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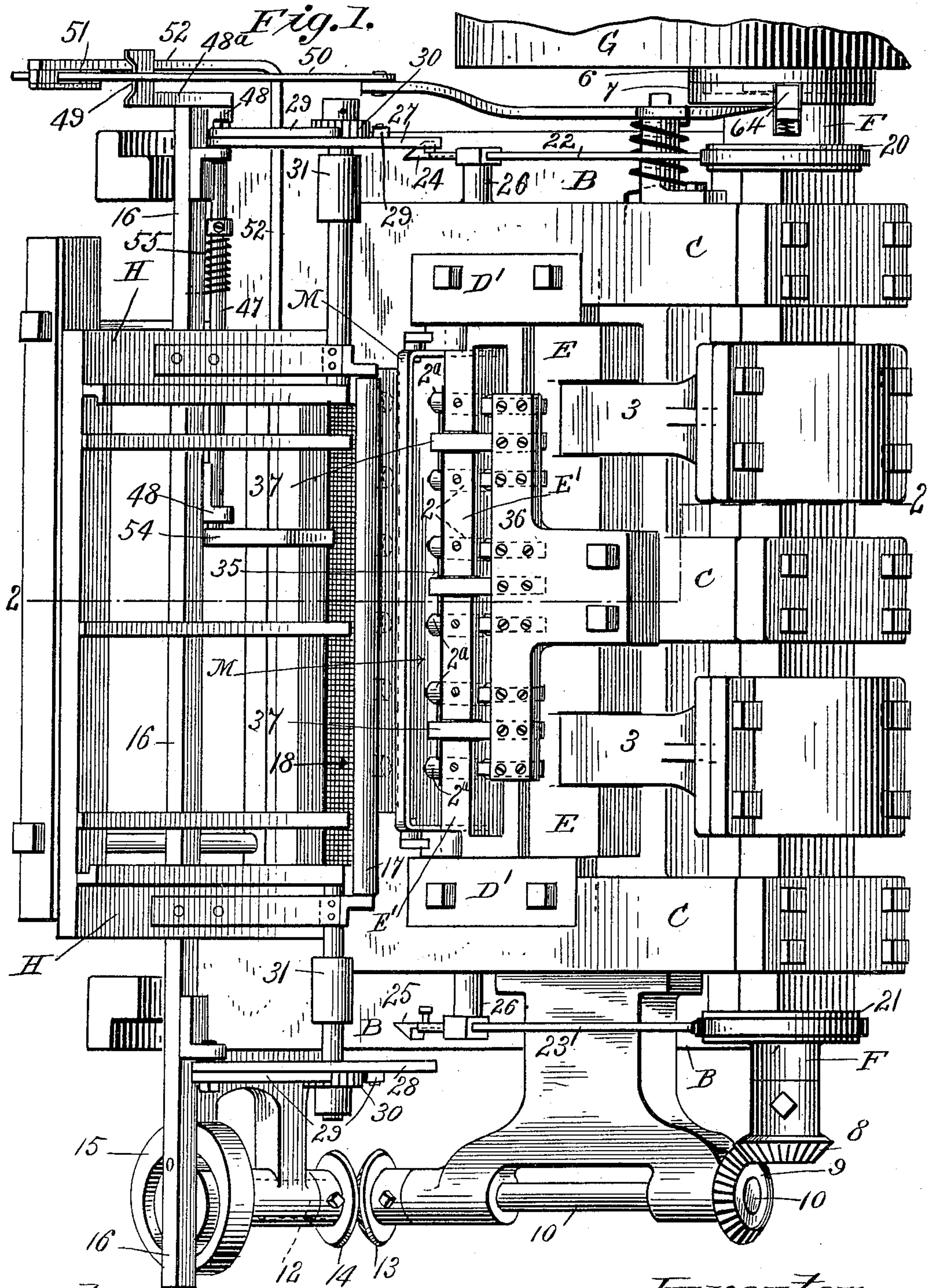
Patented Oct. 4, 1898.

W. E. BENNETT.
BUTTON PUNCH PRESS.

(Application filed Dec. 30, 1897.)

(No Model.)

4 Sheets—Sheet 1.



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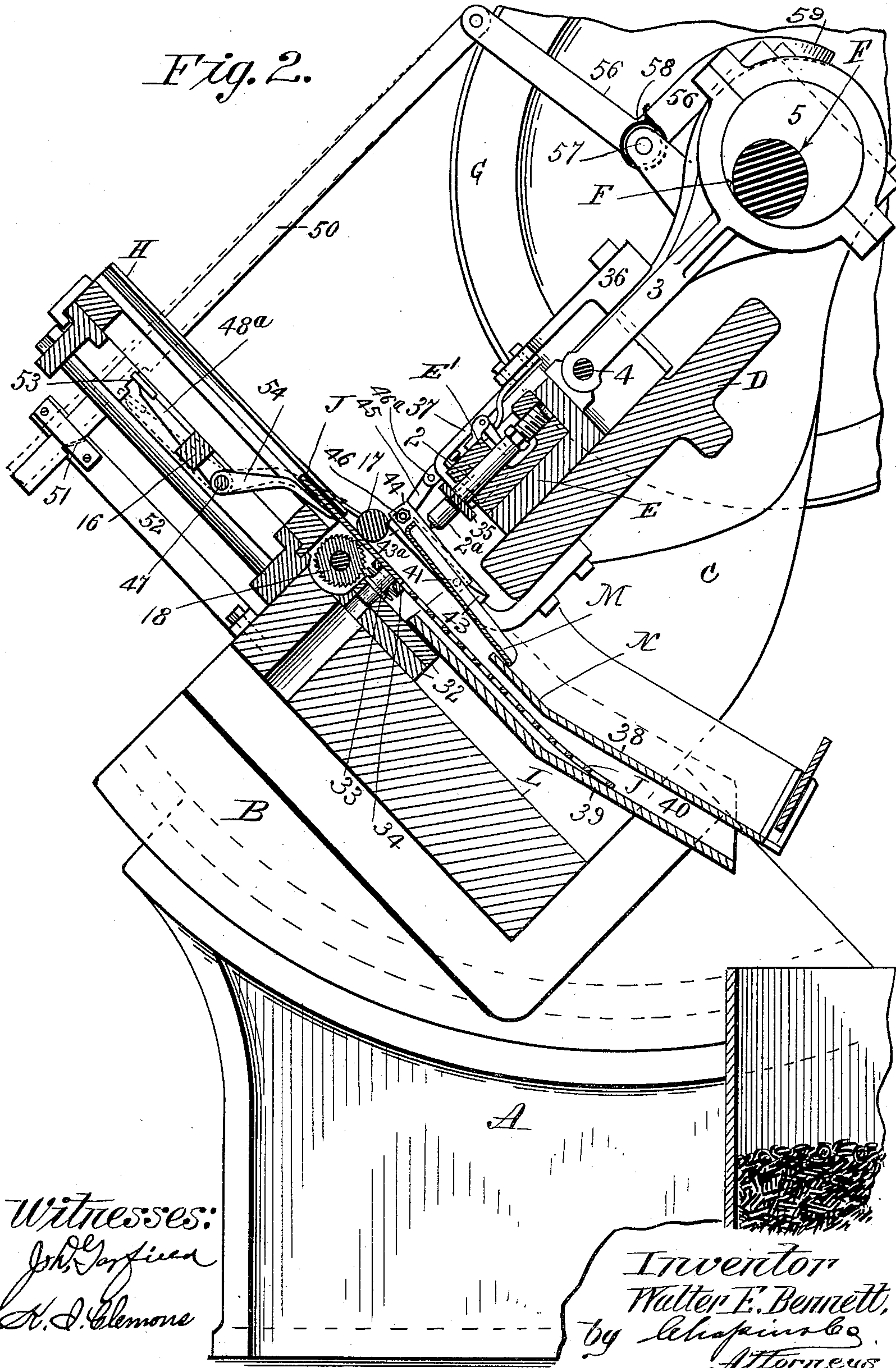
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4 Sheets—Sheet 2.



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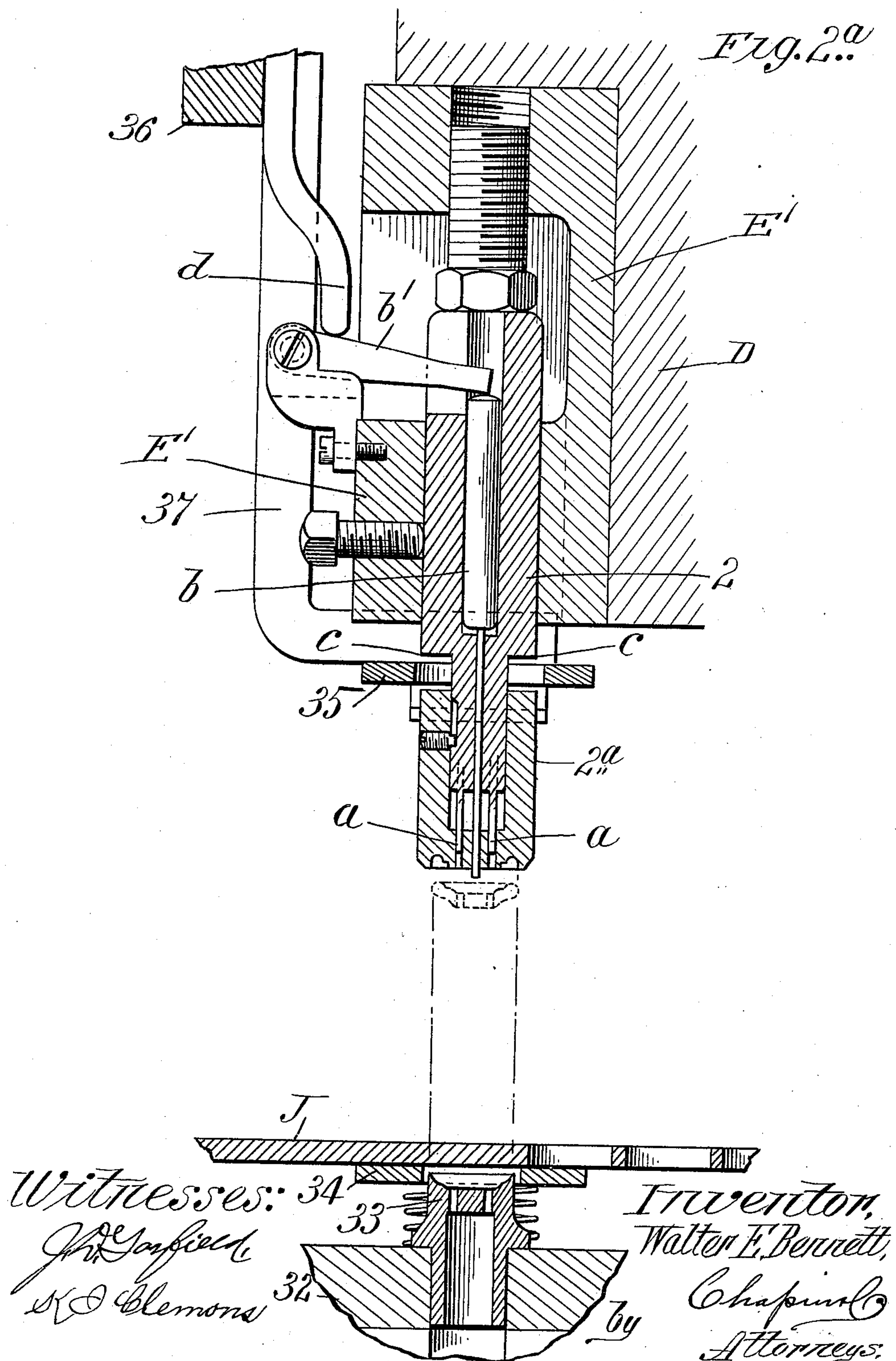
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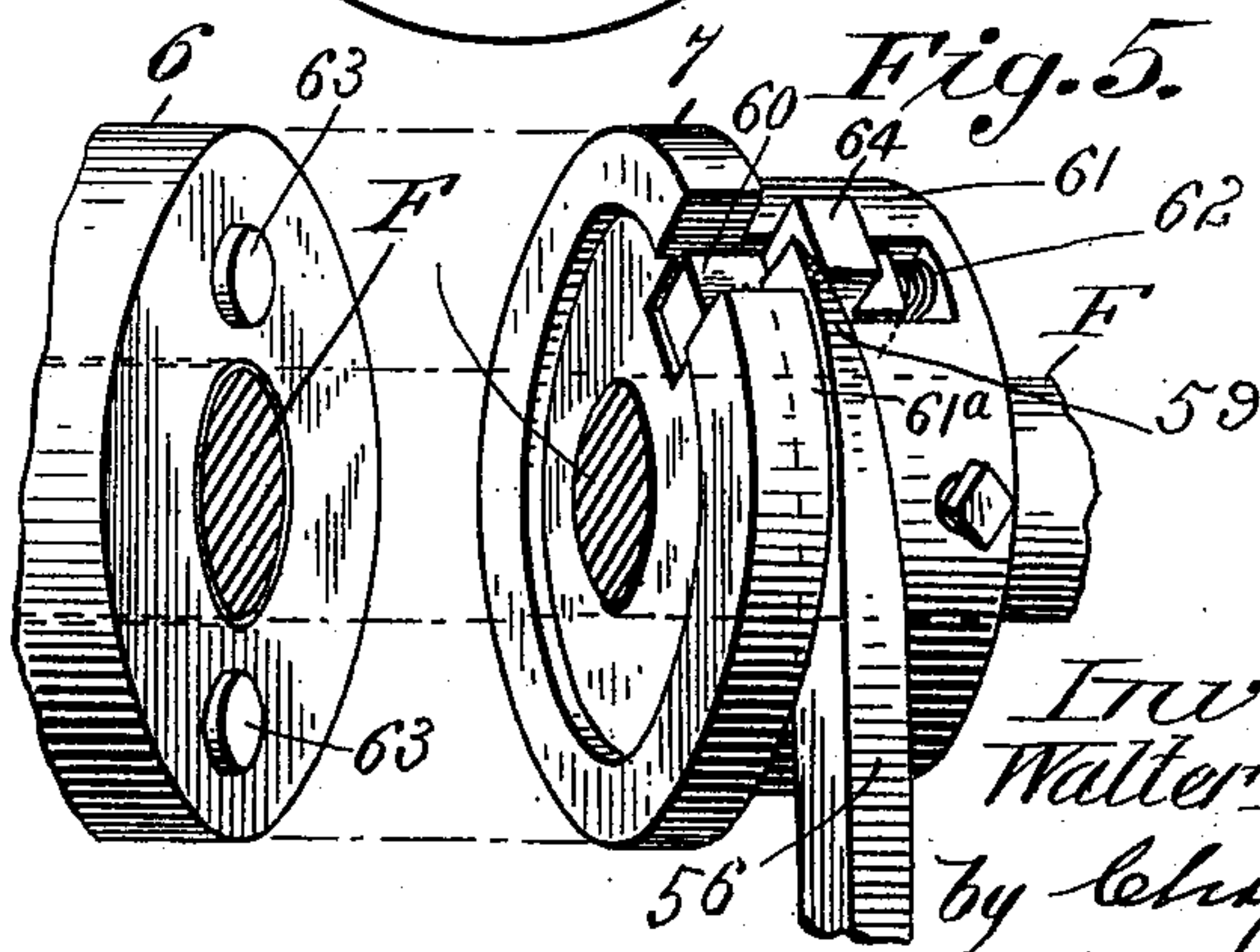
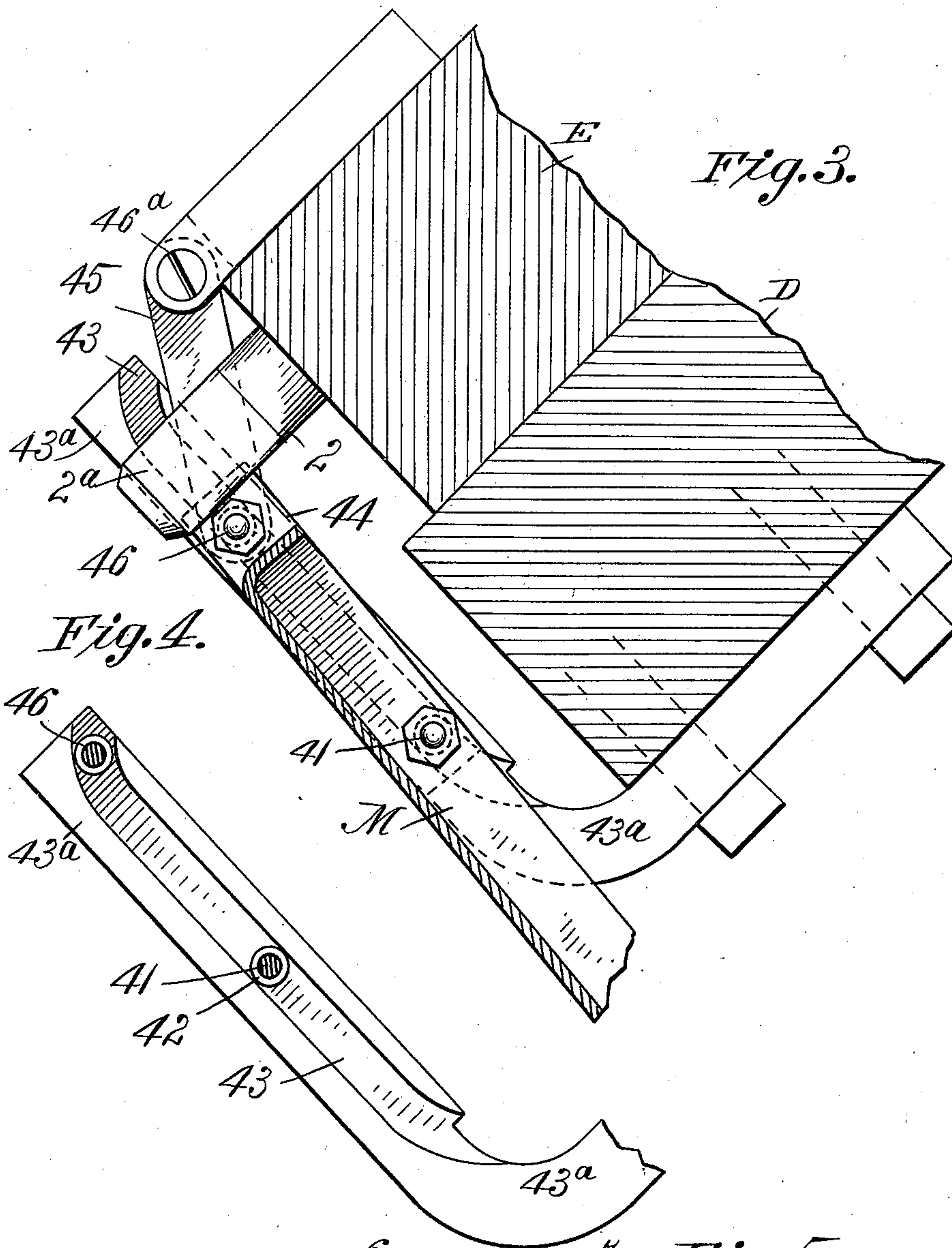
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

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THE MORLEY BUTTON MANUFACTURING COMPANY, OF SAME PLACE.

BUTTON-PUNCH PRESS.

SPECIFICATION forming part of Letters Patent No. 611,988, dated October 4, 1898.

Application filed December 30, 1897. Serial No. 664,615. (No model.)

To all whom it may concern:

Be it known that I, WALTER E. BENNETT, a citizen of the United States of America, residing at Portsmouth, in the county of Rockingham and State of New Hampshire, have
5 invented new and useful Improvements in Punch-Presses, of which the following is a specification.

This invention relates to punch-presses, and
10 particularly to presses for punching articles out of a strip of material continuously fed through the press; and the purpose of the invention is to provide for a machine of this class means for stopping the press when the
15 material being fed to the press is exhausted, for removing the article punched therefrom, and to provide for the separation of the waste material from the punched-out article; and the invention is in the nature of an improvement on my patent, dated October 30, 1894,
20 No. 528,502, and the machine shown and described herein is provided with the same feed mechanism and similarly-disposed punching mechanism as is shown and described in my
25 said United States Letters Patent above referred to.

My invention consists in the construction and arrangement of the press, as hereinafter set forth in the accompanying specification
30 and claims.

Referring to the drawings forming part of this specification, Figure 1 is a top plan view of a press embodying my improvements. Fig. 2 is a side elevation in section, the latter being on line 2 2, Fig. 1. Fig. 2^a is an enlarged sectional elevation showing the punch at the limit of its upward movement. Fig. 3 is an enlarged view, in vertical section, of the lower end of the sliding head and punch-block in
40 which the punches are secured, a part of the frame, and means for operating the carrier into which the punched articles are dropped from said punch. Fig. 4 is a view of a part of the frame on which is supported the carrier for removing the punched articles. Fig. 5 is a perspective view of a clutch mechanism for stopping and starting the press and showing a part of a connection which extends to a stop-motion mechanism.

50 The form of press shown herein is that in

which the top of the standard or base is provided with segmental ways on which the similarly-shaped base of the upper part of the press is supported, whereby said upper part, having attached thereto all of the operative
55 parts of the machine, may be rotatably adjusted to any desired angle in one vertical plane relative to the perpendicular.

In the drawings, A represents the standard or base of the machine. B represents the upper part thereof, mounted for adjustment on said base in one vertical plane, whereby the axial lines of the punches and dies supported in said upper part B may be given any desired degree of inclination relative to the perpendicular. Suitable bolts (not shown) lock
65 said upper part to said base in the desired position. On said upper part B and cast integral therewith are the uprights C, united transversely by a web D, a part of which is
70 faced off to form a bearing for the back side of the vertically-reciprocating sliding head E, the ends of the latter being provided with gibs or ways D' on the inner surfaces of the uprights C on opposite sides of said upper
75 part B of the press, as shown in Fig. 1.

The punches 2 are secured in a block E', which is bolted to the sliding head E, and the connecting-rods 3, having a pivotal connection with said sliding head at 4, extend up to
80 a driving-shaft F, supported in the upper extremities of the said uprights C. On said driving-shaft F are located the eccentrics 5, with which said connecting-rods 3 engage and by means of which the referred-to recip-
85 rocating movements are imparted to said sliding head E. On one end of said driving-shaft F is a driving-pulley G, and on the hub 6 of said driving-pulley and a collar 7 on said driving-shaft a clutch mechanism, such as is
90 ordinarily employed in machines of this description, is located. Said clutch is illustrated in Fig. 5, and means (described farther on) are provided for operating said clutch to disengage the said driving-pulley
95 G from said driving-shaft F when the material being fed into the press becomes exhausted. On the opposite end of said driving-shaft F to that on which the driving-pulley G is located is a bevel-gear 8 in mesh with
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another bevel-gear 9 on the end of a shaft 10, supported on the part B of the machine and connected with a second shaft 12 by bevel-gear 13 on said shaft 10 in mesh with the gear 14 on said shaft 12. A cam 15 is secured on the opposite end of the shaft 12 and engages a bar 16, forming part of the carriage H, through which a transverse sliding movement is imparted to said carriage, on which is carried the stock J to be operated upon by the punches and dies of the machine. The said carriage and the means employed for moving it transversely are identical with the construction described in my above-referred-to United States Letters Patent, dated October 30, 1894, No. 528,502, and as it forms no part of this invention a detailed description thereof is not deemed necessary. A pair of feed-rolls 17 18 are supported in suitable bearings on the edge of the said carriage H next to said punches 2, between which rolls the stock J passes. These feed-rolls are rotated intermittently to feed forward said stock J during the upstroke of said punches 2, as follows: On the driving-shaft F, near each end thereof, are the eccentrics 20 21, which operate the rods 22 23, which are provided with hooks 24 25, said rods being supported from the frame at 26 to move reciprocally in position to engage periodically and alternately with the arms 27 and 28, which actuate the pawls 29, engaging with the ratchet-wheels 30 on opposite ends of the lower feed-roll 18. The latter, while it moves transversely with the carriage H, is supported on the upper part B of the press in bearings 31, through which it slides as the carriage H moves transversely, and as the distance between the arms 27 and 28 is as much greater than the distance between the rods 22 and 23 as the distance traveled transversely by the carriage H it follows that the hooks 24 25 on the ends of said rods 22 23 will alternately engage with suitable sockets in the arms 27 and 28 at the end of each transverse movement of said carriage H, and the rotation of the eccentrics 20 21 is so timed that at the moment of the said engagement of the said hooks and arms said rods begin to move in a direction to impart to said lower feed-roll 18 the desired degree of rotation to feed the stock forward, and said feed movement takes place while said carriage H is momentarily at rest. Thus the same cross and forward movements are given to the stock J that are fully described in my said United States Letters Patent above referred to.

A bed-plate L is bolted to the upper part B of the machine, on which are secured the die-plates 32, having the dies 33 therein in line axially with the punches 2. The tops of said dies 33 extend up to the level of the top of the feed-roll 18, and a clearer or stripper bar 34, having apertures therein through which said dies may pass, is supported on springs on the die-plate in such position that the upper surface of said stripper-bar is ap-

proximately level with the tops of the said dies 33.

In the machine herein described the punches 2 are rigidly supported in the punch-block E', which is given vertically-reciprocating movements through suitable eccentric connections with the shaft F.

Fig. 2^a of the drawings illustrates the position the parts assume at the limit of the upward movement of the punch-block E', at which point the button-blank is forced off from the end of the punch part 2^a. As the punch-block E' descends the stock J is compressed slightly between the end of the part 2^a of the punch and the die 33, and the part 2 of the punch, continuing its downward movement, forces the perforating-punches *a* through said stock. These punches are of the usual construction and consist of suitably-tempered pieces of steel let into the end of the part 2 of the punch. Centrally within the said punch part 2 is located the clearing-plunger *b*, whose function is to disengage the blank from the end of the part 2^a of the punch, at or near the limit of the upward movement of the punch, as will hereinafter be described. As soon as the punch begins its descent said plunger *b* is free to move in said part 2 of the punch, and in Fig. 2^a it is shown in the position it occupies after having been operated to force a blank off from the end of the part 2^a of the punch, said blank being indicated in dotted lines. This operation leaves the end of said clearing-plunger protruding beyond the end of the punch part 2^a. As soon as the punch and die come together against opposite sides of the stock the plunger *b* is forced back into the punch and in its upward movement raises the end of a lever *b'*, which bears on its upper end and is pivotally supported by its other end on the punch-block E'. Said lever *b'* is thus left in position to be again operated at the proper time, as will be described, to force said plunger down again to disengage another blank from the end of the punch part 2^a.

A bar 35 is provided with apertures through which the lower ends of the punches 2 are passed, and a suitable engagement is provided between said bar and the lower ends 2^a of the said punches, whereby said bar is supported a little below the bottom of the block E'. Said ends 2^a have a vertical sliding movement on the punches 2.

Bolted to the upright C of the machine is a T-shaped piece 36, to which are bolted the depending arms 37, whose lower extremities turn inward and lie in the space between the bottom of the block E' and the bar 35, the length of said arms 37 being such that when the vertically-reciprocating sliding head E moves upward, carrying the punches 2, the said bar 35 will strike the ends of the arms 37 and be arrested, and by reason of the engagement of said bar with the sliding lower ends 2^a of said punches the body of the

punches, to which the perforating-punches *a* are secured which perforate the blank, will have a movement upward of greater extent than the lower part 2^a thereof, and the said plungers will therefore be drawn out of the blank, which will then be free to fall into the said carrier M, provided for it, and moved into position to receive it at the proper time. The descent of the punch far enough to cause the operation of the perforating-punches effects the engagement of the shoulders *c* on the punch part 2 with the upper end of the punch part 2^a, and said last-named part is then forced against the die 33, on which lies the strip of the stock J, thus cutting out the blank, and the return movement of the punch-block raises all of the above-mentioned parts whose relative positions remain unchanged until when near the upward limit of movement of the punch, where the bar 35, with which the part 2^a of the punch is connected, strikes the inturned end of one of the arms 37 and is thereby restrained against further movement, while the part 2 of said punch continues its upward movement far enough to cause the withdrawal of the perforating-punches *a* from the blank. At this point the lever *b'*, which bears on the top of the plunger *b*, comes into contact with the end of a rigidly-supported arm *d*, and the plunger *b* is thereby forced down through the end of the part 2^a of the punch while the punch part 2 is finishing its upward movement.

The punch construction proper and the means for operating it are fully described in my allowed application, Serial No. 664,616, filed simultaneously with this application. The above brief description of the parts thereof is thought to be sufficient for the purposes of this application.

The means provided for the proper disposition of the refuse stock after it has been operated on by the machine and for the disposition and separation therefrom of the finished blanks are as follows:

A receptacle N for the blanks is provided, which may be secured to the machine in any convenient manner. Said receptacle has a double bottom, the one, 38, forming the bottom for the blank-receptacle and the other, 39, located near said bottom 38 and extending beyond it somewhat toward the punches 2, forming a narrow passage 40, through which the punched-out strip of the stock J passes. Said receptacle N for the blanks may be provided with a gate at its lower end, through which the blanks may be drawn out into the boxes. The blanks are directed into said receptacle N from the punches by means of the carrier M, which has a movement imparted to it in a plane transverse to the movement of the punches 2 by means of a link connection with the vertically-sliding head E. Said carrier is somewhat longer than the gang of punches used on the press and is supported at each end by a stud 41, bolted to the upturned side thereof and on the free end of

which is a roller 42, (shown only in Fig. 4,) which lies in a groove 43, cut in the side of the support 43^a, which is bolted to the web D of the machine. Between the side of the said carrier M and the said support 43^a is one of two links 44 and 45, which connect said carrier to the sliding head E. Said link 44 by one end engages the stud 41, and the stud 46, which unites the opposite end of link 44 with one end of the link 45, projects beyond the side of said links and is provided with a roller similar to that on the stud 41 and lies in the groove 43 in said support 43^a. The opposite end of said link 45 is pivotally connected with the said sliding head E at 46^a. The said support 43^a is rigidly held in the position shown in Fig. 3, and the said groove 43 therein curves upward at its forward end at the point where the stud 46 comes to a stop when the carrier M is moved under the punches by the upward movement of the said sliding head E, and with said stud resting on the curved portion of the groove 43 the free movement of the links 44 and 45 to move said carrier on the commencement of the downstroke of the said head E is assured. The position of the said links 44 and 45 and said carrier M when the latter is in position under the punches is shown in Fig. 2. The position said links and the carrier occupy when the latter is pushed back to allow the punches to descend is clearly shown in Fig. 3.

A stop-motion is employed, as stated, to stop the machine as soon as the stock J is exhausted and is constructed as follows:

A rock-shaft 47 is supported in suitable bearings 48 on the aforesaid bar 16 of the carriage H, and on the end thereof which projects slightly beyond the end of the bar 16 an arm 48^a is secured, the free end of which is broadened out and has cut therein a depression 49, the bottom of which is parallel with said rock-shaft 47 and the sides of which are inclined to said parallel portion to form cams for acting against the edge of the lever 50 to disengage the latter from a hook engagement, which it has when the machine is in motion, at 51, with the fixed arm 52 secured to the machine, as shown in Figs. 1 and 2. A part of the edge of said lever 50 is cut away at the point 53, which lies opposite the depression 49, and the position of the edge of said lever 50 relative to the bottom of the said depression 49 is such that when the latter is opposite the cut-away portion 53 in said lever said arm 48^a, supported on the carriage H, may move transversely with said carriage without bringing in contact the said inclined edges of said depression 49; but should said arm 48^a be dropped, as shown in dotted lines in Fig. 2, so that the free end of the arm 48^a shall lie in a plane below said cut-away part then the transverse movement of said arm will cause one or the other of the inclined edges of said depression 49 to engage with said lever 50 and force it out of engagement with the fixed arm 52, as shown in dotted lines in said Fig. 2. The said arm 48^a is normally held in

the position shown in full lines in Fig. 2 by the finger 54 bearing against the under side of the stock J, secured to the end of the rock-shaft 47 opposite to that on which the said arm 48^a is secured, and its position is approximately in the middle of the strip of stock J being fed through the press, and it is held in contact therewith by a coiled spring 55, encircling the rock-shaft 47, and fixed by one end thereto and by its opposite end to the said carriage H. As long as there is stock in the machine the relative positions of the parts 48 and 50 (shown in Fig. 2) will remain unchanged. After the end of the strip of stock J has passed on beyond the end of the finger 54 the spring 55 operates to move said arm 48^a down to the position shown in dotted lines in said Fig. 2, when the following operations take place: The next transverse movement of the carriage will force one of the inclined sides (depending on which direction the carriage H takes) against the edge of the lever 50, forcing it out of its hook engagement with the fixed arm 52, as stated. Then the elbow-lever 56, pivotally supported on the machine at 57, will, by a spring 58 engaging said elbow-lever, cause the wedge-shaped end 59 thereof to swing toward the driving-shaft F and into the path of rotation of a part of the clutch mechanism before mentioned which is located on the said driving-shaft and engage with the hub of the driving-pulley G. The construction of this clutch mechanism is shown in Fig. 5 and is of a type usually employed in presses and analogous machines and consists in a bolt 60 in a suitable collar 61 on the driving-shaft F and a spring 62 for projecting said bolt out through the side of said collar into the path of one or more studs 63, let into the end of the hub of the driving-wheel, the said hub and said collar being located in contiguity on said shaft, the said pulley turning loosely thereon. On said bolt 60 is a boss 64, which projects at right angles therefrom through a slot in the face of the said collar 61, and when said bolt is in engagement with one of the studs 63 the said boss on the bolt 60 lies in close proximity to a flange 61^a on the end of the collar 61 next to the hub of said driving-pulley G. Into the space between the said boss 64 and the said flange 61^a the thin wedge-shaped end 59 of said elbow-lever 56 is thrust by the movement imparted to it by its spring 58, and as said wedge-shaped end of the lever 56 is so located that the direction of rotation of the shaft is always toward it it follows that the operation of said wedge will be to force back the bolt 60 into the collar 61, thus disengaging said bolt from the studs in the hub of the driving-pulley G, causing the machine to come to a stop. It may be started up again by drawing down the lever 50 and engaging it with the hook 51, assuming that there is a piece of the stock J in the machine for holding down the finger 54.

Should it be found desirable to so adjust

the upper part B of the press relative to its base that the plane of movement of the stock J therethrough shall be in a vertical plane or in a plane approaching the vertical, the reciprocating carrier for receiving the button disengaged from the punches might in that case be dispensed with, as at the angle above referred to which the upper part of the press would occupy the said disengaged buttons would fall clear of the machine into a receptacle placed to receive them.

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

1. In a punch-press for cutting out and forming flat buttons and analogous articles, a series of punches and dies, and means for reciprocally moving said punches against and away from said dies for cutting out and forming said buttons, means for temporarily attaching the cut-out buttons to said punches whereby they are raised above said dies, means for disengaging said buttons from said punches, substantially as set forth.

2. In a punch-press for cutting out and forming flat buttons and analogous articles, a series of punches and dies, feed mechanism for intermittently feeding a strip of stock between said punches and dies, and means for reciprocally moving said punches against and away from said dies for cutting out and forming said buttons, means for temporarily attaching said buttons to said punches whereby they are raised above said dies, means for disengaging said buttons from said punches, and a carrier intermittently interposed between said dies and punches for receiving said disengaged buttons, substantially as described.

3. In a punch-press for cutting out and forming flat buttons and analogous articles, a series of punches and dies, feed mechanism for intermittently feeding a strip of stock between said punches and dies, and means for reciprocally moving said punches against and away from said dies for cutting out and forming said buttons, means for temporarily attaching said buttons to said punches whereby they are raised above said dies, means for disengaging said buttons from said punches, and a carrier intermittently interposed between said dies and punches for receiving said disengaged buttons, and a stop-motion for stopping the press when the stock being fed there-to becomes exhausted, substantially as described.

4. A punch-press for cutting out and forming flat buttons and analogous articles consisting of a suitable frame, a vertically-reciprocating sliding head supported therein, means for moving said head; a series of punches supported in said sliding head, said punches consisting of two parts, one fixed in said head and the other movable vertically on said fixed part, a series of dies supported in said frame in line axially with said punches, means on the latter for raising the punched-out article above said dies, means for impart-

ing movement to the movable parts of said punches, relative to the fixed parts thereof, for disengaging said punched-out article therefrom, and a carrier for catching said disengaged article which carrier has a reciprocating movement across the line of movement of the said punches, and a connection between said punch-carrying head and said carrier for operating the latter, substantially as described.

5. A punch-press for cutting out and forming flat buttons and analogous articles consisting of a suitable frame, a vertically-reciprocating sliding head supported therein, means for moving said head; a series of punches supported in said sliding head, said punches consisting of two parts, one fixed in said head and the other movable vertically on said fixed part, a series of dies supported in said frame in line axially with said punches, feed mechanism for intermittently feeding a strip of stock transversely between said

punches and dies, means on said punches for raising the punched-out article above said dies, means for moving the movable part of said punches relative to the fixed parts thereof consisting of a bar extending transversely across the machine near the movable parts of said punches and engaging therewith, a rigid arm secured to the frame of the machine located to intercept the upward movement of said bar before said punches reach the limit of their upward movement, whereby said punched-out article is disengaged from said punch, a carrier for catching said article, which carrier has a reciprocating movement across the line of movement of said punches, and a connection between said carrier and the said sliding head for operating said carrier, substantially as described.

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