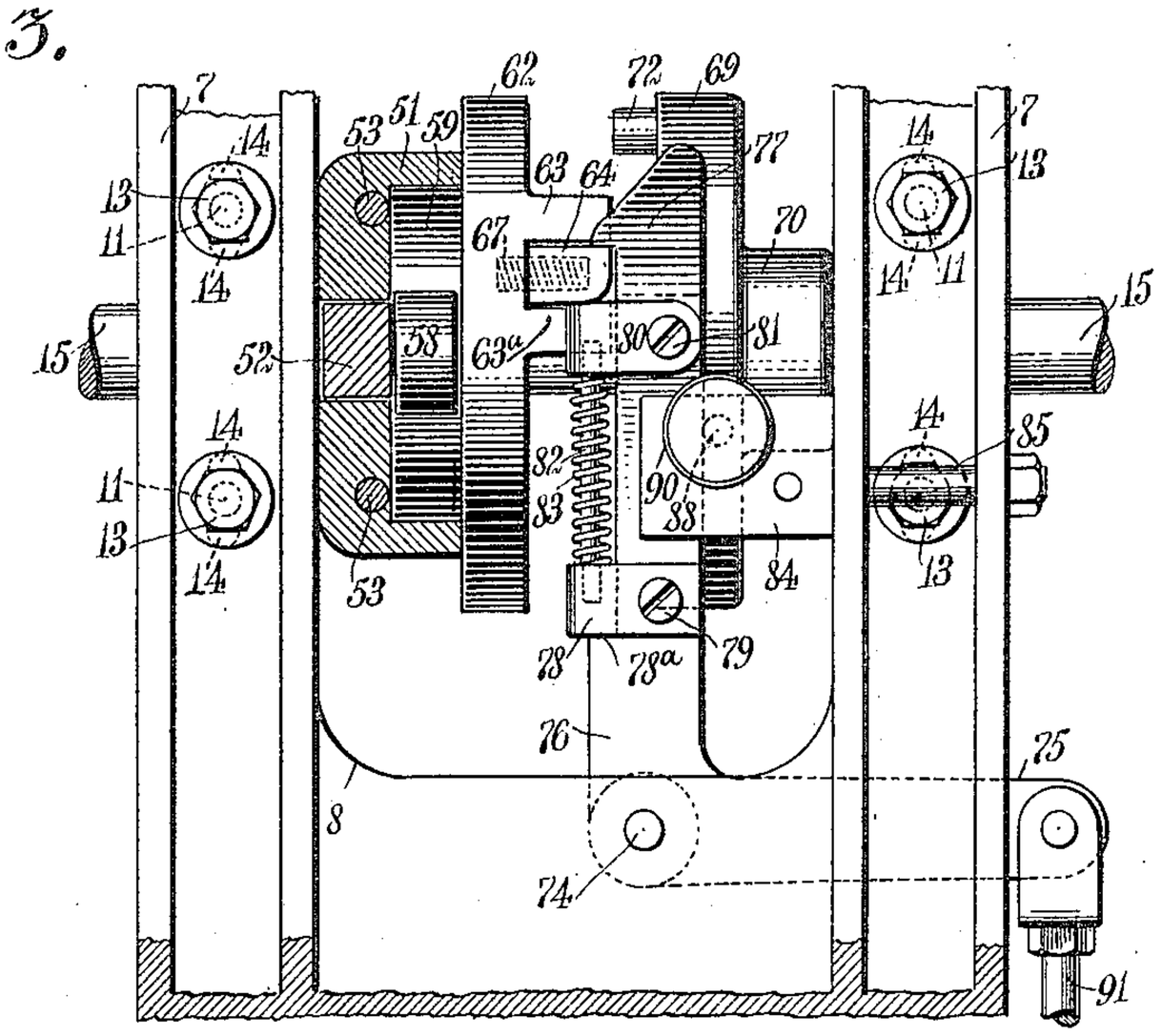
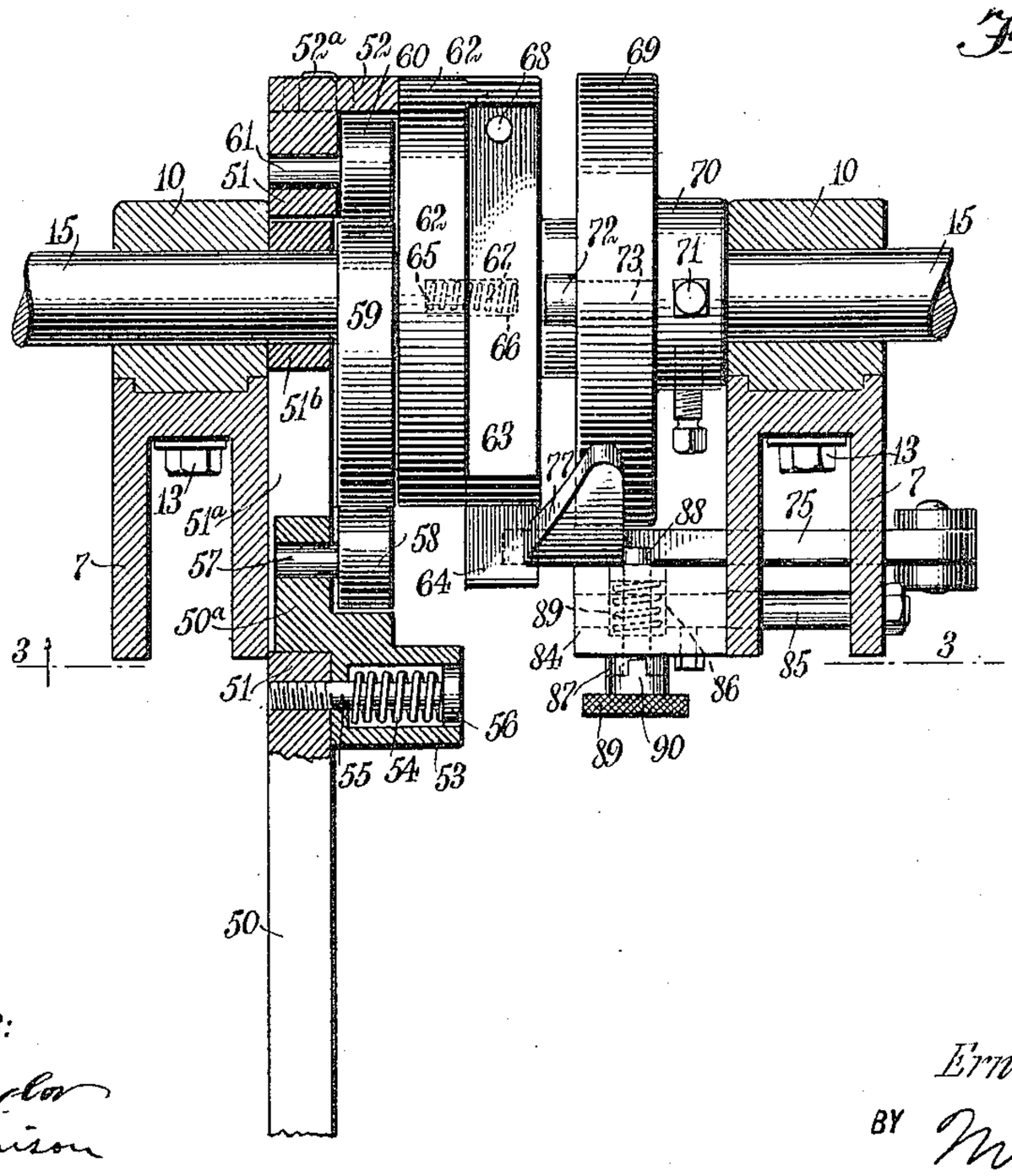


Fig. 4.



WITNESSES:

Geo. W. Naylor

Walton Harrison

INVENTOR

Ernest H. Vogel

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ERNEST HENRY VOGEL, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO CONRAD MARX, OF NEW YORK, N. Y.

METAL-STAMPING PRESS.

993,916. Specification of Letters Patent. **Patented May 30, 1911.**

Application filed September 28, 1910. Serial No. 584,368.

To all whom it may concern:

Be it known that I, ERNEST H. VOGEL, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Metal-Stamping Press, of which the following is a full, clear, and exact description.

My invention relates to metal stamping presses—that is, to presses of the kind used for stamping and performing analogous operations, such as punching, shearing, bending and the like, my more particular purpose being to provide improved mechanism for increasing the efficiency of the machine, while at the same time promoting simplicity of operation and cheapness of manufacture of the different parts employed.

More particularly stated, my invention comprehends a number of specific improvements, among which are the following: I. To provide the press with double-acting toggle mechanism of approved construction, whereby, without increasing the size of the press, a comparatively long stroke of the movable die member is secured. II. To provide improved mechanism for shifting the control of the press, so that it may be actuated either manually or by power, as desired. III. To provide an improved clutch to be used when the machine is operated by power and controllable by a simple movement of a foot lever for actuating the toggle mechanism in order to cause the movable die to give a definite thrust. IV. To provide various mechanical parts whereby the general efficiency of the machine is improved in various ways.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation, showing my stamping press complete; Fig. 2 is a rear elevation of the press—that is, showing the press as it would be seen by a person standing at the right of Fig. 1; Fig. 3 is an enlarged fragmentary view, partly in front elevation and partly in section, on the line 3—3 of Fig. 4 looking in the direction of the arrow; Fig. 4 is a fragmentary view, partly in horizontal section and partly in plan, of the parts appearing in Fig. 3; and Fig. 5 is an enlarged horizontal section on the line 5—5 of Fig. 1, looking in the direction of the arrow.

Mounted upon a framework 5 is a metallic plate 6, these parts together forming practically a heavy table. Mounted rigidly upon the back of the table 6 and extending backwardly and forwardly therefrom is a large support 7 having generally the form of a half arch made of strong metal and provided with an opening 8 to facilitate the accessibility of various parts by the support 7.

At 10 are bearings which are mounted upon opposite sides of the opening 8, as will be understood from Fig. 2. These bearings are disposed between stationary guides 9 and are held in position by aid of bolts 11 which are provided with nuts 12 and with heads 13 (contrast Figs. 2 and 3), these bolts extending through slots 14 by aid whereof the bearings may receive a slight vertical adjustment. To facilitate in making this adjustment, I provide adjusting bolts 10^a and 10^b, the bolts extending through ears 10^c which are threaded internally for this purpose.

Extending through the bearings 10 and supported thereby is the main shaft 15 by aid whereof power is supplied to the machine. It will be understood, of course, that there may be a number of these machines each with its shaft 15, all driven from a single source of power, and that in connecting up such number of machines the latter are properly balanced in accordance with well known engineering principles.

The support 7 is provided with a hollow extremity 16 (see Figs. 1 and 5) and over this hollow extremity are mounted two hand wheels 17, 18. The wheel 18 is provided with a threaded stem 19 and the wheel 17 is revolubly mounted upon the stem 19 forming practically a nut lock for the same. By turning the wheel 17 a portion of a revolution, the threaded stem 19 is locked firmly so as to hold it in a predetermined position. By turning the hand wheel 17 slightly backward, the stem 19 is threaded and may be turned by aid of the hand wheel 18.

A head 20, having a substantially cylindrical form, is mounted within the hollow

extremity 16 and by aid of a guide bolt 21 is prevented from turning therein. This guide bolt is provided with a square portion 22 serving as a spline and extending into a vertical groove 23. The threaded stem 19 is provided at its lower end with a head 24 which extends through a collar 25, the latter being connected with the head 20, the parts thus forming a swivel joint. By turning the wheel 18 so as to raise or lower the stem 19 as it rotates, the head 20 is raised or lowered accordingly and this being done the stem 19 is locked by aid of the hand wheel 17, as above described. The head 20 carries a pin 26 and journaled upon the latter is a link 27 which is held in place by a nut 28 (see Fig. 5). These parts are thus arranged to facilitate the removal and replacement of the link 27. This link is connected with another link 29 by aid of a pivot pin 30 and below the link 29 is a link 31 which is connected with it by aid of a pin 32. The link 31 is connected by a pivot pin 31[a] with a sliding head 33. This sliding head is provided with half boxes 34 and 35 held together by aid of bolts 36. The head 33 carries a bit holder 37, a bolt 38 extending through the bit holder and a nut 39 for actuating the bit holder in order to secure a bit in position upon the head 33. As many different types of bit holder may be employed, I do not deem it necessary to describe this part in detail.

The head 33 carries two bearings made up of the half boxes 34, 35, and these two bearings slidably engage two guide rods 40 which are square in cross section and are disposed vertically. The rods 40 are provided at their upper ends with reduced portions 40[a] which extend through two ears 41 and are fitted with nuts 42. Similarly the lower ends of the guide rods 40 are provided with reduced portions 43 which extend through a thickened portion 45 of the table 6 (see Fig. 2) and are secured by aid of nuts 44. A lever 46 is journaled upon a pin 46[a] carried by the support 7, as will be understood from Fig. 1. Pivotally connected with the upper end of the lever 46 is a link 47. Below this link is another link 48, also pivotally connected with the lever 46.

The lower end of the lever 46 carries a pin 49 and pivotally connected with the latter is an arm 50. This arm has a wide portion 51 which is provided with a slot 51[a]. Disposed within this slot is a guide block 51[b] which is journaled upon the shaft 15 and which supports the arm 50 while allowing it freedom to slide in the general direction of its own length. The side portion 51 of the arm 50 carries a plate 52 secured rigidly to it by aid of bolts 52[a]. The arm 50 carries a sleeve 53 which is provided with a base portion 50[a] fitting slidably into the slot 51[a]. A spiral spring 54 is disposed within the sleeve 53 and extending through this spring is a pin 55 having a head 56, the latter being engaged directly by the spring. Extending through the base portion 50[a] and rigid in relation to the same is a pin 57 upon which is mounted a roller 58.

At 59 is a cam disk which is mounted fixedly upon the shaft 15. At 60 is a roller which is mounted upon a pin 61, the latter being carried by the wide portion 51 of the arm 50. Whenever the main shaft 15 is turned, the cam disk 59 turns with it and alternately pushes the rollers 60, 58 outward from the shaft 15 as a center. This causes the arm 50 to reciprocate in the general direction of its own length. The operator, however, by grasping the sleeve 53 by hand and drawing the sleeve to the right according to Fig. 4, may compress the spring 54 and remove the base portion 50[a] from the slot 51[a]. Then, by giving the sleeve 50 a quarter turn, he may cause the base portion 50[a] to extend directly upward so that the roller 58 is no longer within reach of the cam disk 59. This being done, the arm 50 is no longer under control of the shaft 15 and cam disk 59. The purpose of this arrangement will be described below.

Mounted rigidly upon the shaft 15 is a disk 62 carrying a pair of lugs 63, 63[a] integral with it and extending practically across its entire face. Disposed between the lugs 63, 63[a] is a latch 64. The disk 62 is provided with a hole 65 and the latch 64 is provided with a somewhat similar hole 66. These two holes are in registry with each other and together constitute practically a housing for a spring 67 which extends from one hole into the other, as will be understood from Fig. 4. The spring 67 is of spiral form and tends to press the latch 64 to the right. This latch is mounted at one of its ends upon a pivot pin 68 and swings upon this pin as a center.

Mounted rigidly upon the main shaft 15 is a disk 69 having integral with it a hub 70. By aid of a set screw 71 this hub, and consequently the disk 69, is secured rigidly to the shaft 15 and rendered revoluble with the same. The disk 69 carries one or more pins 72 each extending horizontally and provided with a reduced portion 63 which extends directly through the disk 69 in order to afford a good anchorage for the pin 72. The support 7 carries a pin 74 (see Fig. 3) and journaled upon the latter is a lever 75 provided with an upwardly extending portion 76, the upper end of which is formed into a latch 77. Partially encircling the portion 76 is a shackle 78 which is journaled upon a bolt 79 and normally rests against a shoulder 78[a]. Mounted upon the upwardly extending portion 76 and secured to the same by aid of a bolt 81 is another shackle

80. A guide rod 82 extends partially into each of the shackles 78, 80 and is encircled by a spiral spring 83. The shackle 80 can swing downwardly upon the bolt 81 as a center by compressing the spring 83.

Mounted upon the support 7 is a bracket 84 (see Figs. 3 and 4) which is held in position by aid of a bolt 85 and is provided with a hole 86. The bracket 84 is further provided with a slotted head 87 substantially in registry with the hole 86, as will be understood from Fig. 4. A stop pin 88 extends through the hole 86 in the general direction of the longitudinal axis thereof. This pin 88 is provided with a milled head 89 and with a lug 90, the latter fitting neatly into the slotted head 87, so as to normally hold the pin 88 in the position indicated in Fig. 4—that is, projecting slightly inward from the bracket 84. The operator by grasping the milled head 89 and pulling the same outwardly, at the same time turning it, may by compressing the spring partially withdraw the stop pin 88 so that its free end no longer projects inwardly from the bracket 84. With the stop pin 88 thus withdrawn, the latch 76 is free to swing, but with the stop pin 88 in the position indicated in Fig. 4, the latch 88 can not swing, and consequently the lever 75 can not be turned upon the pivot pin 74 as a center.

The outer end of the lever 75 is pivotally connected with a pitman 91, the latter being encircled by a spiral spring 92 which rests upon the plate 6 as indicated in Fig. 2, and normally tends to force the pitman 91 upward. A treadle 93 is connected with the lower end of the pitman so that a downward pressure upon the treadle tends to pull the pitman 91 downwardly and to compress the spring 92, thus rocking the lever 75. At 94 is a treadle bar carrying at its lower end a treadle 95 and at its upper end being mounted to swing upon a pin 96. The treadle bar 94 is provided with a slot 97 and adjacent to this slot the arm 50 is provided with a slot 98.

The operator by thrusting a key through the slots 97, 98 may connect the treadle bar 94 temporarily with the arm 50, so that by swinging the treadle 95 the arm 50 may be moved back and forth at will. To do this it is necessary to disconnect the machine from the control of the shaft 15 and this is done by moving the roller 58 (see Fig. 4) out of reach of the cam disk 59 and into the position indicated by dotted lines in Fig. 1.

The operation of my device is as follows: I will suppose at first that the machine is to be operated by power—that is, by rotation of the shaft 15. The parts being arranged as above described and the shaft 15 being continuously rotated, the machine is ready for action. The operator having connected a stamping bit or movable die member to the head 33 and arranged a piece of stock below this head, now wishes the head 33 to descend in order that the stock may be operated upon. The operator simply places his foot upon the treadle 93 and depresses this treadle. The pitman 91 is drawn downward, the lever 75 is rocked and the latch 71 is moved to the right, according to Fig. 3. The latch 64, under pressure of the spring 67, is now forced to the right according to Fig. 4, swinging, however, upon the pin 68 as a center. The disk 69 being rotated continuously brings the pin 72 against the protruding portion of the latch 64. This causes the disk 62 to turn. The operator having removed his foot from the treadle 93, the parts continue to move as described, until a single revolution of the shaft 15 is made. This being done the latch 64 moves against the adjacent bevel face of the portion 68 and causes the latch 64 to rock back into its normal position, as indicated in Figs. 3 and 4. That is to say, the latch 64 is simply forced back into its normal position and in so doing compresses the spring 65, but at the same time the latch 77 is moved for an instant slightly out of its normal position and clicks back again after the latch 64 is in its own normal position. If the operator keeps the treadle 93 pressed continuously downward, the machine will make more than one thrust of the head 33; but under ordinary conditions where only one thrust is desired the operator simply depresses the treadle 93 for an instant, then removes his foot and leaves to the machine the task of making a single thrust and no more. Each time the treadle 93 is depressed, and consequently the disk 62 is caused to make a single revolution, as described, the single turn made by the cam disk 59 causes the arm 50 to be thrust first toward the right, according to Fig. 1, and then to the left according to said figure. In doing this, the lever 46 is rocked once back and forth upon its pivot pin 46^a and the links 47, 48 cause the link 29 to rock similarly to the lever 46. In doing this there is a toggle action between the links 27, 29 and another toggle action, but in the opposite direction, between the links 29 and 31. The two toggle actions just mentioned are manifested by a longer thrust downward of the head 33 than would be the case if a single toggle action alone were used. Moreover, the toggle levers, links and other parts are much less apt to be broken if the construction above described be used. This is because the strains are distributed to better advantage. For instance, by having two links 47, 48 disposed upon opposite sides of the pivot pin 46^a, the strain communicated to the links 27, 29, 31 is considerably less than if it were conferred by some arrangement using only

a single link—say 27 or 48—to transfer power from the lever 46 to the other parts driven thereby.

Where the machine is driven by power as just described, the sleeve 53 (see Fig. 4) should be in such position that the base portion 50^a occupies the slot 51^a. In order to operate the machine by foot power, the first step is to disconnect the gearing. This is done as above described by grasping the sleeve 53, pulling it to the right according to Fig. 4, then giving this sleeve a partial turn, so as to elevate the base portion 50^a and leave the roller 58 extending upwardly as indicated by dotted lines in Fig. 1. The rotation of the shaft 15 is now unable to affect the arm 50 and if the power be cut off and the rotation of the shaft 50 be stopped altogether, the various cams, rollers, disks and other movable parts shown in Fig. 4, do not act as a load or otherwise interfere with the free movement of the toggle mechanism. The gearing being disconnected, the next step is to connect the bar 94 with the arm 50 and this is done by inserting a key through the slots 97, 98, as above described. A wooden key may be used for this purpose, if desired. The operator, by placing his foot upon the portion 45 and rocking the bar 94 upon the pin 96 as a center, causes the lever 46 to rock upon its pin 46^a, and in so doing actuate the toggle mechanism as above described. To restore the mechanism to its normal condition, all that is necessary is for the operator to swing the treadle 95 back to its normal position which is indicated by dotted lines in Fig. 1.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A device of the character described, comprising a fixed support, a lever journaled thereupon, links connected to oppositely disposed portions of said lever, a toggle link extending from one of said first-mentioned links to the other, a second toggle link pivotally connected with said first-mentioned toggle link and also pivotally connected with a normally fixed point, another toggle link pivotally connected with said first-mentioned toggle link and also connected with a head, and means controllable at will for rocking said lever.

2. In a metal stamping press, the combination of a support, a normally stationary head carried thereby, a toggle link journaled to said head, a sliding head, a toggle link journaled to the same, a third toggle link journaled at its ends to the other toggle links first-mentioned, a lever disposed parallel to said first-mentioned toggle link, connections from said lever to the ends of said third-mentioned toggle link, and means controllable at will for rocking said lever.

3. A device of the character described, comprising toggle mechanism, a lever for actuating said toggle mechanism, an arm connected with said lever for actuating the latter, a revoluble shaft, cam mechanism connected with said revoluble shaft for actuating said arm, means controllable at will for disconnecting said cam mechanism so as to render said arm idle, a treadle, and means for connecting said treadle to said arm.

4. A device of the character described, comprising a movable head, means including an arm for actuating said movable head, said arm having a slot, a sleeve mounted upon said arm and provided with a base portion extending into said slot, a roller mounted upon said base portion and removable therewith as said base portion is removed from said slot, a cam disk engaging said roller, and means for actuating said cam disk.

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

ERNEST HENRY VOGEL.

Witnesses:
JACOB J. BRAMY,
WILLIAM I. WOLFF.

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