

Draftsman

3050

x2902

Patented Nov. 4, 1902. x2744

x2885

x tool & press (28)

x2814

KC

No. 712,547.

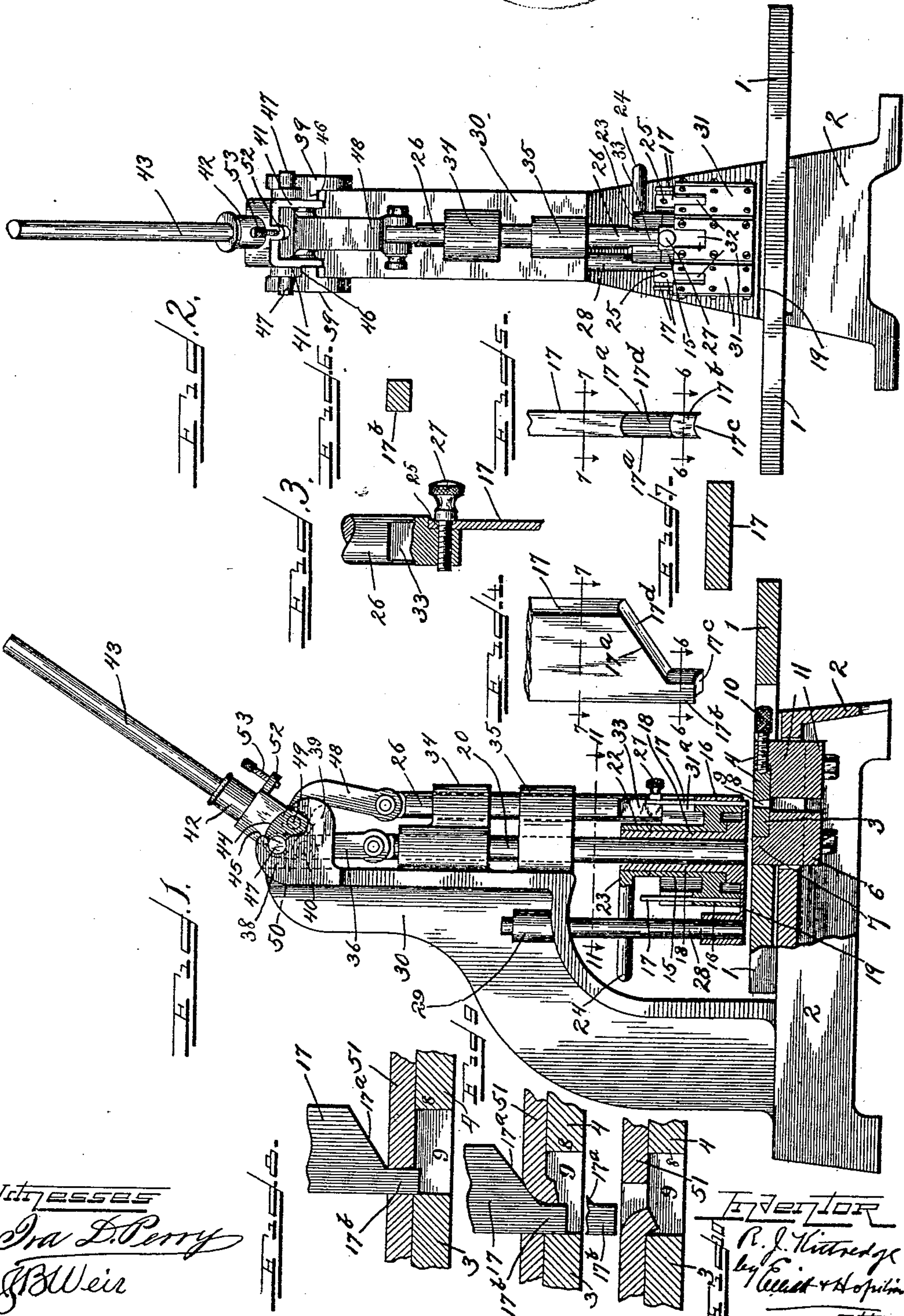
R. J. KITTREDGE.

PUNCH FOR MORTISING PRINTERS' PLATES.

(Application filed Mar. 28, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses

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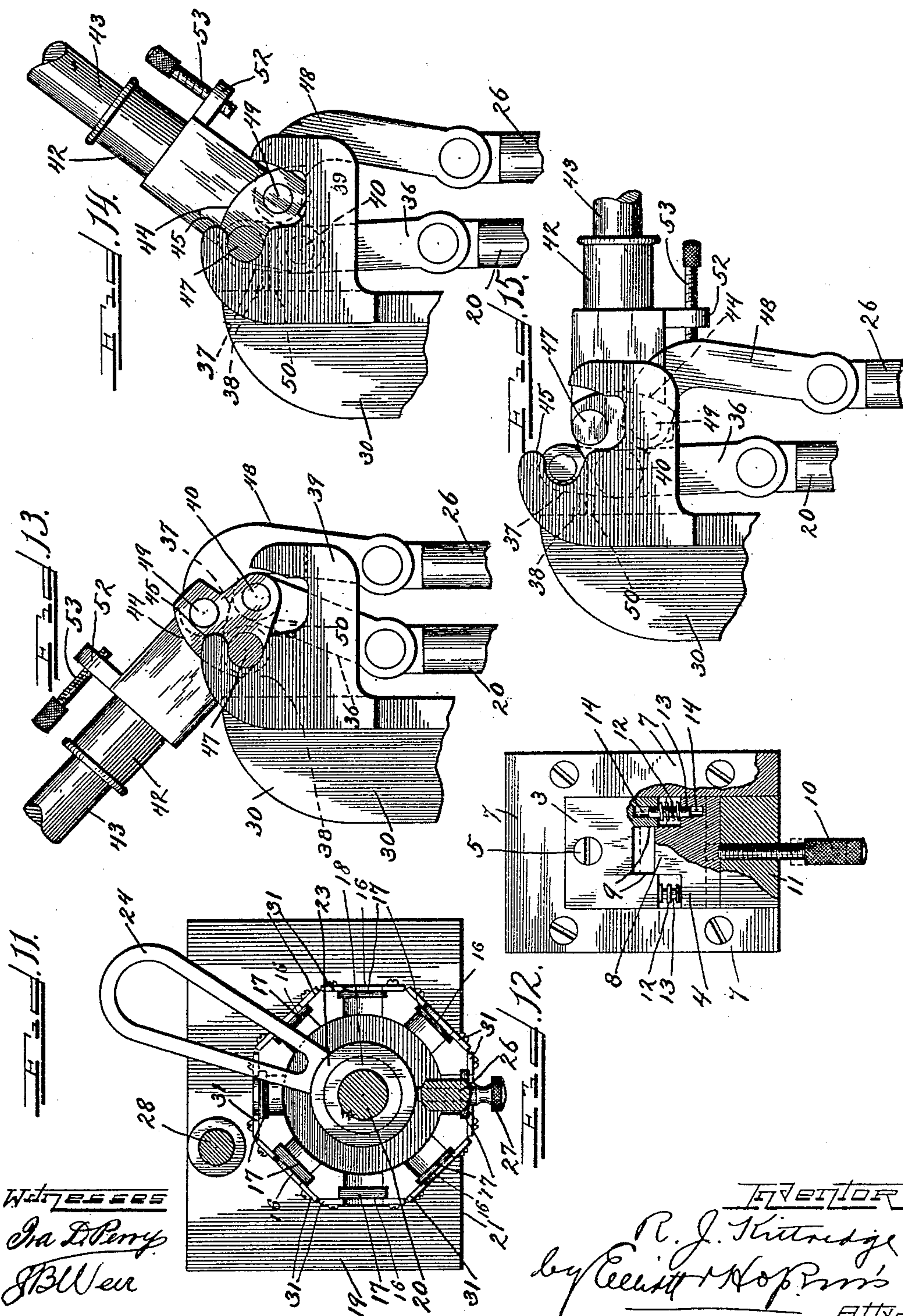
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4 Sheets—Sheet 2.



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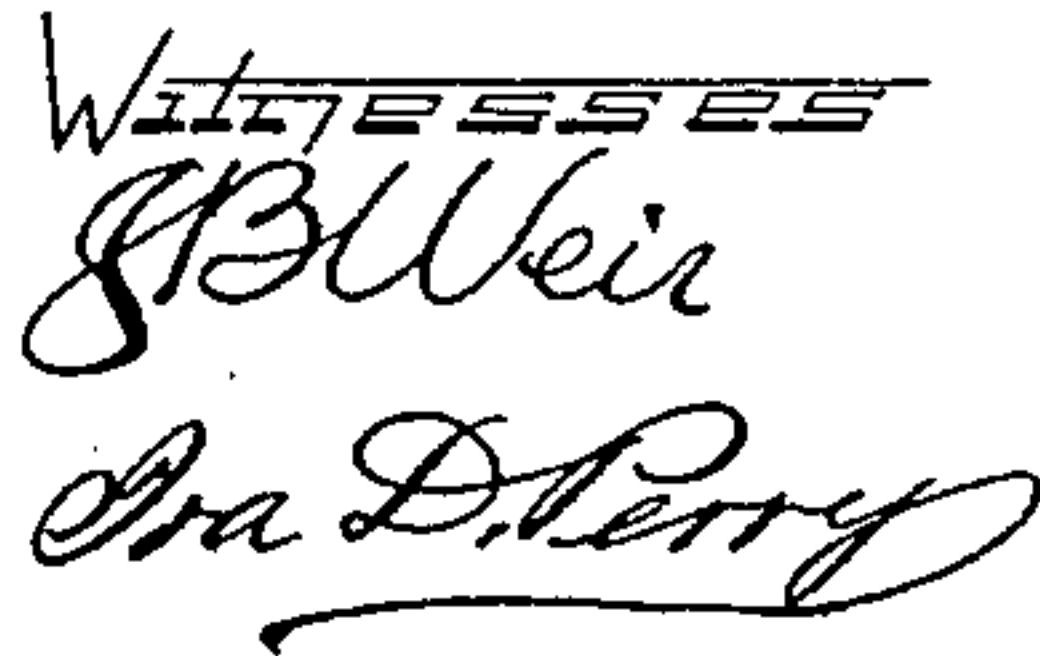
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4 Sheets—Sheet 3.



WITNESSES
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No. 712,547.

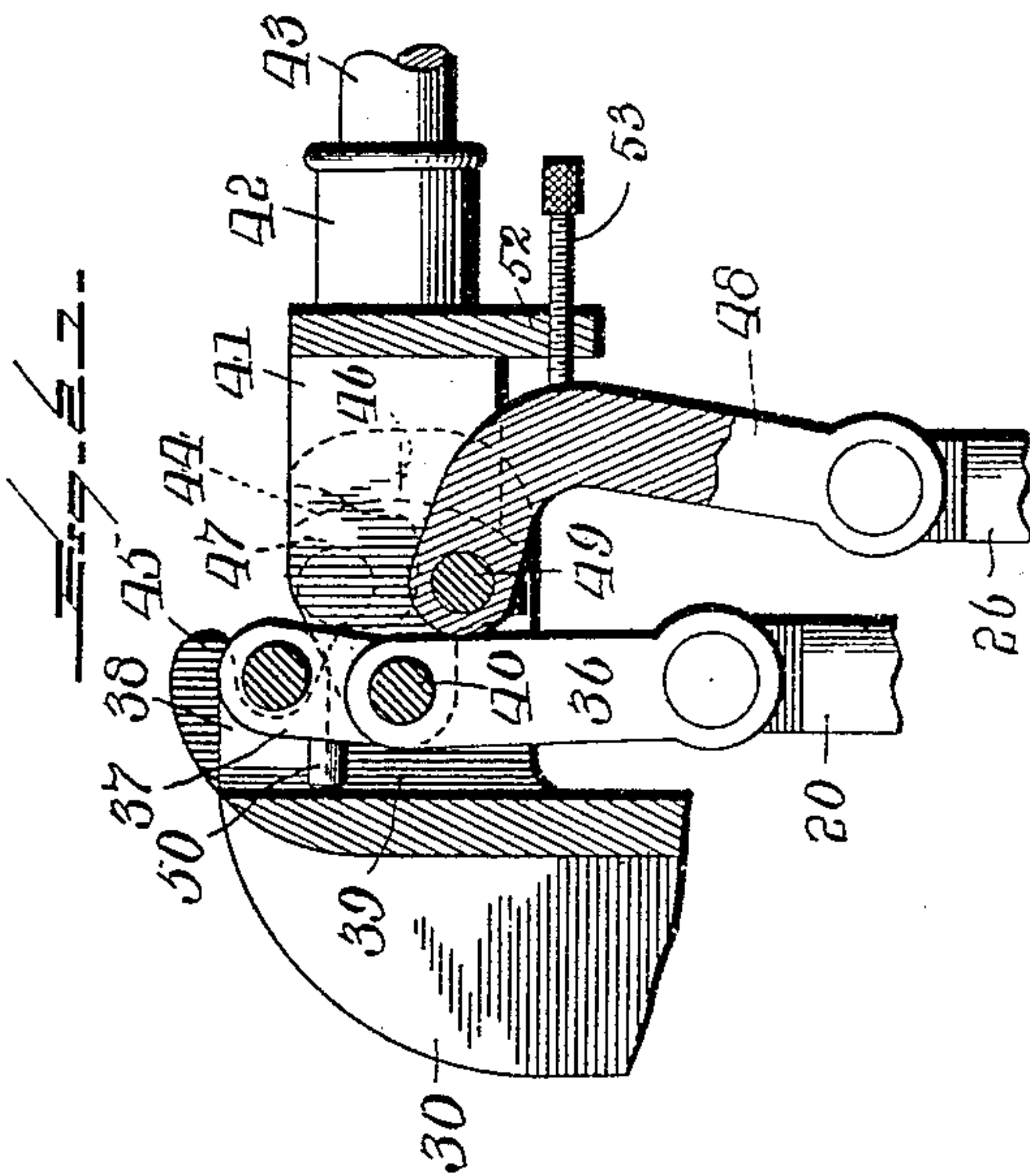
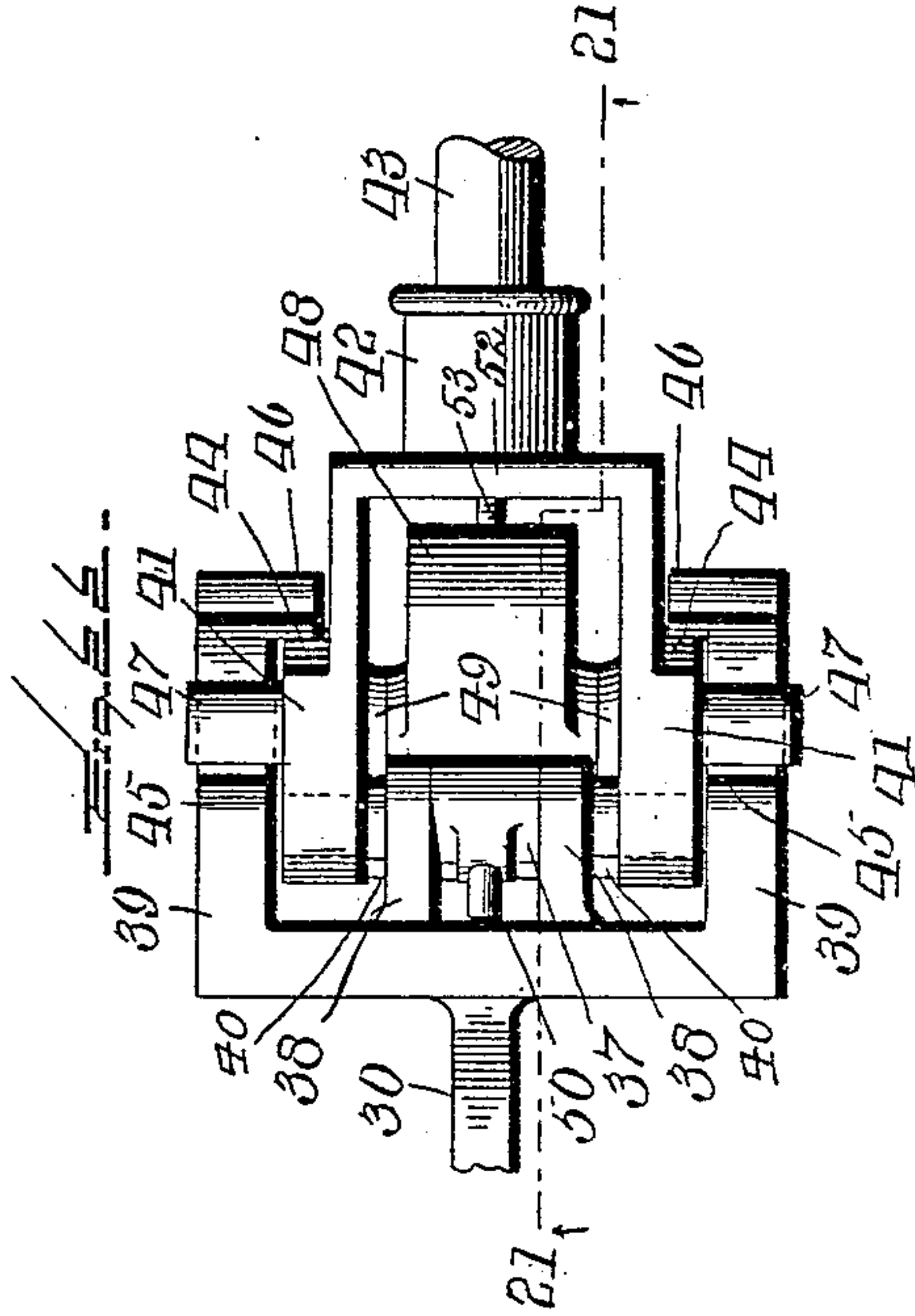
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

RUFUS J. KITTREDGE, OF CHICAGO, ILLINOIS.

PUNCH FOR MORTISING PRINTERS' PLATES.

SPECIFICATION forming part of Letters Patent No. 712,547, dated November 4, 1902.

Application filed March 28, 1901. Serial No. 53,197. (No model.)

To all whom it may concern:

Be it known that I, RUFUS J. KITTREDGE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Punches for Mortising Printers' Plates, of which the following is a full, clear, and exact specification.

My invention relates to punches or means for cutting mortises in electrotype, stereotype, and other plates in order that errors in the matter may be corrected by introducing an inset or separate type, word, or character in the mortise; and my invention has for its primary object to provide means whereby a mortise or aperture of any desired length may be readily formed through the plate with its edges sharply cut and at right angles or perpendicularly to the plane of the plate, so that the edges of the aperture will not require to be dressed or finished by hand, and the inset or type inserted therein will invariably have its face arranged flush with and in the same plane as the printing-face of the balance of the plate.

A further object of my invention is to provide an improved punch of such form and construction that the same punch may be utilized for cutting out mortises of different lengths, whereby a single letter or character or two or more letters or characters as well as one or more words may be neatly and accurately cut out of the plate without changing the punch.

A still further object of my invention is to provide means whereby printers' plates of various thicknesses may be clamped by the same apparatus while being held during the punching operation without danger of mashing or mutilating the plate.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of my improved machine, showing the lower portion thereof in vertical section. Fig. 2 is a front elevation thereof. Fig. 3 is an en-

larged detail view, partly in vertical section, of the lower end of the punch-rod, showing the upper part of the punch secured thereto. Fig. 4 is an enlarged detail perspective view of the lower end of one of the punches. Fig. 5 is an edge elevation thereof looking toward the left. Fig. 6 is a transverse section thereof, taken on the line 6 6, Figs. 4 and 5. Fig. 7 is a transverse section taken on the line 7 7, Figs. 4 and 5. Fig. 8 is a detail side view showing the smallest part of the punch cutting an aperture or mortise in a plate. Fig. 9 is a similar view showing the punch further depressed for cutting a still longer aperture or mortise. Fig. 10 is a similar view showing the plate as it appears in Fig. 9 taken out and turned around, so that the smallest end of the punch may be utilized for cutting off the hanging metal and finishing the end of the mortise or aperture when the punch is used for producing an aperture of less length than the maximum length of the punch. Fig. 11 is a plan section taken on the line 11 11, Fig. 1. Fig. 12 is a plan view of the table or plate-support, showing the female die therein partly in horizontal section. Fig. 13 is an enlarged side elevation of the operating handle or lever and connected parts, shown in the elevated or retracted position in order that the plate may be removed from the machine. Fig. 14 is a similar view showing the lever partly depressed, illustrating the manner in which the operating-rods for both the punch and the presser-foot are lowered together for a certain distance with the presser-foot in advance of the punch. Fig. 15 is a similar view illustrating the operating lever or handle still further depressed for locking the presser-foot against upward movement and continuing the downward movement of the punch-rod. Fig. 16 is a side elevation, partly in vertical section, showing a modified form of operating means. Fig. 17 is a front elevation thereof. Fig. 18 is a vertical sectional view of the punch-turret hereinafter described, showing a modification thereof consisting in means for holding punches from dropping down when not in use. Fig. 19 is a perspective view of a modified form of punch. Fig. 20 is an enlarged detail section of the punch-catch. Fig. 21 is a detail section on the line 21 21, Fig. 22; and Fig. 22 is

a detail plan view of the top of the operating mechanism as shown in Figs. 15 and 21.

1 represents a table or support of any suitable character mounted upon a base-frame 2 and having set therein a female die whose upper face is flush with the face of the table 1. This female die consists of two members 3 4. The member 3 is fixed, by means of screw 5 or any other suitable device, in a three-sided frame 7, which has cross-bar 6 secured to the base 2 in any suitable manner and forms a support for the member 3, as shown in Fig. 1. The member 4 is formed with a projecting tongue 8, which slides between the parallel edges 9, constituted on the fixed member 3 by the formation of a rectangular notch in the edge thereof. The inner end or edge of the tongue or projection 8 constitutes one of the longitudinal cutting edges of the transversely-located female die, while the opposed edge of such rectangular notch constitutes the other longitudinal edge of the female die. With the die thus constructed it will be seen that the inner cutting edge of the movable member 4 may be readily sharpened. The member 4 is movable to and from the member 3 and is suitably supported on the frame 7 with capability of sliding, as described, so that the size and width of the female die may be adjusted to suit the requirements. The movable member 4 may be thus forced toward the fixed member 3 by means of a set-screw 10, passing through a cross-bar 11, formed on or secured to the frame 7 and engaging against the outer edge of the movable member 4. The movable member 4 is forced outwardly as the screw 10 is backed off by means of cushions or springs 12, surrounding pins 13, which engage in sockets 14 in the fixed and movable members 3 4.

Arranged over the table 1 is a revolving turret or head 15, which is provided with a plurality of vertical sockets 16 of various sizes for the reception, respectively, of a plurality of punches or cutters 17. This turret-head 15 is journaled upon a hollow stem 18, projecting upwardly from a presser-foot or clamp 19, and this stem 18 is supported from above in any suitable manner. In the accompanying drawings I have shown this stem secured to the lower end of a rod 20, which is capable of vertical movement and operated by means presently to be described for forcing the presser-foot down against the printer's plate placed upon the table 1 over the female die 3 4. The forward edge 21 of the presser-foot 19 is so located with relation to the revolving turret 15 and the female die 3 4 that it will be directly over and parallel with the edge of the fixed member 3 of the female die and even with the inner edge of the punch or cutter 17 when the socket 16, carrying said punch, arrives at a position over the female die and parallel with the edge 21 of the presser-foot 19, so that the punch 17 may descend past the presser-foot for piercing the printer's plate and entering one end of the

female die when in the position described; but all of the other punches 17 in the turret-head will be over a part of the presser-foot 19, as clearly shown in Fig. 11. The punches 17 are supposed to be fitted in their sockets 16 with sufficient friction to prevent them from dragging with undue pressure against the surface of the presser-foot 19 when the turret-head is revolved and also preventing them from dropping down past the straight edge 21 as they arrive at a position parallel therewith. Any suitable friction device may be provided for this purpose. The turret-head 15 is shouldered on the stem 18, and the upper end of the stem is screw-threaded, as shown at 22, and upon this is arranged a nut 23, having suitable operating-handle 24, whereby the nut may be caused to clamp the turret-head against rotation upon the stem 18 when it is desired to operate the punch. Each of these punches 17 is provided in its upper end with an aperture 25, so that the same may be positively and rigidly attached to the lower end of a punch-operating rod 26 by means of a set-screw 27 or other suitable device. By this means it will be seen that the turret-head 15 may be rotated into position for bringing any one of the punches under the rod 26, whereby the latter may be secured to the punch, as described, the punches being marked or bearing some designation indicating their width and length, so that the punch of the desired size may be quickly selected and the turret-head again locked in position for operation. In order that the pressure-foot 19 may not revolve with the turret-head 15, the pressure-foot is provided with a guide-rod 28, which passes upwardly and loosely through a guide-sleeve 29, formed on the main standard 30 of the frame.

The outer side of each of the sockets 16 may be constituted by means of a removable plate 31, as shown more clearly in Fig. 2, and each of these plates is slotted in its upper end, as shown at 32, to receive a squared end 33 of the punch-operating rod 26, and thus positively hold the turret-head against accidental rotation while the punch-rod 26 is descending. The slot 32 also permits of the downward movement of the set-screw 27. The slot 32 is also deflected back of the plate 31 in the upper edge of the turret 15, as shown at 31^a, and the squared end 33 of the punch-rod also engages in this slot 31^a.

The punch-rod 26 passes upwardly parallel with the pressure-foot rod 20, and both are held against lateral movement by suitable guides 34 35, formed on the standard 30. The upper end of the pressure-foot rod 20 is pivoted to the lower end of a link 36, whose upper end is in turn pivoted to the lower end of a shorter link 37, and the upper end of the latter link is pivoted to a lug 38, formed on the standard 30 between two side supports 39, also formed on the standard 30. The pivot-pin 40, which connects the upper end of link 36 to the lower end of short link 37, also piv-

otally connects both of these links at their meeting ends to the lower ends of two bifurcations 41, (see Figs. 2, 21, and 22,) formed on a socket-piece 42, in which the operating-handle 43 is secured. Each of these bifurcations 41 is also provided at its lower end and on the outer side with a cam or curved shoulder 44, and the side members 39 are formed with notches, providing hooks 45 at the upper sides, and with shoulders 46 on the inner sides of their outer ends. With the construction described it will be seen that when the handle or lever 43 is in its elevated position, as shown in Fig. 13, a fulcrum-pin 47, secured to the outer face of each of the bifurcations 41, fits into and is supported in the notches beneath the hooks 45 in the manner shown in Fig. 13, and when in this position the lever 43 takes its fulcrum in said notches and lifts the presser-foot through the intermediary of pivot-pin 40, link 36, and rod 20 and also lifts the punch-rod 26 through the intermediary of a curved link 48, pivoted at its lower end to the upper end of the punch-rod 25 and at its upper end between the forks 41 by means of a pivot-pin 49. Now when the lever 43 is pulled over to the position shown in Fig. 14 the lower end, carrying the pivot-pin 40, will force the joint of the toggle constituted by links 36 37 backwardly toward the standard 30, and consequently depress the presser-foot, and inasmuch as the pivot-pin 49 also comes downwardly during this movement the punch-rod 26 will be also lowered a considerable extent, but not sufficiently at this period to force the punch down into engagement with the female die. When the parts arrive at the position shown in Fig. 14, the cam or shoulder 44 is about to engage the shoulder 46, formed on the inner face of each of the supports 39, and when cam or shoulder 44 thus engages shoulder 46 the lever 43 will change its point of fulcrum from the notches beneath the hooks 45 to the center or pin 40, outward movement toward the right being prevented by the engagement of shoulders 44 with shoulders 46, and the toggle accordingly forced inwardly slightly beyond the center or direct line between centers in the manner shown in Figs. 15, 21, and 22. The toggle is prevented from moving toward the left too far by means of a pin 50, formed on or secured to the back of the link 37. Thus it will be seen that when the toggle-levers 36 37 straighten out, as shown in Fig. 15, further downward movement of the presser-foot bar 20 will be prevented; but the punch-bar 26 will continue to move downwardly until the upper end of the link 48, which is curved toward the toggle, comes against the latter. Hence the punching is effected only after the presser-foot has been forced down and securely locked on top of the printer's plate.

The formation of the lower end or cutting end of each of the punches is clearly shown in Figs. 4 to 10, inclusive. It is apparent from these figures that each punch is pro-

vided with a rectangular steep inclined end 17^a, which extends downwardly from one edge of the punch to a point or squared portion 17^b, whose vertical edges are parallel, the outer one of which edges being constituted by the edge of the main portion of the punch. With the punch thus constructed it will be seen that the point 17^b constitutes in itself a punch for entirely cutting out an aperture or mortise in the plate equal in size to the cross-section of said point 17^b. These points 17^b on the different punches contained in the turret-head may be so grouped in size as to correspond with the cross-section of the body portion of the various sizes of types, so that a single type or character may be cut from the plate by forcing the punch 17 downwardly until the point 17^b passes through the plate 51 in the manner shown in Fig. 8, thus producing a hole or aperture finished on all sides and ready for the reception of the inset or type. If, however, it should be desirable to utilize the same punch for cutting out two or more letters or an entire word, the punch 17 would be forced downwardly until its beveled edge 17^a touches and cuts the plate 51 at the end of the line, word, or letter to be removed in the manner shown in Fig. 9. The punch is then elevated, the plate 51 taken out, and turned around, so that the aperture or mortise will be turned end for end, in the manner shown in Fig. 10, bringing the uncut end of the mortise directly under the outer edge of the punch-point 17^b, so that the next time the punch is depressed the tongue or hanging metal will be entirely severed from the plate and both ends, as well as the sides of the mortise or aperture, will be finished.

In order that the downward movement of the punch 17 may be accurately gaged so as not to descend too far, I provide any suitable means for adjustably limiting this downward movement. In the drawings I have shown the socket member 42 provided with a support 52 for a set-screw 53, which is so arranged that its point will impinge the outer side of link 48 when lever 43 is depressed, thus limiting the downward movement of the lever, and consequently the downward movement of the punch.

In order that the punch 17 may cut a clean aperture, leaving no blurs or ragged edges on the plate, the lower cutting faces or edges of the punch are hollow-ground, as shown at 17^c 17^d, whereby when they impinge the metal they will exert a tendency to pinch the metal together rather than expand it, and as a consequence swelling or expansion of the metal around the aperture, as well as ragged edges, will be entirely avoided.

In the modified form of operating mechanism shown in Figs. 16 and 17 the lever or operating-handle 43 is pivoted permanently on a pivot 47^a, which is mounted in a pair of ears 45^a on the standard 30, and the socket-piece 42 of said lever is provided with a curved finger or cam 42^a, which projects between

the branches of a yoke 36^a, carrying at their upper ends an antifriction-roller 40^a, under which the finger 42^a engages. Formed above the finger 42^a on the socket-piece 42 is a cam 44^a, and to the upper end of this cam 44^a are pivoted the upper ends of a pair of links 48^a, whose lower ends are pivoted to the upper end of the punch-rod 26. The yoke 36^a is secured to the presser-foot rod 20^a by means of an adjustable or yielding connection, whereby the yoke 36^a may have a stroke of uniform length and the presser-foot be caused to always engage and hold the plate, while the plates may be of various thicknesses. This adjustable or yielding connection preferably consists of a pin 20^b, inserted in a socket 20^c in the upper end of rod 20^a and connected to rod 20^a by means of a pin 20^d, which passes through a vertically-elongated aperture or slot 20^e in the pin 20^b, and at the bottom of the socket 20^c under the pin 20^b is interposed a coil or other suitable spring or cushion 20^f, which tends to hold the pin 20^b at the upper extremity of its movement with reference to the rod 20^a. In the position shown in Fig. 17 the presser-foot rod 20^a is being held aloof and at the upper extremity of its movement by means of the curved and tapering finger 42^a engaging under the roller 40^a, and the punch-rod 26 is held at the upper end of its movement by means of the links 48^a and their pivotal connection with the socket-piece 42. Should the operating-lever 43 be thrown to the right, as viewed in Fig. 16, the presser-foot rod 20^a will be permitted to descend as the gradually-tapering part of the finger 42^a recedes from under the roller 40^a, such finger being so formed as to permit the rod 20^a to descend faster than the rod 26, and before the rod 26 has received sufficient downward movement to cause the punch to impinge the plate the cam 44^a will have engaged and depressed the roller 40^a sufficiently to hold the plate in position through the medium of the spring or cushion 20^f, whereupon the punch will be forced through the plate, the rod 20^a receiving no further downward movement by reason of the fact that the upper surface of the cam 44^a is struck on an arc from the center 47^a. By this means it will also be seen that the punch will be withdrawn and elevated clear of the plate while the concentric portion of the cam 44^a is passing over the roller 40^a, and as a consequence the presser-foot will remain in place until the punch is withdrawn. In this form of the operating mechanism I dispense with the adjusting-screw 53 and instead thereof provide the rod 26 with a series of perforations or sockets 26^a, in either of which may be inserted a stop or pin 26^b for arresting the downward motion of the rod 26, it being understood that the stop 26^b comes against the upper side of the guide 34 after the concentric part of cam 44^a has engaged the roller 40^a, and hence stop 26^b does not interfere with the operation of rod 20^a.

In Fig. 18 I have shown the sockets for the

punches 17 provided with means for holding said punches aloof when not secured to the punch-rod 26. Said means preferably consists of an antifriction-ball 54, located in a recess 55, formed in the turret back of the punch 17 and pressed normally against the rear face of the punch by means of a coil-spring or other suitable cushion 56, acting against a head 57 on a stem 58, around which the spring 56 is coiled. The rear face of the punch 17 is provided with a socket 17*, arranged in line with the ball 54, so that when the punch rises the latter will engage in said socket and hold the punch from falling by force of gravity while not interfering with the operation of the punch, and, in fact, during the operation of the punch the socket 17* may be below the ball 54; but when the punch is out of action and its lower end is above the presser-foot 19 the ball is engaged therein, as shown on the left in Fig. 18. The antifriction-balls 54 may be held in their respective sockets by partially upsetting the outer end of the socket around the outer side of the ball in a well-known manner.

In Fig. 19 I have shown a form of punch in which the cutting end is formed on an arc of a circle, as shown at 17^c.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a device for the purpose described, the combination of a revoluble series of punches of different sizes and a female die for receiving the same having an adjustable side whereby it may be made to conform in size to said different-sized punches, substantially as set forth.

2. In a device for the purpose described, the combination of a revoluble turret having a series of punches of different sizes and a female die for receiving the punches having an adjustable side whereby it may be made to conform in size to said different sizes of punches, substantially as set forth.

3. In a device for the purpose described, the combination of a revoluble turret having a series of punches of different sizes, means for removably holding the punches to the turret, and a female die for receiving the punches having an adjustable side whereby it may be made to conform in size to said different sizes of punches, substantially as described.

4. In a device for the purpose described, the combination of a female die adjustable in size, a presser-foot, a turret revoluble on the presser-foot, a series of punches of different sizes mounted on the turret, and means for operating the punches when brought over the female die, substantially as set forth.

5. In a device for the purpose described the combination of a female die, a punch having an inclined cutting edge, means for actuating said punch and means for adjustably limiting the movement of said punch with relation to said die, comprising a rod having a series of perforations, a stop adjustable in the per-

forations and a guide with which the stop contacts, substantially as set forth.

6. In a device for the purpose described the combination of a female die, a presser-foot for holding the plate to be punched over said die, a punch, and means for actuating said presser-foot and punch one in advance of the other, comprising a presser-foot rod secured to the presser-foot, a yoke secured to the rod, a lever mounted above the yoke, and having a curved finger adapted to engage the yoke and a cam above the finger, a punch-rod to which the punch is secured and links pivoted at their upper ends to the cam and at their lower ends to the punch-rod, substantially as set forth.

7. In a device for the purpose described the combination of a female die, a presser-foot for holding the plate to be punched over said die, a punch and means for depressing said presser-foot in advance of said punch and depressing the punch after said presser-foot is depressed but withdrawing the punch before said presser-foot is elevated, comprising a presser-foot rod having a socket in its upper end, a cushion located in the socket, a yoke having a pin formed with a vertical slot and inserted in the socket, so as to bear on the cushion, a pin extending through the socket and aperture, a lever mounted above the yoke, and having a curved finger adapted to engage the yoke, and a cam above the finger, a punch-rod to which the punch is secured and links pivoted at their upper ends to the cam and at their lower ends to the punch-rod, substantially as set forth.

8. In a device for the purpose described a female die comprising a three-sided frame, a fixed member having a rectangular slot formed with parallel edges, a cross-bar, a set-screw working in the cross-bar, a movable member located between the set-screw and the fixed member and having a tongue adapted to slide in the slot, and springs located between the members, substantially as set forth.

9. In a device for the purpose described the combination of the presser-foot, the presser-foot rod, the hollow stem surrounding the presser-foot rod, the turret, journaled on the hollow stem and having vertical punch-sockets, the punches mounted in the vertical punch-sockets, and a nut for locking the turret to the hollow stem, substantially as set forth.

10. In a device for the purpose described the combination of the presser-foot, the presser-foot rod, the turret, journaled on the hollow stem, and having vertical punch-sockets, the punches mounted in the vertical punch-sockets, a guide-sleeve and a guide-rod extending through the guide-sleeve, substantially as set forth.

11. In a device for the purpose described the combination of the presser-foot, the presser-foot rod, the hollow stem surrounding the presser-foot rod, the turret journaled on the hollow stem and having vertical punch-sockets, the punches mounted in the vertical punch-sockets and having apertures at their upper ends, the punch-operating rod perforated at its lower end, and a set-screw adapted to extend through the punch-apertures and to secure the punches to the lower end of the punch-rod.

12. In a device for the purpose described, the combination of the presser-foot, the presser-foot rod, the hollow stem surrounding the presser-foot rod, the turret journaled on the hollow stem and having vertical punch-sockets surmounted by slots, the plates having slots and secured to the vertical punch-sockets and the punch-rod having a squared end fitting the slots in the vertical punch-sockets and in the slots of the plates, substantially as set forth.

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Witnesses:

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