

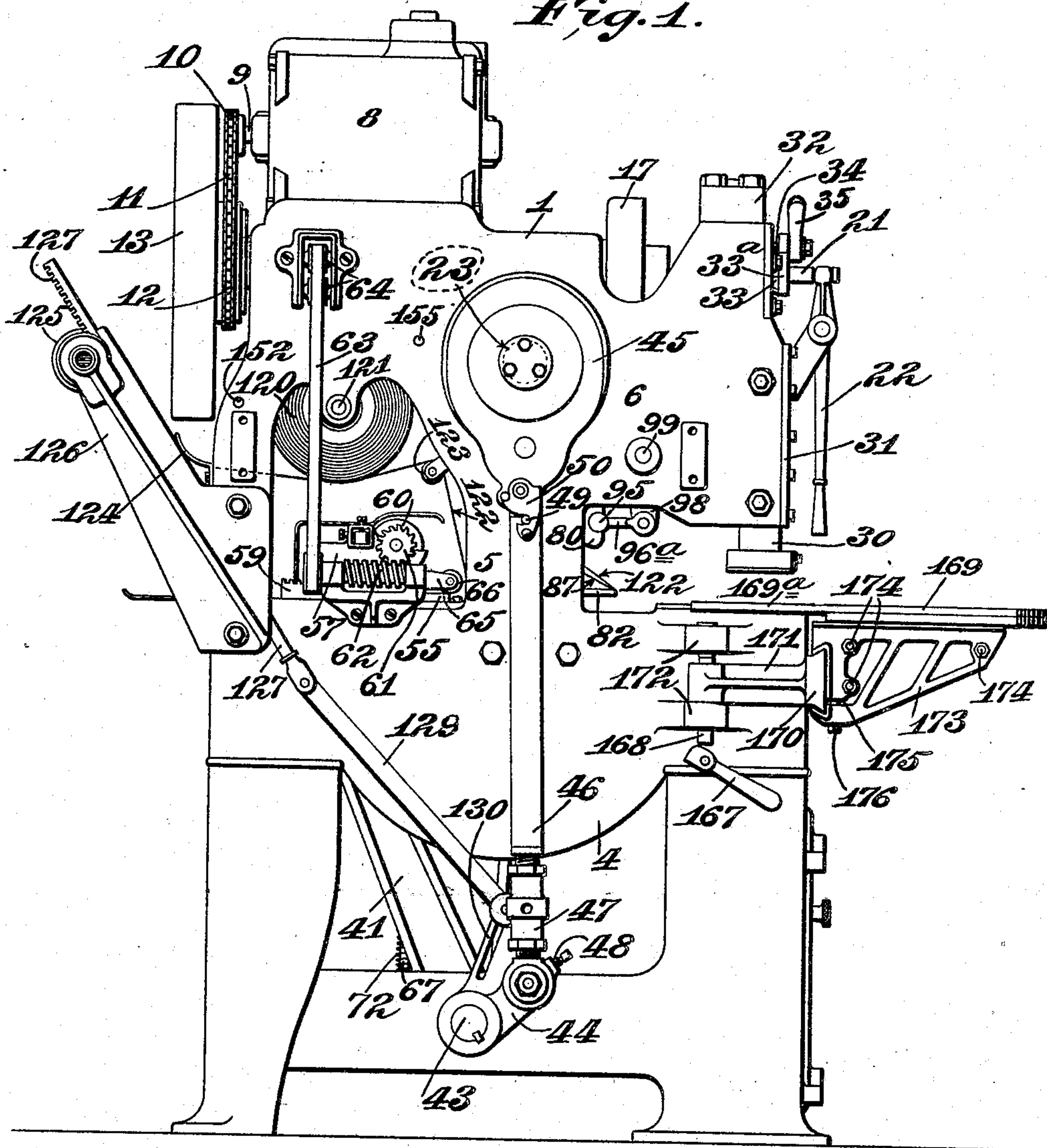
C. E. BROOKS.  
EMBOSSING AND PRINTING PRESS.  
APPLICATION FILED MAR. 31, 1908.

924,597.

Patented June 8, 1909.

13 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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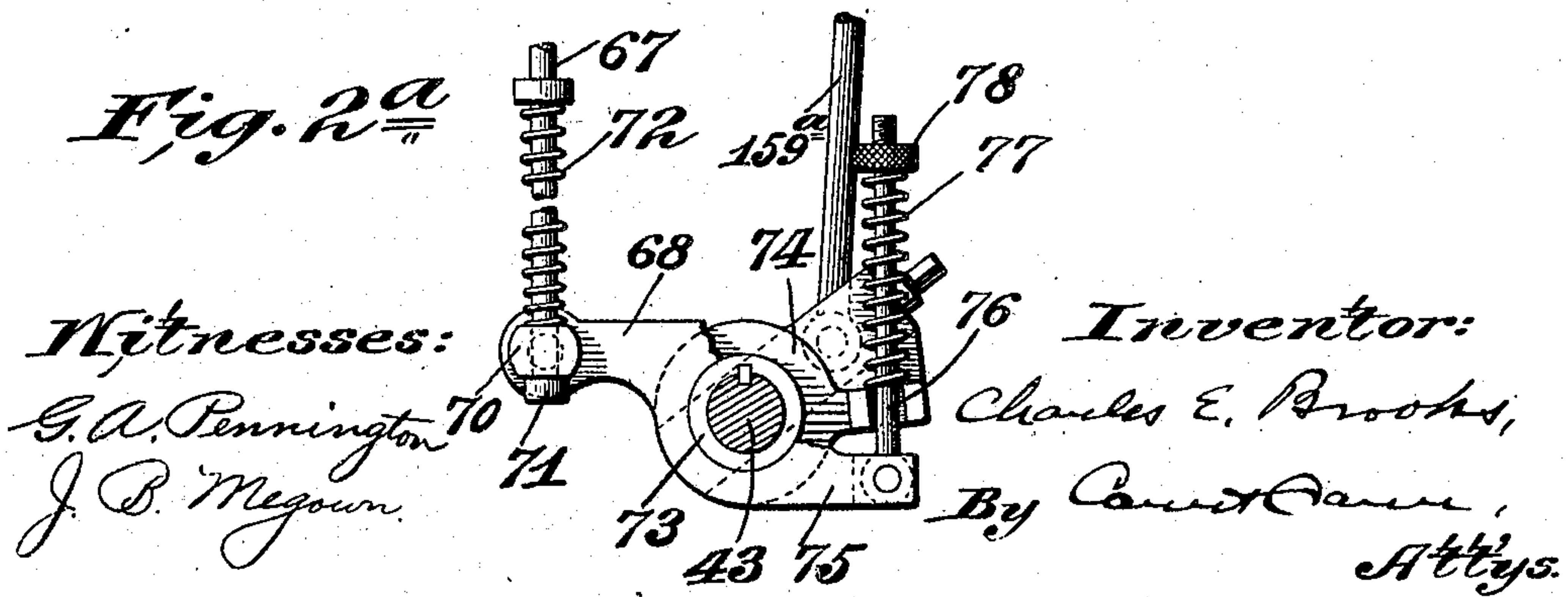
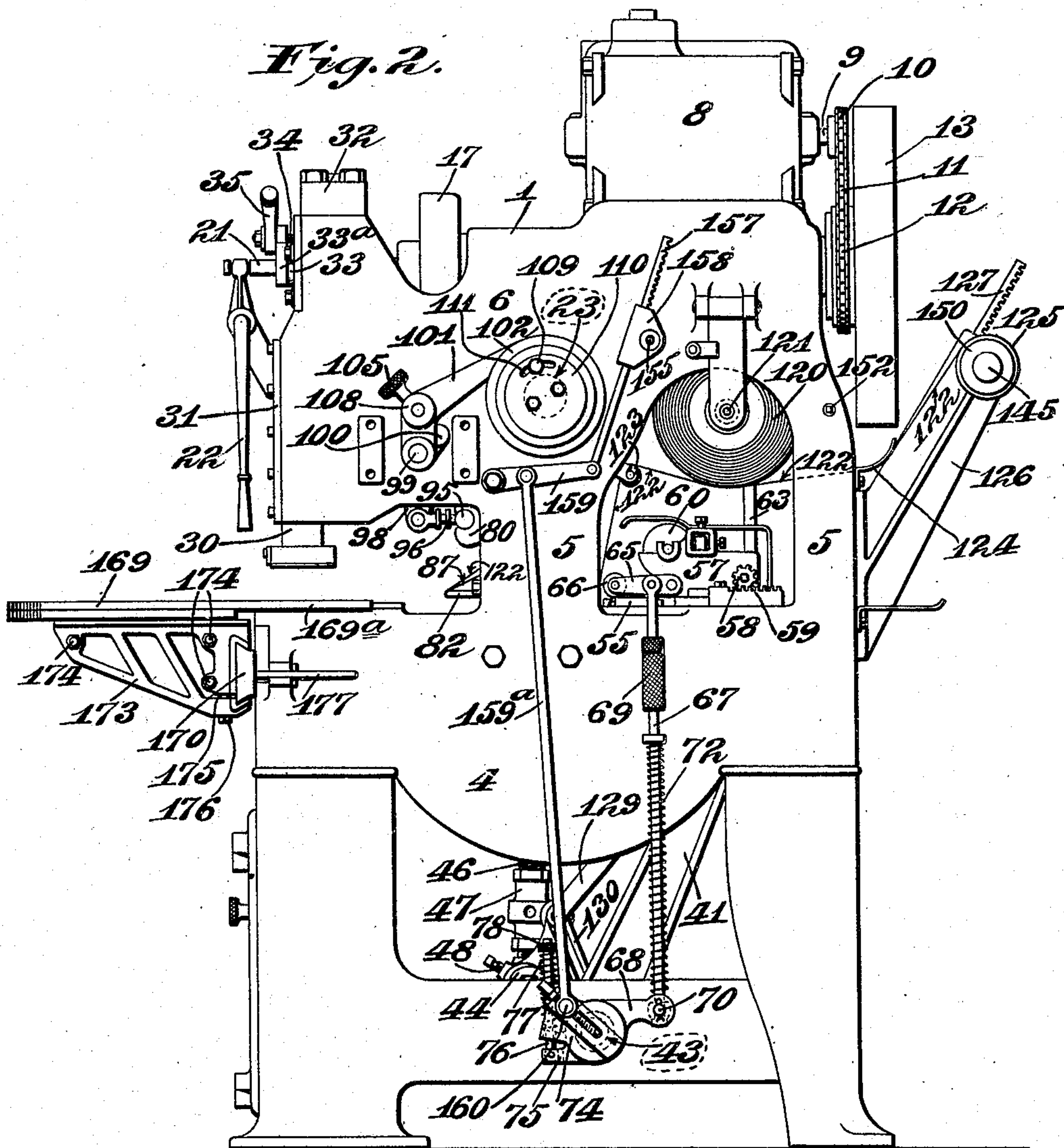
Charles E. Brooks,  
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13 SHEETS—SHEET 2.





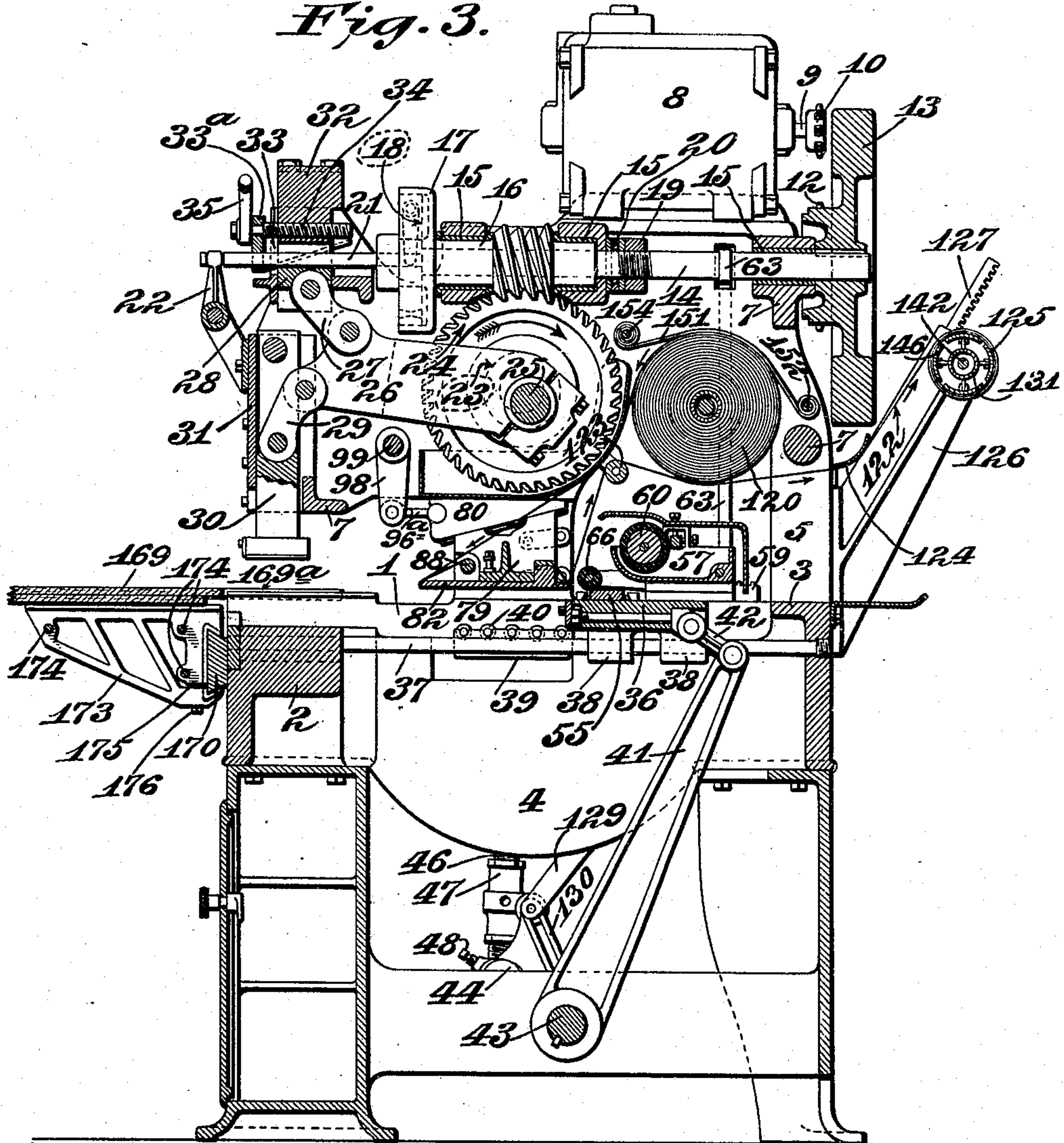
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13 SHEETS—SHEET 3.

Fig. 3.



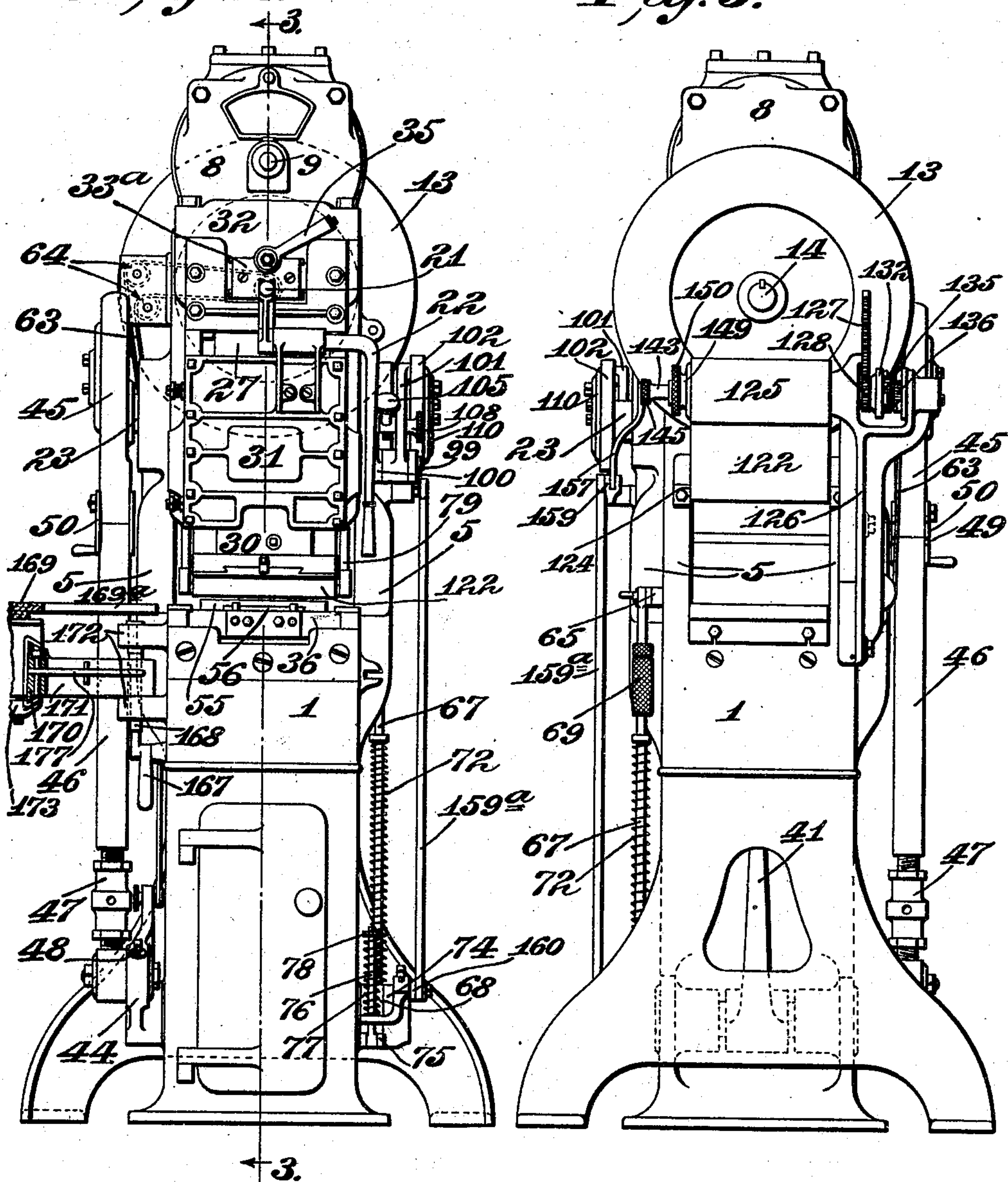
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13 SHEETS—SHEET 4.

*Fig. 5.*



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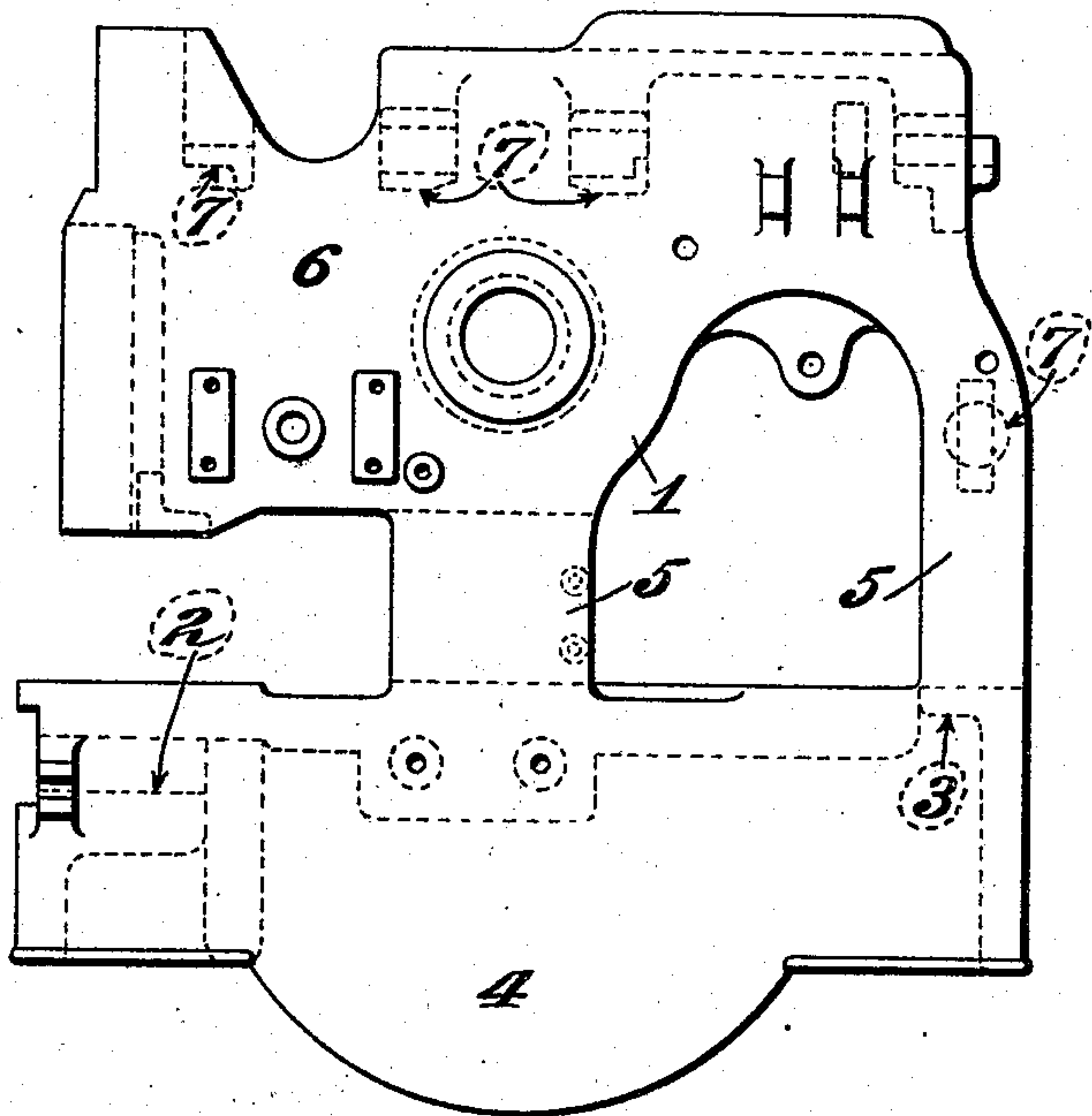


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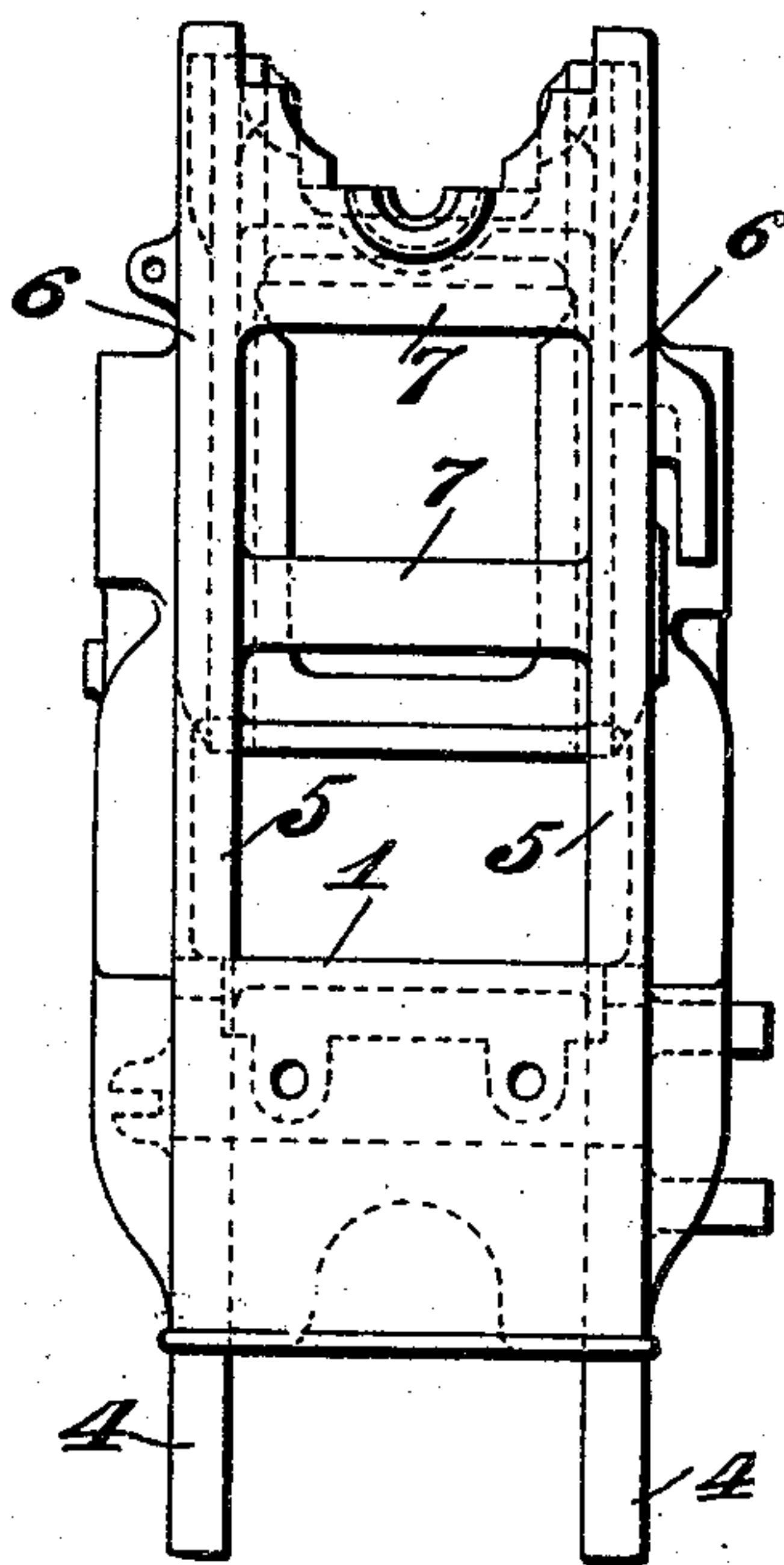
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13 SHEETS—SHEET 5.

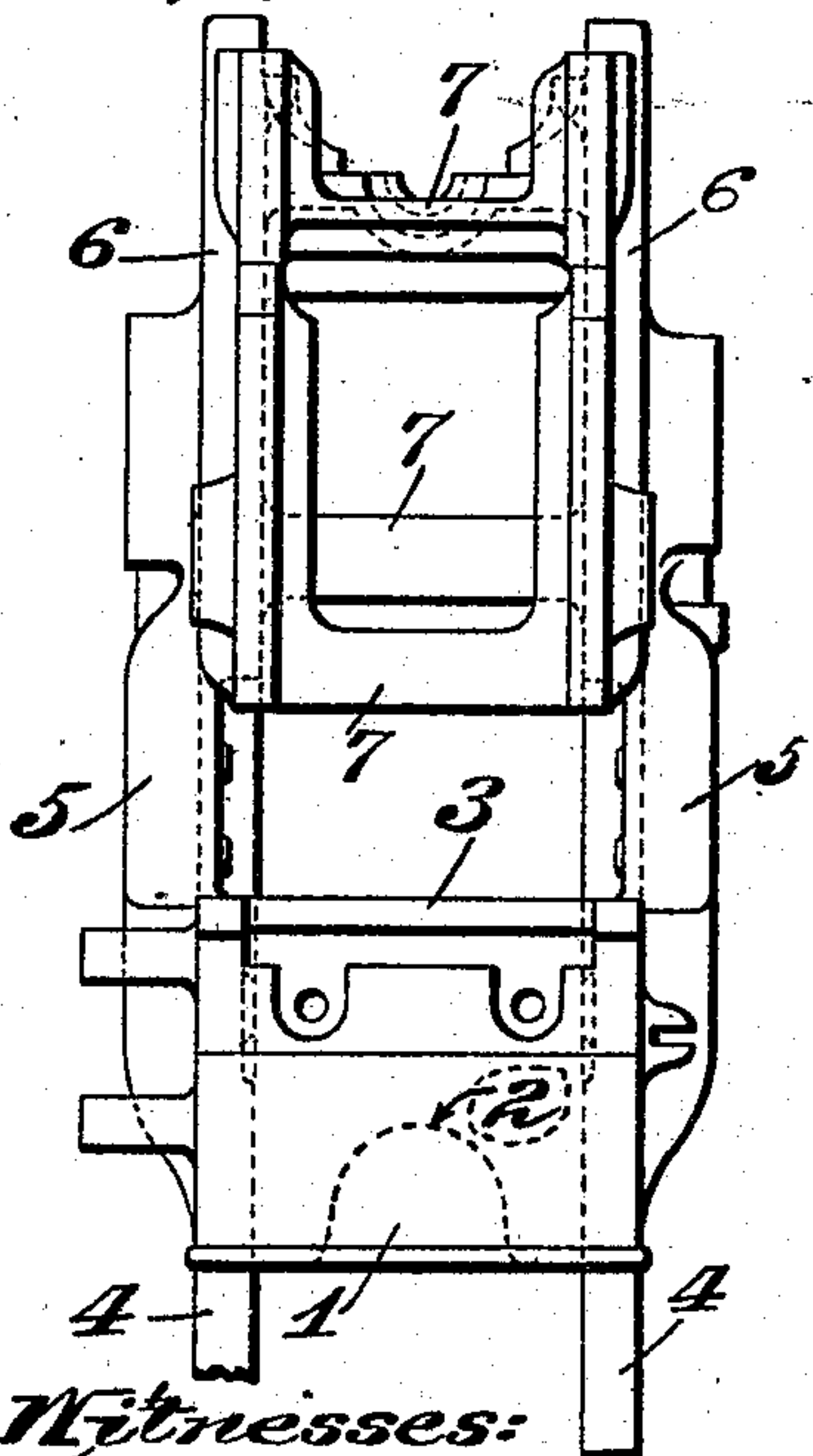
*Fig. 6.*



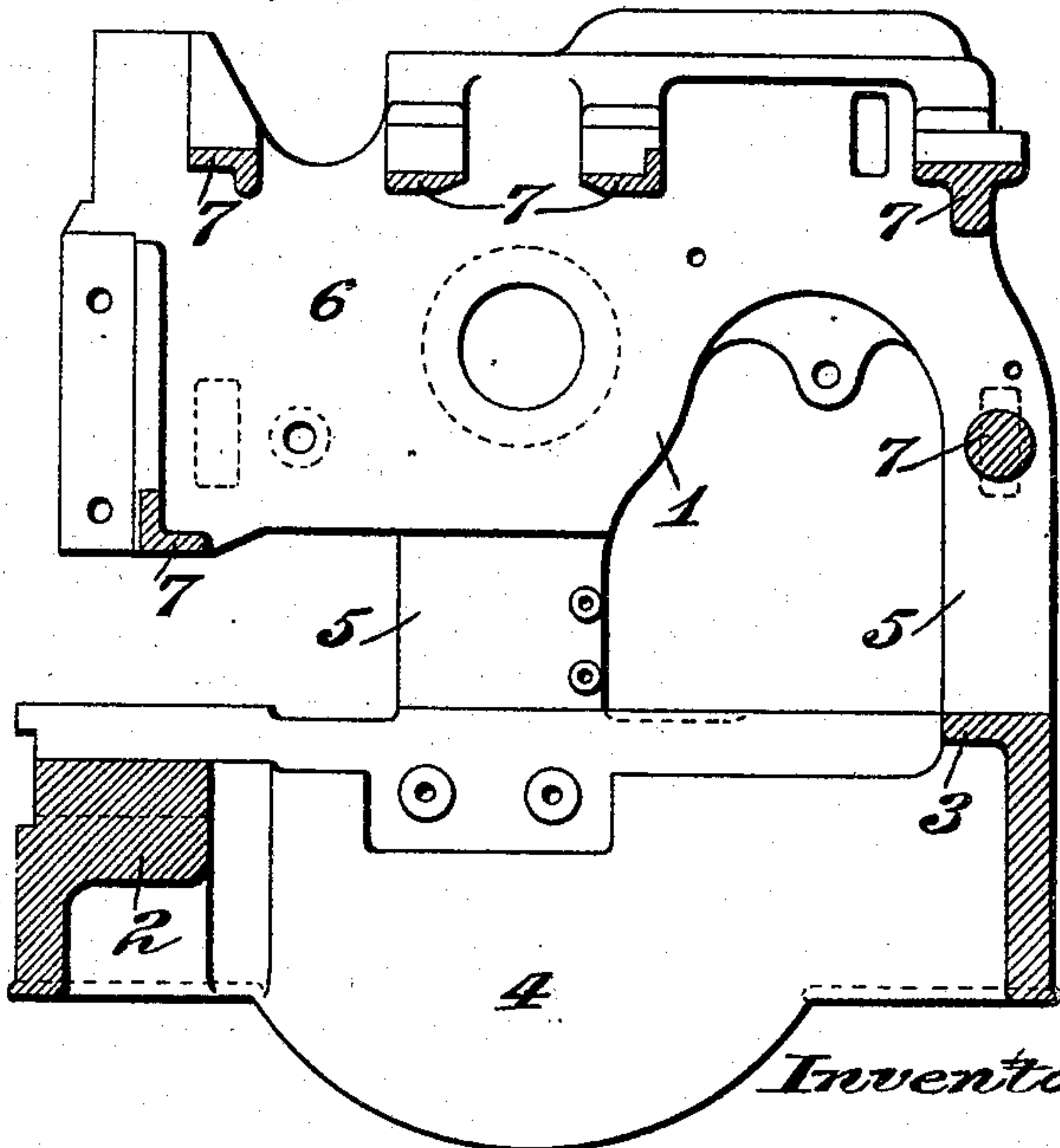
*Fig. 7.*



*Fig. 8.*



*Fig. 9.*



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*G. A. Pennington  
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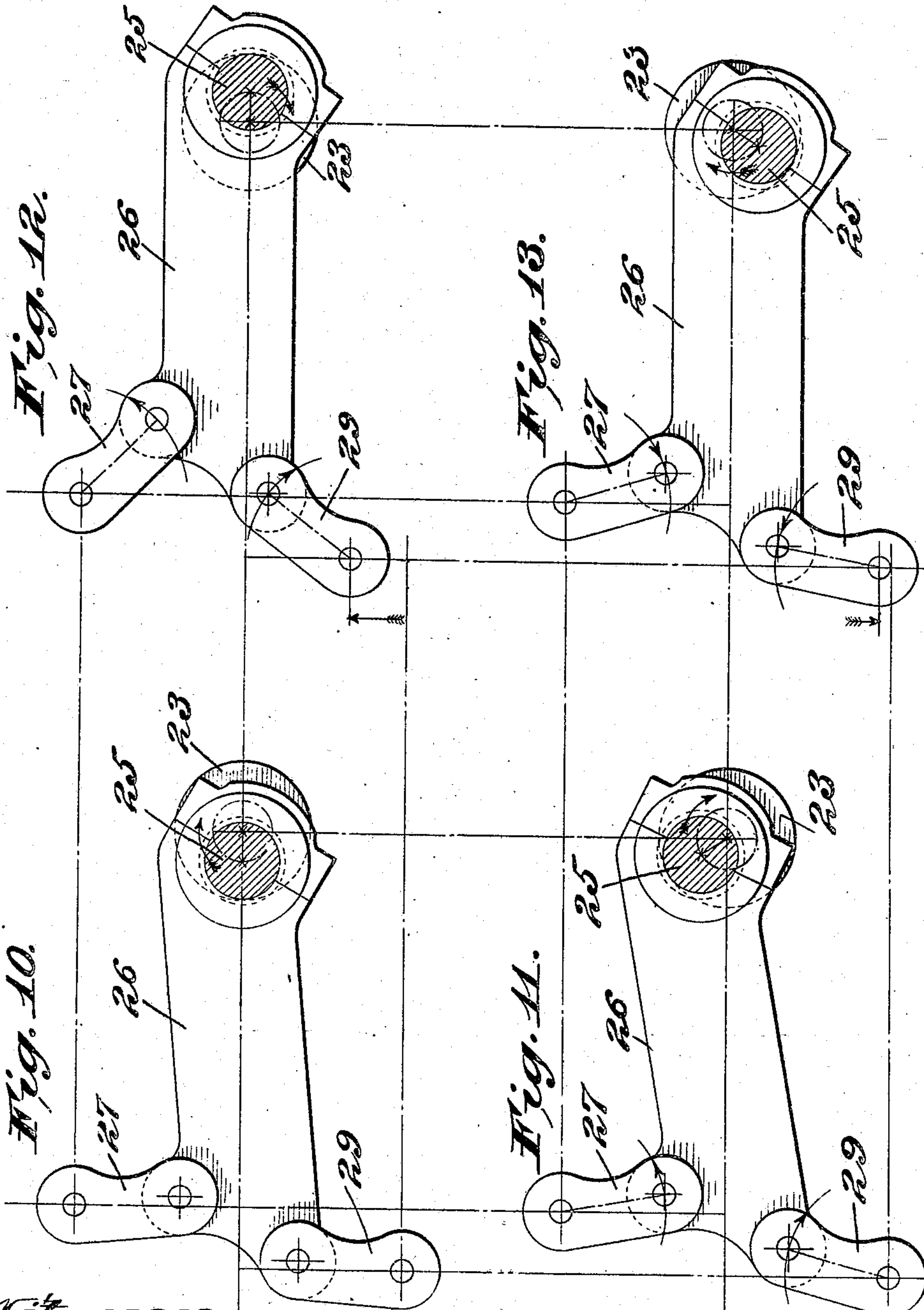
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EMBOSSING AND PRINTING PRESS.  
APPLICATION FILED MAR. 31, 1908.

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13 SHEETS—SHEET 6.



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924,597.

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EMBOSSING AND PRINTING PRESS.  
APPLICATION FILED MAR. 31, 1908.

Patented June 8, 1909.  
13 SHEETS—SHEET 8.

Fig. 17.

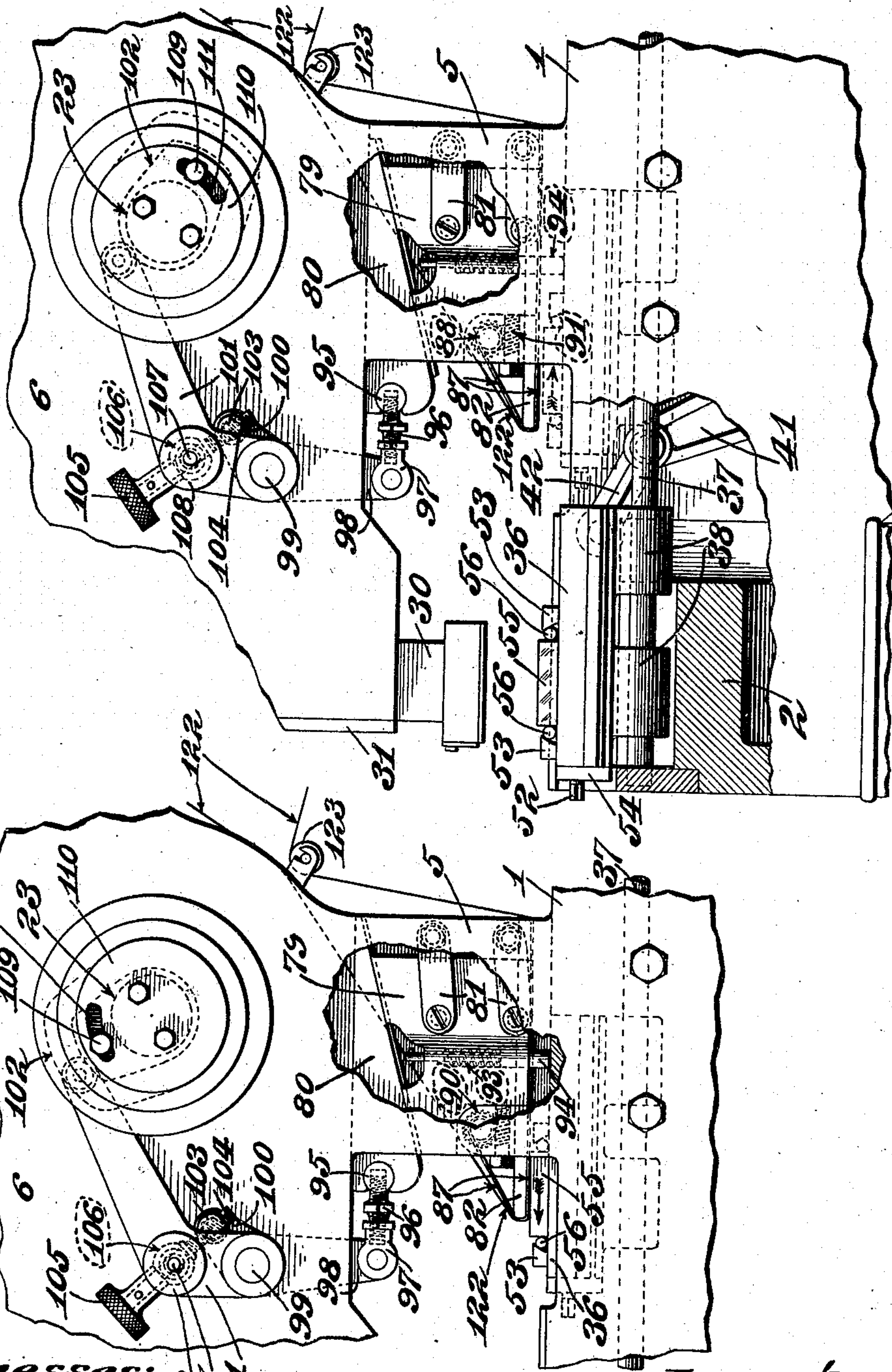
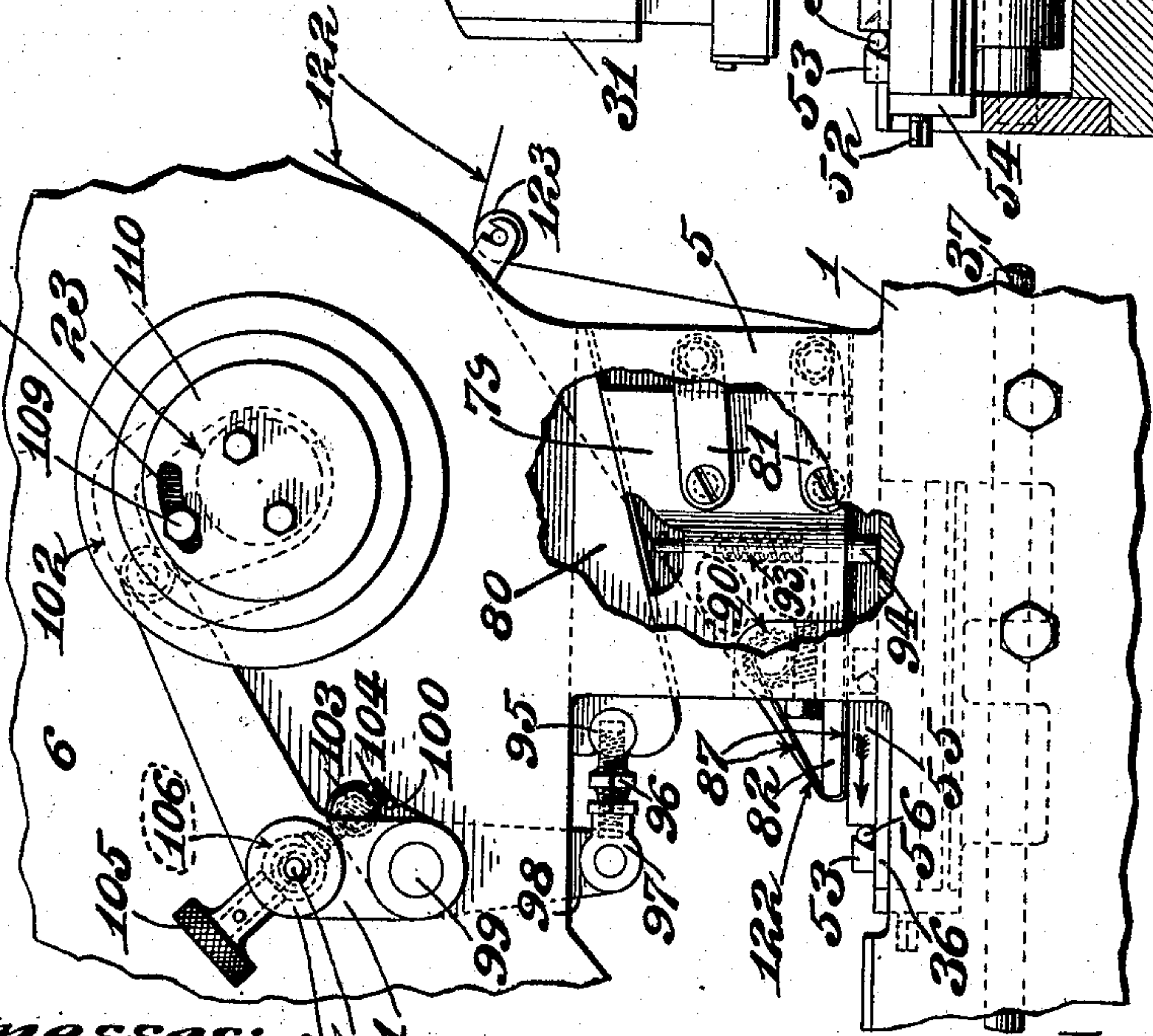


Fig. 16.



Witnesses:  
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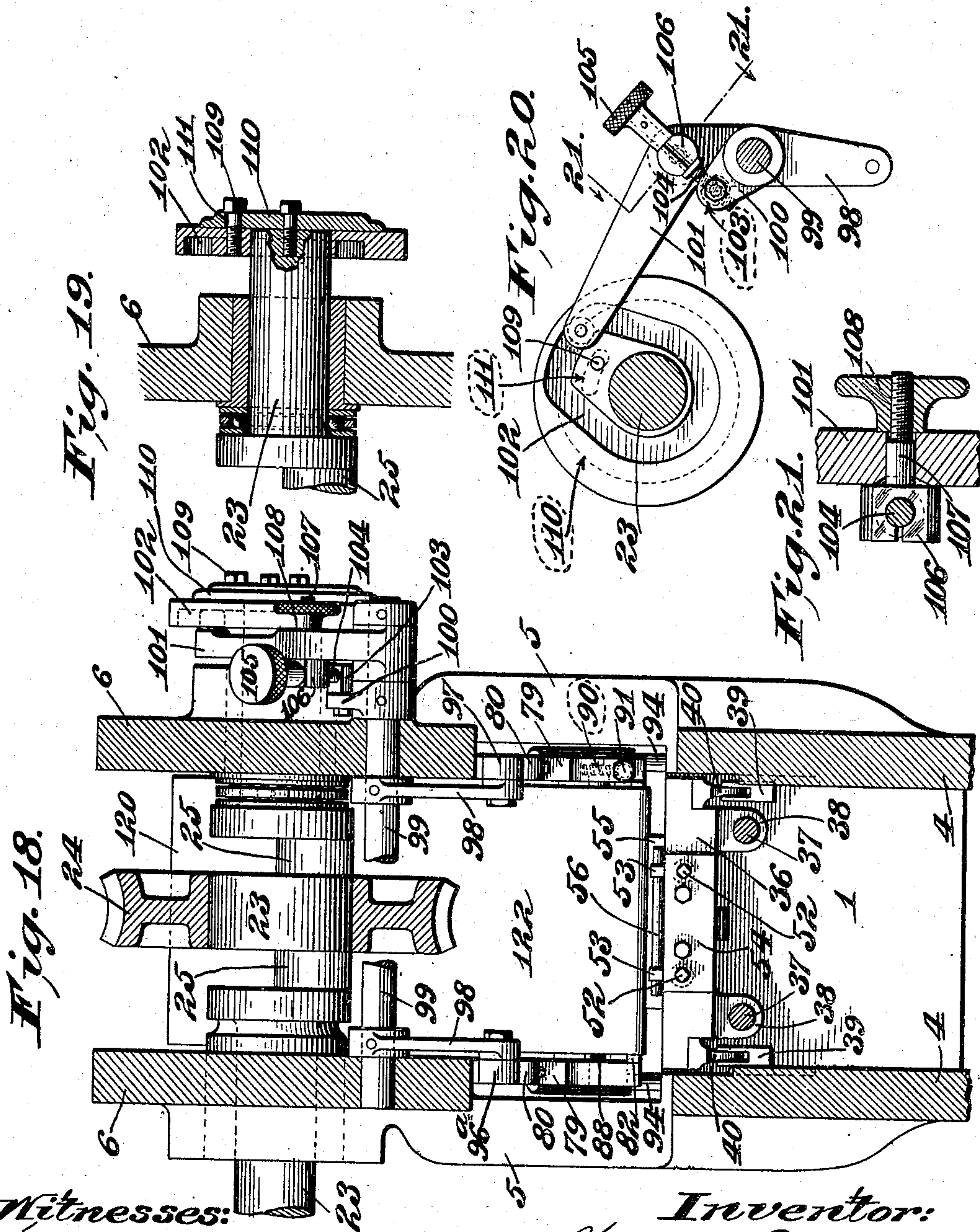
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924,597.

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EMBOSSING AND PRINTING PRESS.  
APPLICATION FILED MAR. 31, 1908.

Patented June 8, 1909.  
13 SHEETS—SHEET 9.



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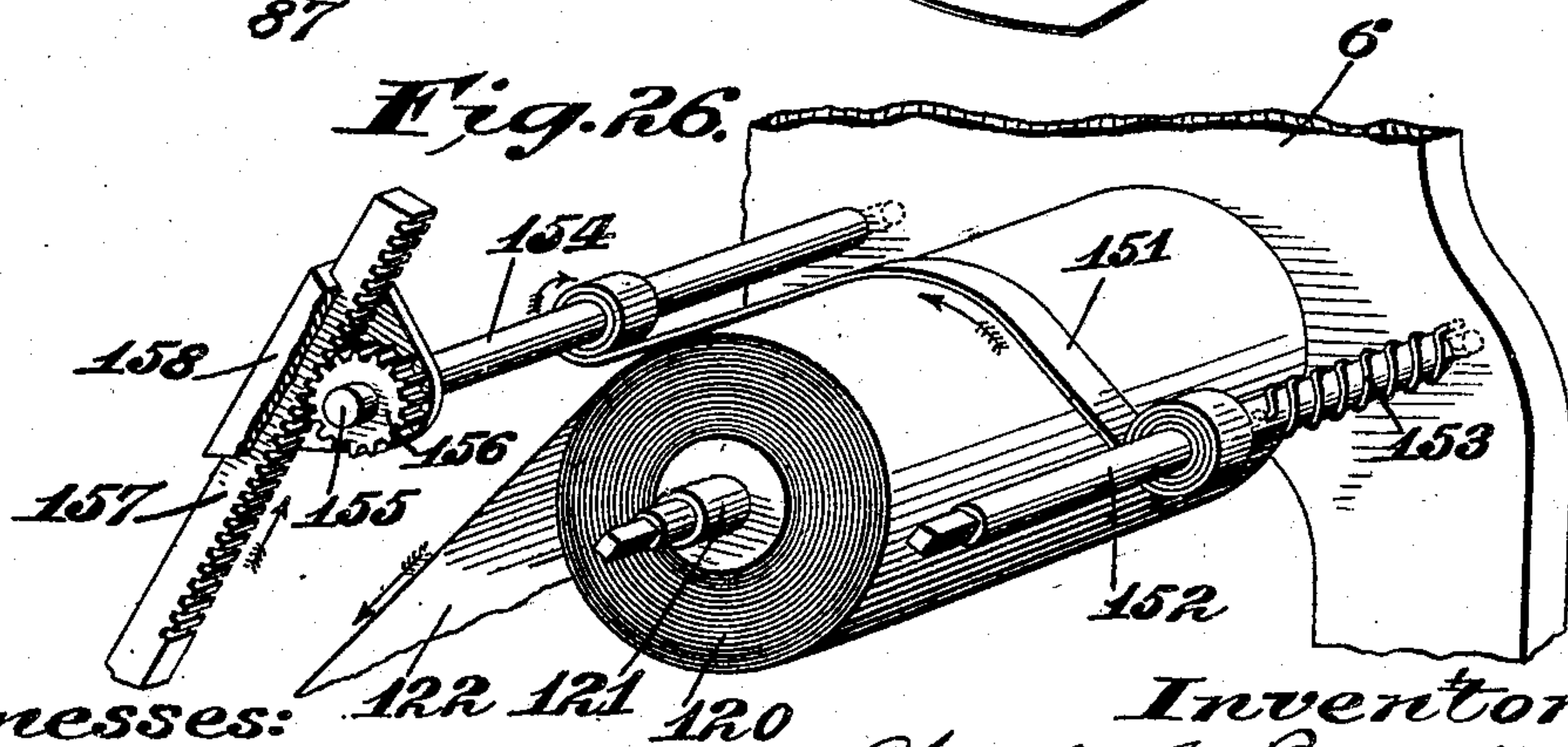
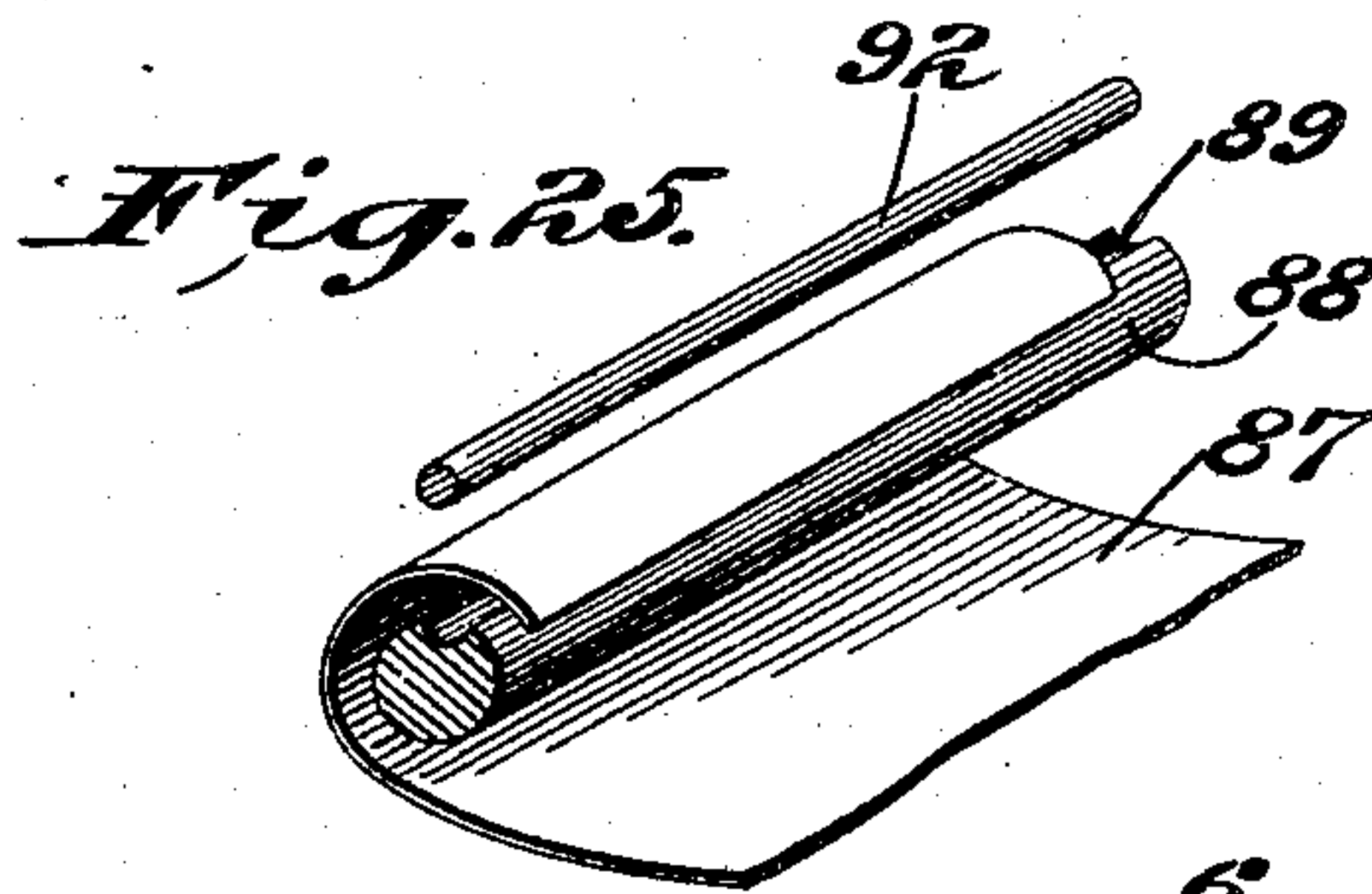
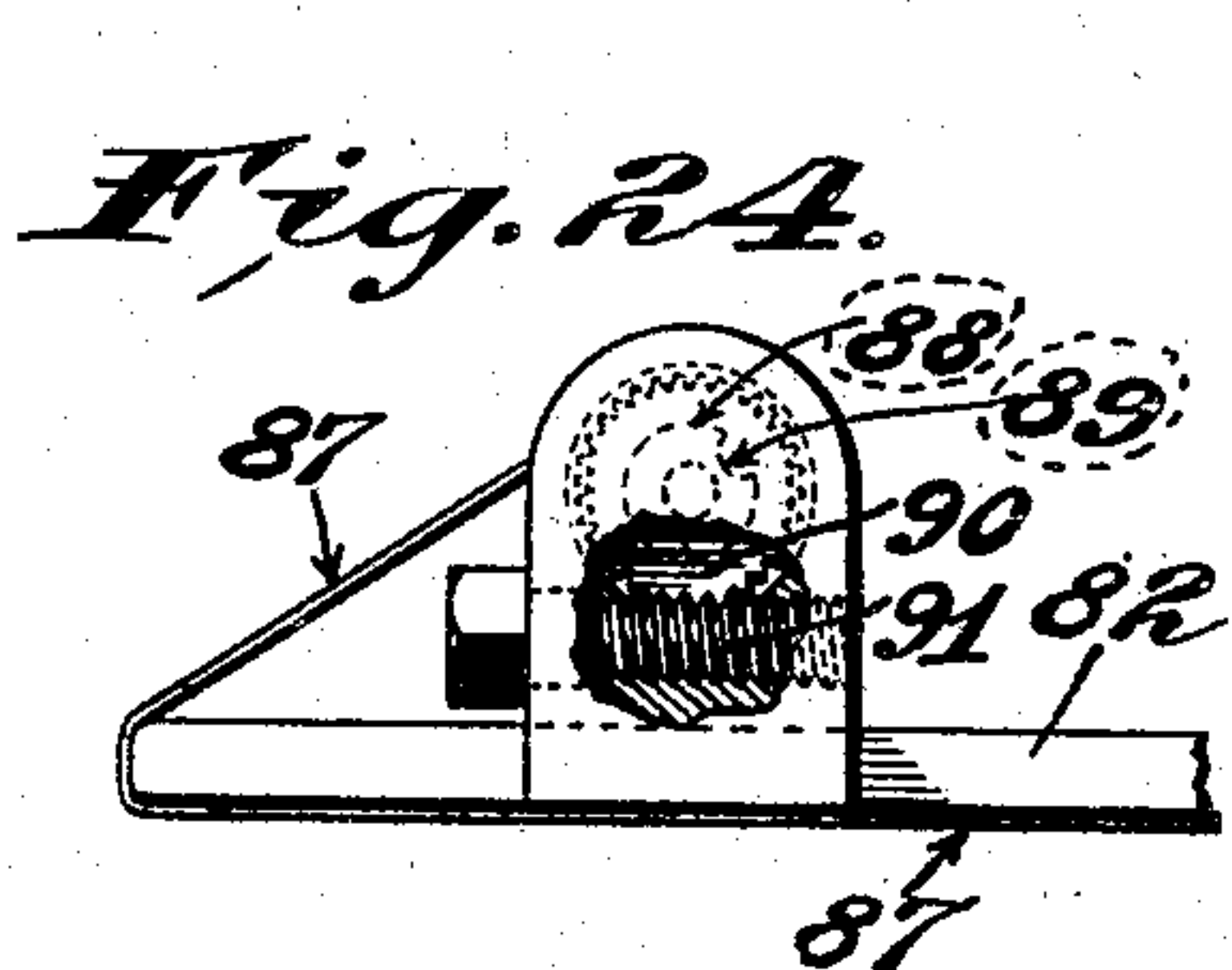
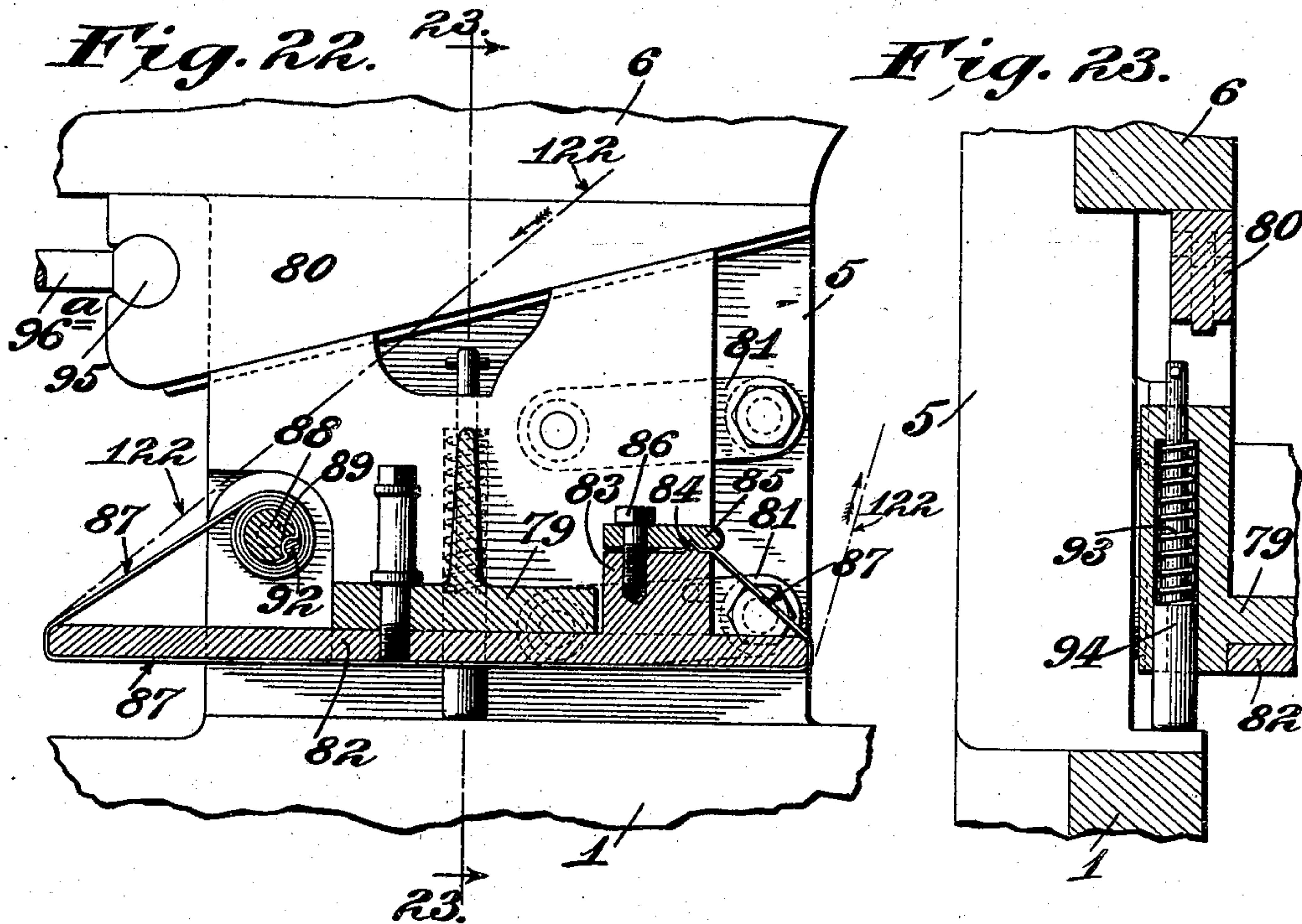
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924,597.

Patented June 8, 1909.  
13 SHEETS—SHEET 10.



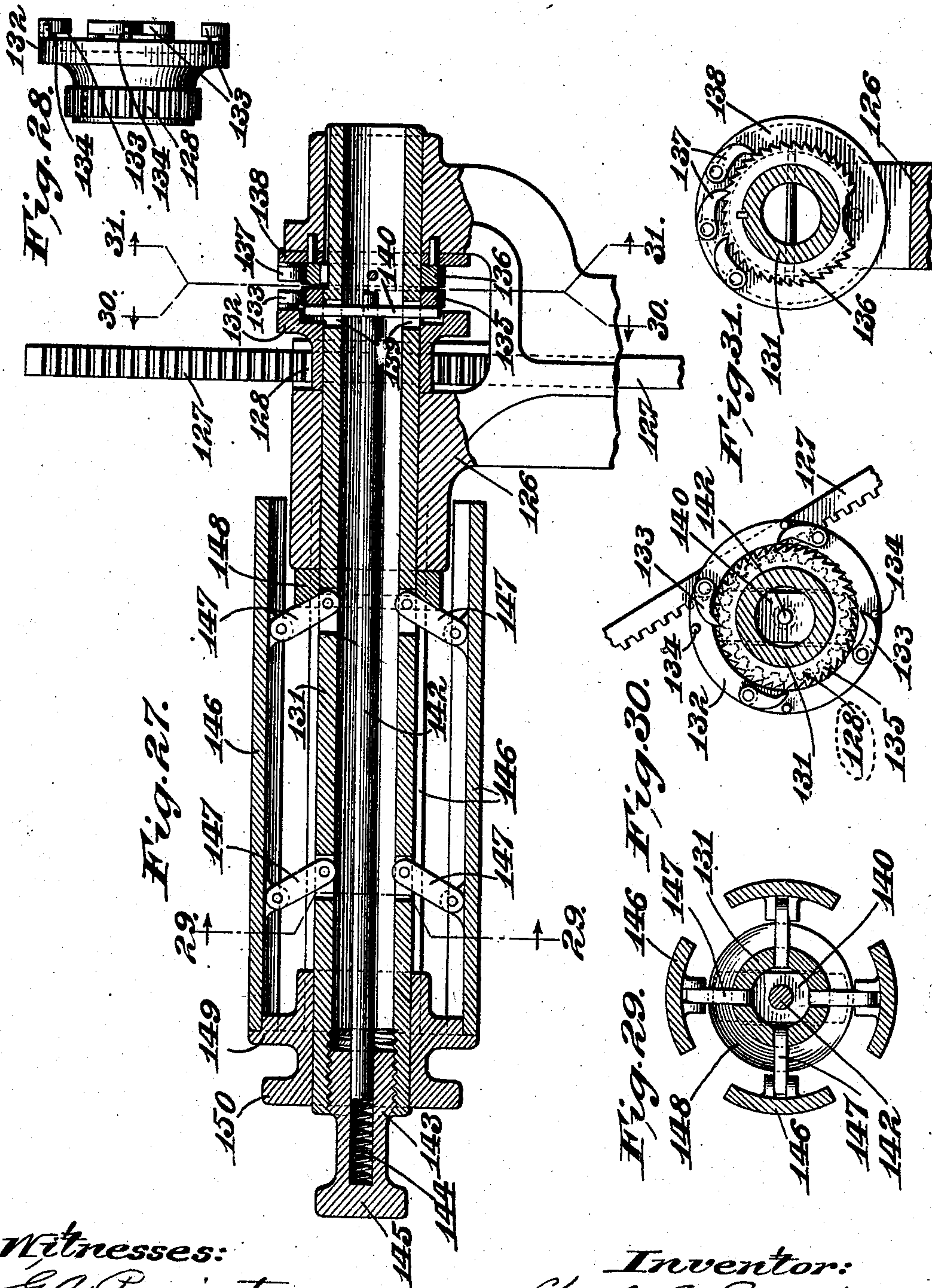
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924,597.

Patented June 8, 1909.  
13 SHEETS—SHEET 11.



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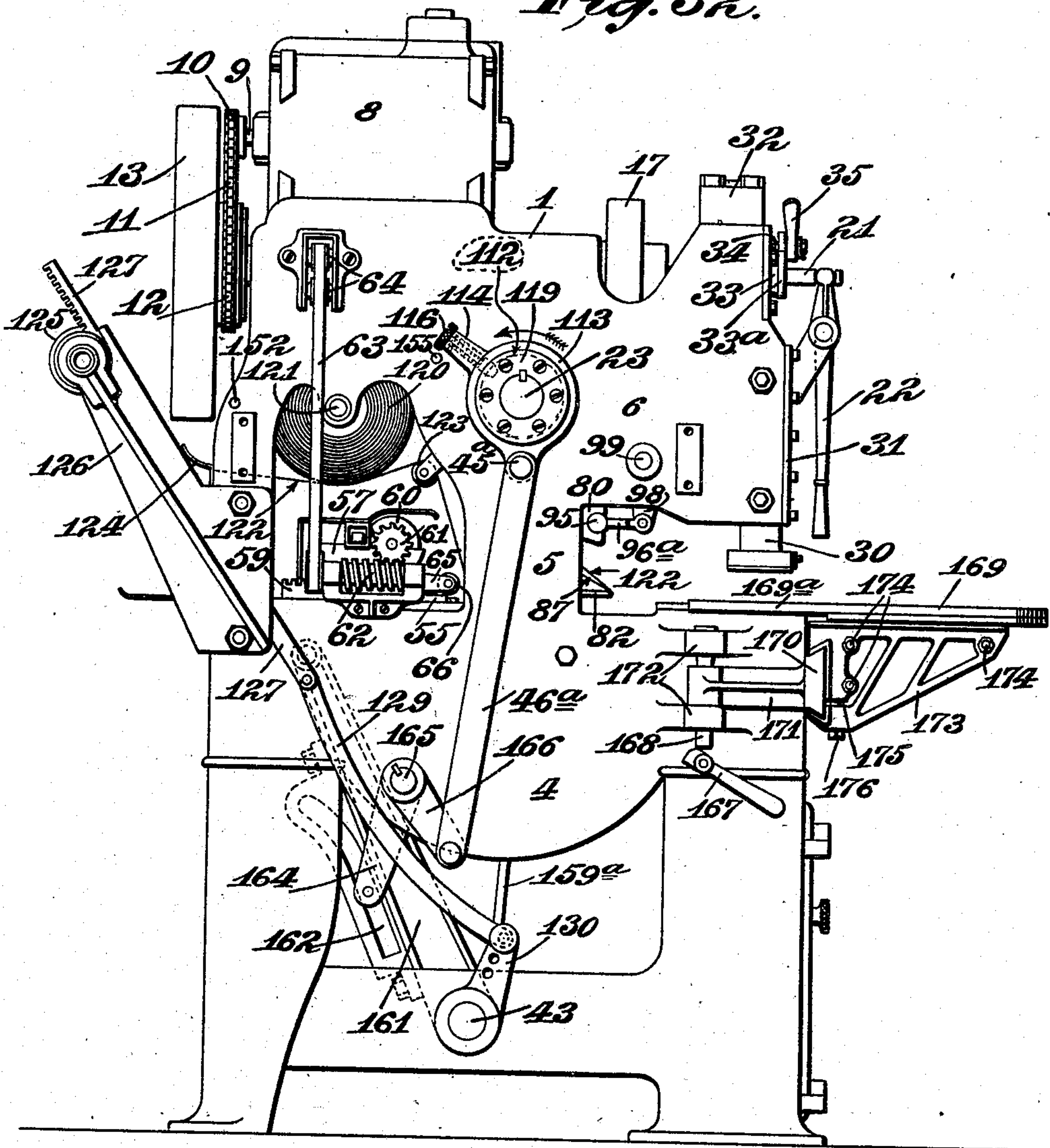
C. E. BROOKS.  
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APPLICATION FILED MAR. 31, 1908.

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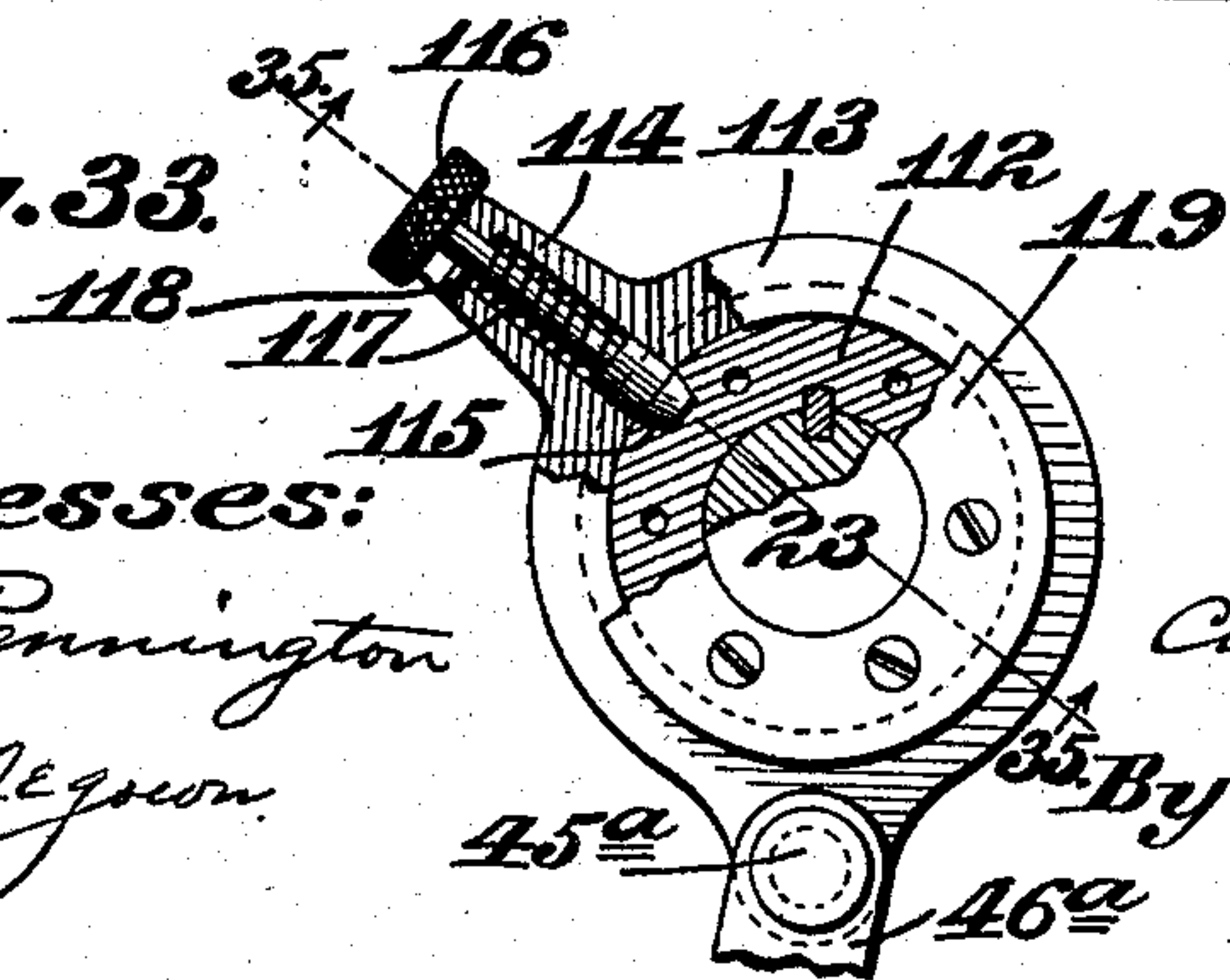
Patented June 8, 1909.

13 SHEETS—SHEET 12.

*Fig. 32.*



*Fig. 33.*



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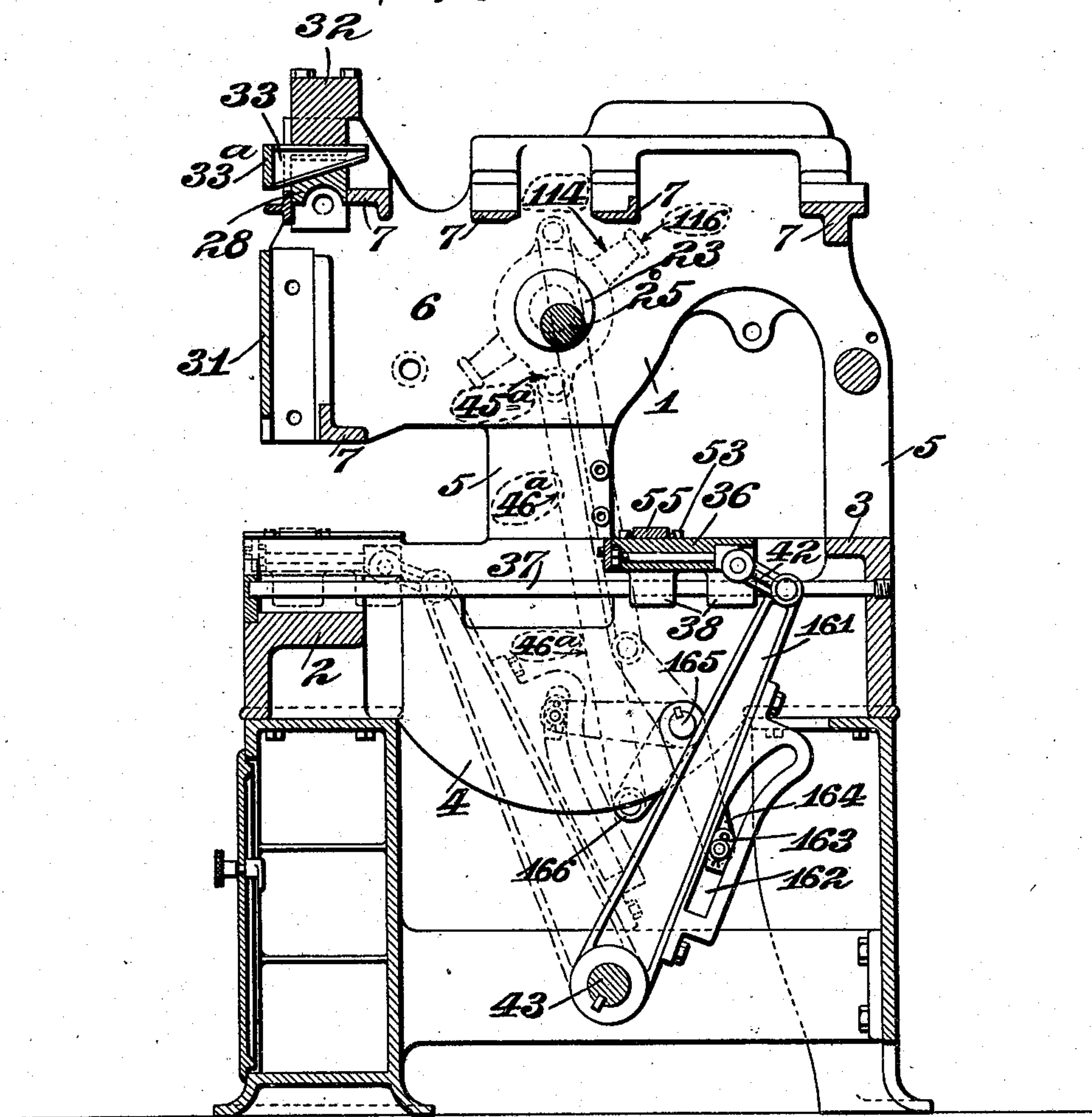


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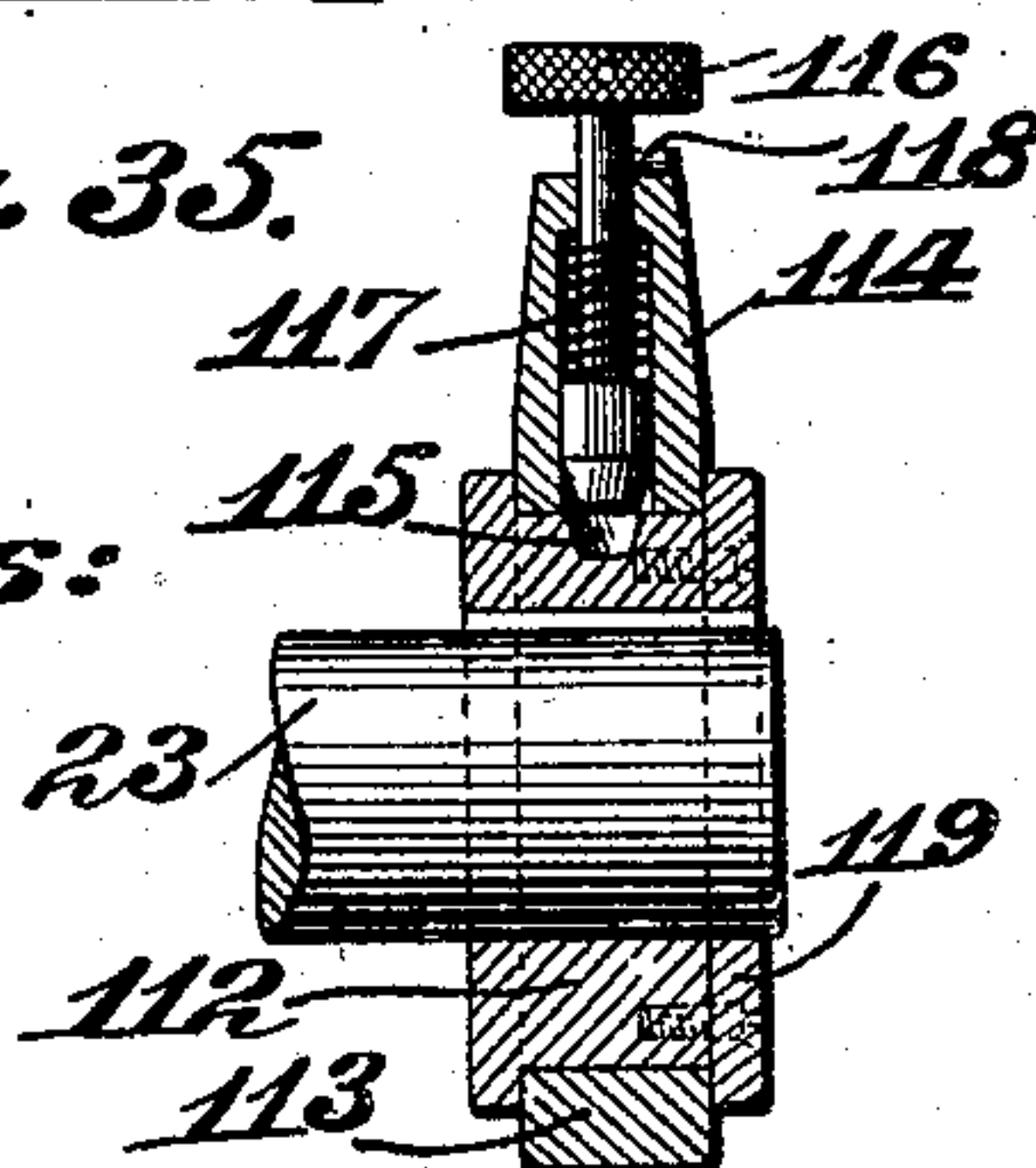
C. E. BROOKS.  
EMBOSSING AND PRINTING PRESS.  
APPLICATION FILED MAR. 31, 1908.

Patented June 8, 1909.  
13 SHEETS—SHEET 13.

*Fig. 34.*



*Fig. 35.*



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# UNITED STATES PATENT OFFICE.

CHARLES E. BROOKS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO B. ROTH TOOL COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

## EMBOSSING AND PRINTING PRESS.

No. 924,597.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed March 31, 1908. Serial No. 424,308.

*To all whom it may concern:*

Be it known that I, CHARLES E. BROOKS, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Embossing and Printing Presses, of which the following is a specification.

My invention relates to machines for embossing and printing, and has for its principal objects to secure compactness of construction; to make the frame an integral structure; to increase the width and depth of the throat; to cause a dwell of the die carrier during the operation of embossing; to maintain the pressure of the plunger for an appreciable period; to improve the movements of the die carrier, the inking mechanism, the waste paper winding mechanism and the wiping pad respectively; to provide for the adjustment of various parts; to simplify the construction and improve the precision and rapidity of operation of various parts; and to secure other advantages hereinafter appearing.

My invention consists in the construction and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings, which form part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure 1 is a view of the left hand side of a machine embodying my invention; Fig. 2 is a view of the right hand side of said machine; Fig. 2<sup>a</sup> is a detail view of the contrivance for varying the pressure of the die inking roller; Fig. 3 is a longitudinal vertical section of said machine on the line 3—3 of Fig. 4; Fig. 4 is a front elevation of said machine, with the table swung aside and partly shown in section; Fig. 5 is a rear elevation of the machine; Fig. 6 is a side elevation of the body frame; Fig. 7 is a rear view of said body frame; Fig. 8 is a front view of said body frame; and, Fig. 9 is a longitudinal vertical section of said body frame; Figs. 10, 11, 12, 13 are detail views showing different positions of the plunger actuating toggle mechanism; Fig. 14 is a horizontal detail of the die plate carrier and its trackway, showing the body frame in section; Fig. 15 is a longitudinal section on the line 15—15 of Fig. 14 of the body frame and die plate carrier, the trackway shown in elevation; Figs. 16 and 17 are detail views of the devices for operating the wiping pad; Fig. 18 is an enlarged

view of the devices for actuating the wiping pad, the body frame, worm gear and the trackway for the die plate carrier being shown in section; Fig. 19 is a sectional detail showing how the wiping pad actuating cam is mounted on the shaft of the worm gear; Fig. 20 is a view of the wiping pad actuating cam and of the rocker arm, and a portion of the power transmitting devices connected thereto; Fig. 21 is a sectional detail view on the line 21—21 of Fig. 20 illustrating the device for adjusting the position of the wiping pad mechanism; Fig. 22 is a vertical longitudinal sectional detail view of the wiping pad; Fig. 23 is a vertical cross sectional detail view of the end portion of the wiping pad, on the line 23—23 of Fig. 22; Fig. 24 is a detail view of the device for tightening the canvas of the wiping pad; Fig. 25 is a perspective detail view of the parts of the self-locking roll for the canvas tightening device; Fig. 26 is a perspective view of the mechanism for feeding the wiping paper; Fig. 27 is a vertical sectional view of the waste paper winding mechanism; Fig. 28 is a detail view of the gear and clutch element of the waste paper winding drum; Fig. 29 is a cross section of the winding drum on the line 29—29 of Fig. 27; Figs. 30 and 31 are sectional views taken on the same plane but looking in opposite directions, as indicated by the arrows in Fig. 27; Fig. 32 is an elevation at the left hand side of the machine embodying a modified form of die plate carrier movement; Fig. 33 is a detail view illustrating the device for disengaging the die plate carrier mechanism from the driving shaft; Fig. 34 is a longitudinal section view of the frame of the machine and of such portions of the mechanism as are necessary to illustrate the modification shown in Fig. 32; and, Fig. 35 is a sectional detail of the device shown in Fig. 33.

The body portion of my machine is preferably made as an integral casting 1 of the general form illustrated in Figs. 6 to 9. The general shape of the lower portion of this casting is that of a rectangular shell whose front and rear portions are reinforced by horizontal flanges 2, 3 and the middle portions of whose sides 4 are deepened. The upper portion of the casting is connected to the bottom portion thereof by vertical members 5 at the rear corners and also about mid-way of the sides. The upper portion of the casting comprises side members 6 which are



connected together by cross members 7 near the front, tops and rear. These cross members are preferably ribbed or flanged to adapt them to sustain the stresses which are transmitted to them.

On top of the body casting is mounted an electrical motor 8, whose armature shaft 9 is operatively connected to a worm shaft. Preferably, the armature shaft has a sprocket wheel 10 mounted thereon. Coöperating with this sprocket wheel is a sprocket chain 11 which likewise coöperates with a sprocket wheel or sprocket teeth 12 mounted on a hub of a fly wheel 13 which is fixed to a horizontal shaft 14. The fly wheel is located at the rear of the machine and its shaft extends forwardly through journal bearings 15 provided therefor on the cross members of the upper part of the body casting. Said shaft extends through a hollow worm or screw shaft 16 which is journaled in bearings provided therefor on the cross members of the body casting. Said screw gear has at its forward end a clutch member 17 that is adapted to coöperate with a movable clutch member 18 which is fastened to said shaft 14. The shaft 14, at the rear end of the sleeve of the worm is provided with a collar or shoulder 19 which works against an antifriction ball bearing 20 provided therefor on a cross member of the body casting. The movable member 18 of the clutch is controlled by means of a rod 21 which is adapted to reciprocate in suitable guides and is actuated by the arm of a hand lever 22 whose handle is adjacent to the front of the machine so as to be convenient for manipulation by the operator.

A transverse horizontal shaft 23 is mounted in journal bearings provided therefor on the side members of the upper portion of the body casting. This horizontal shaft is located above the vertical members 5 which support the upper portion of the casting midway of the sides thereof. Upon said horizontal shaft is fixed a worm gear 24 which meshes with the longitudinal screw shaft or worm 16. The shaft of the worm gear has two eccentric portions or crank arms 25 on opposite sides of said worm gear; and on each of these crank arms is pivotally mounted one leg of a bifurcated toggle bar 26 which extends toward the front of the machine. Upon the upper portion of the front end of this toggle bar is pivotally mounted an upwardly extending link 27 whose upper end is pivotally connected to an adjustable abutment piece or dead block 28 hereinafter more fully described. The lower portion of said toggle bar projects forwardly beyond the upper portion thereof and has a downwardly extending link 29 pivotally mounted thereon. This downwardly extending link 29 is pivotally connected to the middle portion of a plunger 30 which is mounted in a vertical guideway provided therefor in the front end

of the upper portion of the body casting. The front guideway consists of a plate 31 bolted to said body casting.

The bar 26, with the links 27, 29 pivotally connected thereto, constitutes a toggle which is actuated by means of the eccentric or crank shaft 23. As noted above, the two links are mounted on the toggle bar at unequal distances from the driving or crank shaft and at different elevations. The purpose of this arrangement is to cause a "dwell" or cessation of movement of the plunger at its lowermost position, notwithstanding the fact that the driving shaft is in continuous motion. The movement producing this result is illustrated diagrammatically in Figs. 10 to 13, showing the toggle mechanism at different phases of its action. Fig. 10 illustrates the toggle mechanism when the plunger 30 is in its lowermost position, which position corresponds to the forward limit of the stroke of the crank and of the toggle bar journaled thereon. Fig. 11 illustrates the position of the parts at the end of the "dwell" of the plunger, in which position, the shaft has advanced about one-sixth of a revolution from the position illustrated in Fig. 10. Fig. 12 illustrates the position of the parts when the shaft has advanced one half of a revolution from the position of Fig. 10, and Fig. 13 illustrates the position of the parts when the shaft is nearing the completion of its revolution. In all of these figures, the arrows indicate the directions of movement of the respective parts.

It is noted that in the lowermost position of the plunger 30, the lower pivot point of the upper link 27 is slightly closer to the shaft 25 than the vertical plane of the upper pivotal center thereof, and the distance between said first mentioned pivot point and said plane is hereinafter referred to as the horizontal displacement of the upper link center. It is also noted that the point at which the lower link 29 is attached to the toggle bar is closer to the shaft than the vertical plane of the pivotal center of the lower end of said link. The horizontal displacement of the upper link center is approximately the same as the horizontal displacement of the lower link center, so that the horizontal distances between the outer and inner pivots of the respective links lengthen or shorten simultaneously, as in the ordinary toggle joint. The tendency of this movement, as in the ordinary toggle joint, is to produce a continuous reciprocating movement of the plunger. It is noted, however, that by reason of the lower link being pivoted at a distance from the upper link and at a greater distance from the shaft 25 the end portion of the toggle bar operates like a toggle link or a lever of the first order to lower the point at which the lower link is mounted thereon.

The distance between the points at which



the two links are pivoted on the link bar is so proportioned that, throughout approximately one-sixth of a revolution of the shaft, the downward movement of the end of the toggle bar 26 practically neutralizes the tendency of the links to lift the plunger; that is to say, throughout this angular movement of the shaft, the vertical distance between the points at which the links are mounted on the toggle bar has increased by an amount equal to the sum of the decreases of the vertical distances of such pivot points from their outer pivotal centers respectively. In consequence of these proportions, the plunger is caused to "dwell" or remain in its lowermost position while the shaft travels through a considerable angle. In consequence of the foregoing arrangement, also, it is noted that, as illustrated in Fig. 12, when the plunger begins to rise, its upward movement is effected rapidly; and, as illustrated in Fig. 13, the initial portion of the downward movement is likewise rapid, while the latter portion thereof is effected slowly but with power.

As stated above, the abutment or dead block 28 of the upper toggle link is made adjustable. Preferably, this adjustment is effected as follows: The front of the body casting has a heavy bar or cross piece 32 mounted on the top thereof above the upper end of the upper toggle link. Against the underside of this cross piece bear adjusting pieces or wedges 33 whose lower surfaces are inclined and whose front ends are connected by a cross tie member 33<sup>a</sup> through which projects an adjusting screw 34 which engages with a threaded hole provided therefor in said cross piece 32. The projecting end of said adjusting screw is provided with a handle or lever 35 of the so-called "ratchet" type for turning the same and thereby causing the adjusting pieces or wedges to move inwardly or outwardly as desired. Against the lower inclined surfaces of adjusting pieces 33 bear the upper surfaces of the abutment piece or dead block 28 to which the upper toggle link 27 is pivotally secured. The upper surfaces of said abutment piece or dead block are inclined at the same angle as the lower surfaces of said adjustment pieces, so that said surfaces are adapted to bear against each other in all transverse positions of the adjusting piece. It is preferable to form grooves in the dead block cross pieces and ribs on the wedges to engage said grooves.

The front end of the lower portion of the body casting is in vertical alinement with the plunger and constitutes the anvil upon which the die carrier or table 36 rests or dwells during the operation of embossing and printing. On account of the heavy stress to which it is subjected, this anvil portion is heavily reinforced; and the rear end of the body casting is likewise heavily reinforced to take up the stresses transmitted thereto by the action of

the plunger. The die carrier or table 36 is supported and guided in its movement by means of horizontal rods 37 extending from the anvil to the rear of the machine and fitting in holes provided therefor in downturned lugs 38 mounted on the die carrier. In order to provide space for the travel of the die carrier, the sides of the lower portion of the casting are cut away forming horizontal shoulders near their tops. About midway of the sides, said shoulders are depressed, and above such depressions are mounted grooved plates 39 which constitute bearings for short antifriction rollers or disks 40. The upper portions of these antifriction rollers are arranged flush with the lower surface of the die carrier during the operation of wiping the die, as hereinafter explained.

The movement of the die carrier is effected by a rock arm 41 to which it is connected by a link 42. This rock arm 41 is fixed to a horizontal rock shaft 43 mounted transversely in the lower portion of the supporting frame or pedestal of the machine. This rock shaft 43 is operatively connected to the shaft 23 of the worm gear so as to receive motion therefrom and thereby harmonize the phases of the table movement with that of the plunger. As illustrated in Fig. 1, the rock shaft 43 has a rocker arm 44 fixed thereto which is connected to a crook pin 45 mounted on the shaft of the worm gear. In this construction, the pitman 46 is made of sections joined together by a turnbuckle 47 so as to make it extensible and thereby facilitate the adjustment of the limiting positions of the die carrier. It is preferable also to make the connection of the pitman to the rocker arm adjustable to vary the effective length of said rocker arm and thereby vary the stroke of the die carrier. This may be accomplished by mounting a block to slide longitudinally of said arm and providing a screw 48 to adjust the same.

In order to render the table movement inoperative when desired, it is preferable to connect the pitman to the eccentric strap by a separable fastening such, for instance, as a pin 49 fixed to the pitman and arranged to cooperate with a slotted latch 50 pivotally mounted on the eccentric strap in position to engage therewith.

The block which comprises the die carrier 36 has two slots or grooves 51 extending from the rear portion of the block to the front edge thereof. Extending lengthwise of each of these slots is a screw 52 having a right hand thread at one end and a left hand thread at the other end. On each end of each screw is a threaded locking member or jaw 53 consisting of a threaded block adapted to fit in the groove. Each of the threaded jaws has a portion which extends upwardly beyond the surface of the die-carrier block, and the inner face of this upwardly extend-



ing portion is undercut so as to form triangular grooves in said threaded jaws. The rear ends of the double-threaded screws are arranged to swivel in cylindrical sockets 5 provided therefor in the die-block, and the front ends of said double-threaded screws are reduced in diameter to fit and swivel in holes provided therefor in a plate 54 that is bolted to the front of the die carrier block. 10 The front ends of said double-threaded screws are squared to cooperate with a key or wrench. By this arrangement, the turning of a screw has the effect of moving the threaded blocks toward or away from each other to thereby act as a means for clamping 15 the die plate in position. For the purpose of clamping the die 55 in position, the undercut blocks are separated and the die is placed in the die carrier block between the clamping jaws. A short round rod 56 is 20 then laid along each side of the die, said rods being of such diameter that a diametral line drawn from its point of tangency with the inclined surface of the clamping jaw will have a considerable downward inclination. 25 By this arrangement, the tightening of the double threaded screws tends to roll said rods toward the die and exerts a downward as well as a horizontal force against the die. 30 The mechanism for inking the die comprises an ink-pan 57 slidably mounted near the rear of the machine and slightly above the die carrier or table. A transverse spindle is journaled or swiveled in the rear portion 35 of the ink-pan and is provided at or near each end with pinions 58 which mesh with racks 59 fixed on the body casting alongside of the guideways for said pan. One end of said spindle is squared to permit 40 it to be turned with a key or other suitable tool so as to adjust the position of the ink-pan.

The ink-pan roller 60 is journaled on the sides of the ink-pan near the forward end 45 thereof so as to be adjusted forwardly and backwardly with the ink-pan. One end of the shaft of the ink-pan roller projects beyond the side of the pan and is provided with a worm gear 61 which is arranged to engage 50 and cooperate with a horizontal screw or worm 62 arranged longitudinally of the machine. By this arrangement, the operative engagement of the worm gear with the screw is unaffected by the adjustment of the ink-pan shaft. 55 The movement of the ink pan roller is transmitted from the main screw shaft 14, preferably, by means of a belt 63, which passes over said shaft. The intermediate portions of the going and return sections of said belt pass over idle pulleys 64 60 journaled on the side of the body casting.

Pivotally mounted on the forward portion of the ink-pan at the respective sides thereof, are a pair of arms 65 on whose free ends is 65 mounted a roller 66 adapted to ink the die.

The pivot point of the arms which carry said inking-roller is below and slightly rearwardly of the axis of the ink-pan roller 60 so that said inking-roller may be inked thereby in the usual manner. 70

The movement of the die-inking-roller is effected by means of an extensible rod 67 pivotally connected to one of the arms at the side of the ink-pan and at its other end to a crank arm 68 loose with respect to the rock 75 shaft 43 located near the bottom of the framework or pedestal of the machine and constituting the means for transmitting motion to the die carrier. In order to provide for adjusting the length of said rod, it is 80 made in sections connected by a turnbuckle 69 whereby the timing of the stroke may be adjusted.

In the operation of inking the die, it is necessary for the inking roller to yieldingly or 85 resiliently press thereon, that is to say, it is necessary to make provision for the die inking roller to be forced upwardly above its normal position. For this purpose, the crank arm 68 has an eye-bolt 70 swiveled in 90 the end thereof through which the lower end of said extensible rod 67 extends. The end-most portion of said rod is provided with an enlarged head 71 which limits the upward movement of the rod relative to said crank 95 arm; but otherwise said rod is free to slide in said eye-bolt. The extensible rod is surrounded by a coiled spring 72 whose lower end bears against the eye-bolt and whose upper end bears against the end or shoulder 100 provided therefor on the rod, whereby the spring normally presses said rod upwardly. The crank arm 68 to which said rod is connected is itself swiveled or journaled on the hub 73 of a second crank arm 74 that is fixed 105 to the rock shaft 43 by a key or otherwise. Said first mentioned crank arm 68 has an arm or portion 75 which projects on the opposite side of the rock shaft and has a short rod 76 pivotally connected thereto. This 110 rod projects upwardly through a hole in the fixed crank arm 74 and is threaded at the end. Surrounding said rod is a coiled spring 77 whose lower end bears against the fixed arm and whose upper end bears against a 115 knurled nut 78 that cooperates with the threaded end of said rod and constitutes a means for regulating the pressure thereon. By this arrangement, the movement of the rock shaft 43 is transmitted to the die inking 120 roller and the transmitting devices are adapted to yield when the roller has reached the limit of its stroke. The pressure on said roller, however, may be varied, as desired.

Located above the middle portion of the 125 path of the die carrier is a wiping pad. The body member of the wiping pad is an integral casting 79 comprising a horizontal portion, vertical end portions, and a vertical stiffening rib connecting the end portions. 130



The upper surfaces of the ends are inclined to cooperate with the wedge blocks 80 hereinafter mentioned. To each of the vertical end portions of the body member are secured a plurality of parallel links 81 of equal length, which are likewise pivotally mounted on the framework, whereby the wiping pad is capable of moving upwardly and downwardly without changing its horizontal alignment. Through the horizontal portion of the body member extend screw bolts which serve to clamp the face plate 82 firmly to the body member, the lower surface of said face plate being horizontal.

On the upper surface of the face plate near one end is a raised portion 83 whose upper surface is provided with a triangular rib 84. A plate 85 having a groove in its lower surface constitutes a counterpart for the upper surface of said raised portion and is removably secured thereto by means of screws or bolts 86. This contrivance constitutes a means for firmly clamping the edge of a strip of canvas 87, which passes around the edge of the face plate and the lower surface of said face plate and has its opposite end securely held in place. For this purpose, a shaft 88 is journaled in uprights provided therefor on the face plate. The middle portion of the shaft is enlarged to constitute a drum and the periphery thereof has a longitudinal groove 89 of semicircular section therein. The projecting end of the shaft is provided with a worm gear 90 which is adapted to cooperate with a screw worm 91 provided therefor on the upper surface of the face plate. In practice, the end of the canvas strip is passed over the groove in the drum and then a circular rod 92 of a size to fit the groove, is laid endwise in the groove with the canvas intervening between them. The canvas is then wound around the drum and said locking rod, and the stronger the pull thereon the more firmly the canvas is clamped. By this arrangement, an old canvas may be removed and replaced, and slack and wrinkles may be removed.

In the vertical end portions of the body member of the wiping pad are formed vertical pockets in which are coiled springs 93. The upper ends of said springs bear against the end walls of the pockets and the lower ends of said springs bear against the shoulders of pins 94 whose lower portions fit said pockets but whose upper portions are of reduced diameter and extend through said springs and through guide holes provided therefor at the ends of said pockets. The lower ends of said pins bear against horizontal shoulders provided therefor on the body casting. By this arrangement, the springs tend to hold the wiping pad in its uppermost position.

As stated above, the upper surfaces of the vertical ends of the body of the wiping pad

are inclined and grooved to cooperate with wedge blocks 80, whose lower surfaces are provided with ribs that are the counterpart of the grooves in the wiping pad. These wedge blocks have an inclined lower surface and a horizontal upper surface, the upper surface being arranged to slide on smooth horizontal shoulders provided therefor on the body casting. In the wide end of each of the wedge blocks is formed a circular socket in which fits a disk or circular block 95 constituting a swivel joint. One of the disks has a threaded hole therein in which works a short rod 96 whose other end is reversely threaded and cooperates with a threaded link 97 pivotally mounted on the end of one of two arms 98 which are fixed to a rock shaft 99 journaled in the main frame. Fixed to the end portion of said rock shaft 99 is another arm 100; and still another arm 101 is loosely journaled on said rock shaft but is adjustably fastened to said arm 100. The outer end of the loosely journaled arm 101 is arranged to cooperate with a grooved cam 102 fixed on the main worm shaft 23. By this arrangement, the movement of the cam 102 is transmitted to the rock shaft 99 and from the rock shaft through the adjustable links 96 and 96<sup>a</sup> to the wedge blocks 80. By manipulating the adjustable link 96, the positions of the wedge blocks with respect to each other may be varied, as may be desirable in case the die plate is thicker at one end than at the other. The companion rod 96<sup>a</sup> may be directly pivoted to its respective rocker arm 98, or adjustably connected thereto similarly to the connections of rod 96.

As stated above, the fixed arm 100 of the rock shaft 99 is adjustably connected to the loosely journaled arm 101 which cooperates with the cam 102. A suitable device for effecting this adjustment is illustrated in Figs. 20 and 21. As here represented, the fixed rock arm 100 has a threaded block 103 swiveled in its outer end and through this threaded block extends a screw 104 which is provided with a knurled head 105 and has an intermediate smooth portion. This intermediate smooth portion extends through a swivel block 106, whose swivel pin 107 extends through the loosely journaled arm 101 and terminates in a screw-threaded portion which is provided with a knurled nut 108 adapted to clamp it firmly against said arm 101. By manipulating the knurled nut 108 of the screw, the angular position of the fixed arm 100 and of the loose rock arm 101 with respect to each other is changed, and consequently, the elevation of the wiping pad is changed, as may be desirable to suit dies of different thicknesses.

The cam 102 which operates the wiping pad is an ordinary disk or face cam. Throughout approximately one sixth of its circumference, the groove is a circular arc, whereby



the wiping pad is held in its lowermost position during the forward stroke of the die carrier. Instead of being fixed directly to the shaft, however, the cam disk is secured by a bolt 109 to a plate 110, which plate in turn is screwed rigidly on the end of the main worm shaft 23. The end plate is provided with an elongated arcuate slot 111 through which extends the bolt 109 which clamps the cam disk in place. By loosening this bolt, the cam disk may be adjusted at any suitable position, as may be desirable in order to regulate the timing of the movement of the wiping pad with respect to the other movements effected by the main screw shaft 23.

It is sometimes desirable to disconnect the die carrier mechanism from the driving shaft in order to facilitate the adjustment of the die plate. For this purpose, the driving shaft 23 has a flanged annular sleeve 112 keyed thereto on which fits the strap or annular member 113 on which is mounted the crank pin 45<sup>a</sup> to which the connecting rod 46<sup>a</sup> of the table actuating mechanism is pivotally fastened. The strap or annular member 113 has a radially projecting arm 114 thereon which serves as a lever or handle for manipulating it. In this handle is a longitudinal pocket opening inwardly. In this pocket slides a pin whose inner end is adapted to cooperate with a socket or hole 115 provided therefor in the periphery of the sleeve 112 which is fixed to the shaft. The outer portion of said pin is reduced in diameter and projects through a hole in the end of the handle, and is provided on its end with a knurled nut or finger piece 116 by which it may be manipulated. Inside of the pocket is a coiled spring 117 which bears at one end against a shoulder on the pin and at its outer end against the end of the pocket whereby said spring tends to force said pin inwardly. The outer portion of the pin has a small stud 118 thereon, and the opening in the end of the handle is slotted to permit the stud to pass through it. When the pin is withdrawn, and turned so that the stud is out of alinement with the slot, the pin is locked out of engagement with the sleeve, so that the shaft is free to turn without affecting the position of the sleeve. When the pin is turned, so that the stud thereon alines with the slot, the spring forces the pin against the periphery of the sleeve; and when the pin and socket are brought into alinement, the pin is forced into the socket, thereby locking the annular strap on to the sleeve so as to turn therewith. The annular strap is held against movement longitudinally of the sleeve by means of an annular plate 119 screwed to said sleeve, the plate being of slightly greater diameter than the sleeve.

The paper supply roll 120 is mounted upon a horizontal spindle or bar 121 provided therefor above the ink pan; and the

paper 122 for the wiping pad passes off of said supply roll around the forward end of the wiping pad, under said pad, thence over an idle roller 123 mounted on the framework, and thence under a suitable guide 124 to a winder roll 125 mounted upon a bracket 126 at the rear of the machine.

The paper winding mechanism is of the type illustrated in Letters Patent No. 862,108, and is adapted to intermittently take up all of the slack or looseness of the paper. For this purpose, the shaft of the winder roll has a pinion 128 thereon, which meshes with a rack 127 that is adapted to be actuated by a link 129 adjustably mounted on the crank arm 130 on the rock shaft 43 at the bottom of the machine. The pinion 128 is loosely mounted on the shaft or core 131 of the winder roll and is connected thereto by a friction clutch so regulated as to yield to the pull of the paper when the slack thereof is taken up.

In the construction illustrated in Figs. 27 to 31, the sleeve of the pinion 128 is widened at one end into an annular flange 132 upon whose face are mounted a series of gravity pawls 133 and limiting stops 134 therefor. Loosely journaled on said shaft or core of the winding roll in the plane of said gravity pawls is a ring 135 whose periphery is toothed to form a ratchet wheel adapted to cooperate with said gravity pawls. A similar toothed ring or ratchet wheel 136 is keyed to the core or shaft of the winding roll alongside of said first mentioned ratchet wheel. Above and in the plane of said fixed ratchet wheel are a plurality of gravity pawls 137 which are mounted on a plate 138 which is secured by pins or otherwise to the bracket 126 which supports the winding roll.

The tubular core or shaft 131 of the winding roll has peripheral slots 139 through which projects a plate 140 which bears against the side of the first mentioned ratchet wheel or clutch member 135 for the purpose of pressing it into frictional engagement with the fixed ratchet wheel. This plate or cross piece has a hole therein through which extends the reduced end of a rod 142 whose outer end rests in the bore of a hollow nut 143 which is threaded to work in the threaded end of the hollow core of the winding roll. In the bottom portion of the bore or pocket of said nut is a spring 144 which presses against the end of said rod. The projecting end of the nut is provided with a knurled head or handle 145 whereby it can be conveniently manipulated. By turning the nut, the pressure of the spring upon the rod is varied, and thereby the friction between the clutch members 135, 136 is varied.

On the core of the winding drum are mounted a plurality of cylindrical segments 146, which are connected to the core by means of parallel links 147. The outward



movement of the links is limited by a collar 148 provided on the core for the purpose. The segments are supported in their extended position by means of a flanged sleeve 149 whose inner portion is adapted to fit on the core of the winding roll and whose projecting end is formed into a handle 150 for convenient manipulation. Obviously, the withdrawal of this flanged sleeve or plug permits the segments to be collapsed and the waste paper to be withdrawn from the roll.

The operation of the winding mechanism is as follows: The reciprocating movement of the rack bar 127 causes a forward and backward movement of the pinion and of the pawls mounted on the flange thereof. The forward movement of these pawls causes a forward movement of the rotatable ratchet wheel 135 which constitutes the movable member of the friction clutch. On account of the frictional engagement of the clutch members, the rotation of the first member tends to rotate the second member of the clutch and consequently the core or shaft upon which it is fixed. The parts are so adjusted, however, that when the slack of the waste paper is taken up, the actuating member of the clutch continues its movement without transmitting movement to the second member thereof. The several pawls 137 provided for the driven member of the clutch are located to operate serially, that is to say, instead of being spaced apart some multiple of the distance between adjacent ratchet teeth, they are so positioned that no two of them are in operative engagement at the same time, and, consequently, one of them is in position to prevent the least unwinding of the roll.

In order to feed a constant and uniform amount of wiping paper, regardless of the size of the supply roll thereof, the friction strap 151 is arranged to bear against the periphery of the supply roll. One end of this strap is secured to and wound on a roller 152, which is provided with a spring 153 fixed to the framework and arranged to keep such strap taut. The other end of said strap is secured to and arranged to be wound on a roller 154, whose shaft 155 is provided with a pinion 156 fixed thereon. This pinion engages a rack 157 which extends through a pivotal guide 158 journaled concentric with said shaft and is connected with the rock arm or lever 159 which is pivoted on the side of the body casting. This lever, in turn, is connected by a connecting rod 159<sup>a</sup> to a portion of the crank arm 74 which is fixed on the rock shaft 43 at the base of the machine. Preferably, said crank arm 74 is slotted longitudinally and the rod 159<sup>a</sup> has an adjustable member 160 arranged to be set at any desired position in said slot and thereby regulate the stroke of the rack which receives its motion therefrom, and thereby regulate the

amount of paper delivered by the supply roll. As above described, the refuse wiping paper winding roller is provided with a pawl and ratchet arranged to prevent the unwinding of the paper therefrom; in consequence of which, when the rack 157 restores the strap winding roller 154 to its normal position, the spring on the other strap roller 152 rewinds said strap, which slides idle around the periphery of the feed supply roller without turning the same.

The construction of the table actuating mechanism illustrated in Figs. 32 and 34 is a modification of the table movement illustrated in the other figures. As illustrated in said Figs. 32 and 34, the rock arm 161 which actuates the die carrier has an elongated longitudinal slot 162 formed on the back thereof. In this slot slides a block 163 which is pivotally mounted on the end of a rock arm 164 whose shaft 165 is journaled in the framework at some distance above the shaft 43 of the rock lever 161. A second arm 166 on said rock shaft is pivotally connected to a link 46<sup>a</sup> which, in turn is connected to a crank 113 mounted on the main toggle-actuating shaft. The elongated slot at the back of said rock lever is straight for a portion of its length. The upper end of said slot, however, has a curvature whose radius is equal to the length of the rock arm 164 upon which the sliding block therein is mounted. Said slot is so designed that the sliding block 163 reaches the lower end of the curved portion of the slot some time before it reaches the upward limit of its movement, and the curved portion of the slot is designed with the axis of the rock shaft as its center when the rock lever is in the position corresponding to the forward limit of its stroke. By this arrangement, the oscillatory movement of the rock lever 161 ceases while the sliding block reciprocates in the curved portion of the slot; that is to say, the die carrier remains stationary in its foremost position for an appreciable portion of time corresponding to the "dwell" of the plunger.

At the front of the machine is mounted a work-table 169. It is preferable to adjustably and detachably mount this table on a swing arm 170 which is arranged to extend across the front end of the main frame 1. This arm 170 has an angular extension 171 which is provided with a vertical bore adapted to register with alining holes in lugs 172 on the side of said frame 1. The portion of the arm 170 which extends across the front of the frame is preferably dovetailed or beveled to receive counterpart notched portions of brackets 173 to which the table is secured. Preferably, these brackets are connected by tie rods or connecting members 174 and the ends of said brackets are slit at 175 and provided with tightening screws 176 whereby the brackets may be adjustably secured on



said swing arm 170. The free end of the swing arm is bifurcated or may be otherwise suitably arranged for the engagement of a locking member 177.

5 To permit the table 169 to be readily swung aside, a cam lever 167 is mounted on the side of the frame 1 so as to bear against the lower end of the pintle 168 of the swing arm 170. By manipulating said cam lever  
10 the table may be lifted so that its rearward side extensions 169<sup>a</sup> will clear the sides of the frame at the throat. So, too, by raising the table and inserting shims or washers between the hub of the extension 171 and the lower  
15 lug 172, the table may be adjusted to the height of dies of various thicknesses.

The design of the main frame and the open throat thereof permits the use of a work-table of larger area. Therefore, it is preferable  
20 to extend the sides of the work table 169 rearwardly for a considerable distance; and by mounting the table upon a swing arm the same may readily be moved away from the front of the machine when so desired.

25 Among the more important advantages of the present machine are the compactness and rigidity of its frame, whereby it can be made of small size and with comparatively little material. The rigidity of its frame and the  
30 character of the working parts make the machine very smooth-running, so that it is adapted for use on floors where ordinary embossing and printing presses are not permissible. The fact that the frame is open  
35 entirely around the plunger makes it practicable to emboss sheets of much larger size than have heretofore been embossed.

What I claim is:

1. In an embossing and printing press, a  
40 frame, a plunger reciprocatably mounted therein, a toggle bar, a shaft arranged to actuate said bar, a toggle link mounted on the upper end of said bar and connected to a stationary abutment, and a second toggle  
45 link mounted on the lower end portion of said bar at a greater distance from the shaft than said first mentioned link and connected to said plunger to reciprocate the same and to maintain a continued pressure thereon in  
50 its lowermost position.

2. In an embossing and printing press, a frame, a plunger reciprocatably mounted therein, a shaft having an eccentric portion, a toggle bar pivotally connected to said ec-  
55 centric portion, and toggle links mounted on said bar at unequal distances from the actuating shaft and connected, respectively, to said plunger and to a stationary abutment.

3. In an embossing and printing press, a  
60 frame, a plunger reciprocatably mounted therein, a toggle bar and means for actuating said bar, an upper link mounted on said bar and bearing against a stationary abutment, and a second link mounted on said bar  
65 at a distance below and beyond said first

mentioned link approximately equal to the length of said link, and connected to said plunger.

4. In an embossing and printing press, a frame, a plunger reciprocatably mounted  
70 therein, a shaft having two cranks thereon, a driving gear mounted on said shaft between said cranks, a bifurcated toggle bar whose arms are journaled on said cranks, toggle links mounted on said bar and con-  
75 nected, respectively, to said plunger and to a stationary abutment.

5. In an embossing and printing press, a frame, a plunger reciprocatably mounted therein, a shaft having two cranks thereon, a worm gear fixed on said shaft between said  
80 cranks, a worm shaft cooperating with said worm gear, a bifurcated toggle bar whose arms are journaled on said cranks, and toggle links mounted on said bar and connected,   
85 respectively, to said plunger and an abutment.

6. In an embossing and printing press, a frame, a plunger reciprocatably mounted therein, a vertically adjustable abutment  
90 piece mounted in said frame above said plunger, a shaft having an eccentric member thereon, a toggle bar swiveled on said eccentric member to be actuated thereby, and toggle links mounted on said bar and con-  
95 nected, respectively, to said plunger and to said abutment piece.

7. In an embossing and printing press, a frame, a plunger reciprocatably mounted therein, a vertically adjustable abutment  
100 piece mounted in said frame above said plunger, a shaft having an eccentric member thereon, a toggle bar swiveled on said eccentric member to be actuated thereby, and toggle links mounted on said bar and con-  
105 nected, respectively, to said plunger and to said abutment piece, and means for adjusting said abutment piece, said means comprising a horizontally movable wedge block lo-  
110 cated between the stationary part of the frame and the upper surface of said abutment piece, the meeting surfaces of the wedge block and of the adjustment piece being inclined and forming counterparts of each  
115 other.

8. An embossing and printing press comprising an integral hollow body portion having a lower member and an upper member spaced therefrom but connected thereto at the rear and about midway of the sides  
120 thereof, the lower member having four side and end walls and the upper member having two side walls and braces therefor at the ends.

9. An embossing and printing press com-  
125 prising an integral body casting having a lower member and an upper member spaced therefrom but connected thereto at the rear and about midway of the sides thereof the lower member consisting of four side and  
130



end walls and the upper member consisting of two side walls and braces therefor at the ends and top thereof.

10. An embossing and printing press comprising an integral body portion having a lower member and an upper member spaced therefrom but connected at the rear and about midway of the sides thereof, a vertical reciprocable plunger mounted in the front end of the upper member and an anvil for the die carrier mounted in alinement therewith in the lower member the lower member consisting of four side and end walls and the upper member consisting of two side walls and braces therefor at the ends and top thereof.

11. An embossing and printing press comprising a hollow integral body casting having a lower member and an upper member spaced therefrom but connected thereto at the rear and midway of the sides thereof, and having cross members near its top arranged to constitute bearings for a longitudinal shaft, a shaft mounted in said bearings, a second shaft mounted transversely in bearings in the upper member above the supporting portions and operatively connected to said first mentioned shaft, a vertically reciprocable plunger mounted in the front end of the upper member and operatively connected to said transverse shaft to be actuated thereby, an anvil in the front end of the lower member, and a reciprocating die carrier arranged to be brought into operative relation to said plunger.

12. An embossing and printing press comprising a hollow integral body casting having a lower member and an upper member spaced therefrom but connected thereto at the rear and midway of the sides thereof, and having cross members near its top arranged to constitute bearings for a longitudinal shaft, a worm shaft mounted in said bearings, a second shaft mounted transversely in bearings in the upper member above the connecting portions and having a worm gear meshing with said worm shaft, a vertically reciprocable plunger mounted in the front end of the upper member and operatively connected to said transverse shaft to be actuated thereby, an anvil in the front end of the lower member, and a reciprocating die carrier arranged to be brought into operative relation to said plunger.

13. An embossing and printing press comprising a hollow integral body casting having a lower member and an upper member spaced therefrom but connected thereto at the rear and midway of the sides thereof, and having cross members near its top arranged to constitute bearings for a longitudinal shaft, a longitudinal shaft mounted in said bearings, a hollow worm sleeved on said shaft, a clutch adapted to secure said worm to said shaft, means for actuating said clutch,

a second shaft mounted transversely in bearings in the upper member above the connecting portions and having a worm gear meshing with said worm shaft, a vertically reciprocable plunger mounted in the front end of the upper member and operatively connected to said transverse shaft to be actuated thereby, an anvil in the front end of the lower member, and a reciprocating die carrier arranged to be brought into operative relation to said plunger.

14. In an embossing and printing press, a reciprocable die carrier, a rock arm operatively connected thereto and having an elongated slot extending longitudinally thereof and curved at the end, an oscillating arm having a member arranged to slide in said slot and reciprocable means for oscillating said arm, the curved portion of said slot being an arc whose center is the axis of said oscillating arm, all arranged so that the die carrier will dwell at the forward limit of its stroke.

15. In an embossing and printing press, a frame, a die carrier reciprocatingly mounted in said frame, a rock arm operatively connected to said die carrier and having an elongated slot extending longitudinally thereof and curved at its end, a bell crank lever having on one of its arms a block slidably fitting in said slot, a driving shaft operatively connected to said bell crank lever to actuate the same, the curved portion of said slot being an arc whose center is the axis of the bell crank lever, all arranged so that said die carrier will dwell at the forward end of its stroke.

16. In an embossing and printing press, a frame, a die carrier reciprocatingly mounted in said frame, a rock arm operatively connected to said die carrier and having an elongated slot extending longitudinally thereof and curved at its end, a bell-crank lever having on one of its arms a block slidably fitting in said slot, a driving shaft having a crank thereon and a rod connecting said crank to the other end of said bell-crank lever, the curved portion of said slot being an arc whose center is the axis of the bell-crank lever, all arranged so that said die carrier will dwell at the forward end of its stroke.

17. In an embossing and printing press, a driving shaft, a reciprocable die carrier, and intermediate connecting devices for transmitting motion from said shaft to said die carrier, said devices comprising a sleeve on said shaft and a crank pin on said sleeve, and means for engaging and disengaging said sleeve from said shaft.

18. In an embossing and printing press, a driving shaft, a reciprocable die carrier, an intermediate connecting devices for transmitting motion from said shaft to said die carrier, said devices comprising a sleeve on said shaft and a crank pin on said sleeve, and



means for engaging and disengaging said sleeve from said shaft, said means comprising a peripheral socket on a member movable with the shaft and a radially movable pin  
5 mounted on said sleeve in position to engage said socket.

19. In an embossing and printing press, a driving shaft, a reciprocable die carrier, and intermediate connecting devices for  
10 transmitting motion from said shaft to said die carrier, said devices comprising a sleeve on said shaft and a crank pin on said sleeve, and means for engaging and disengaging said sleeve from said shaft, said means comprising  
15 a sleeve having a crank pin and a hollow radial portion constituting a handle, a spring actuated pin slidably mounted in the hollow of said handle and arranged to interlock with a socket provided therefor on the shaft.

20. In an embossing and printing press, a driving shaft, a reciprocable die carrier, and intermediate connecting devices for  
20 transmitting motion from said shaft to said die carrier, said devices comprising a sleeve on said shaft and a crank upon said sleeve, and means for engaging and disengaging said sleeve from said shaft, said means comprising  
25 a sleeve mounted on the shaft and having a crank pin and a hollow radial portion constituting a handle, a pin slidably and rotatably mounted in the hollow of said handle and  
30 arranged to interlock with the socket on the shaft, the end of said pin projecting through a hole in the end of the handle and having a locking stud arranged to pass through a slot  
35 in said end.

21. In an embossing and printing press, a frame, a wiping pad having an inclined upper surface, a wedge block intervening between  
40 said inclined surface and a portion of the frame, and means for reciprocating said wedge block horizontally.

22. In an embossing and printing press, a frame, a wiping pad having inclined upper  
45 surfaces, wedge blocks intervening between said inclined surfaces and a portion of the frame, means for reciprocating said wedge blocks horizontally, and means for raising said wiping pad.

23. In an embossing and printing press, a frame, a spring supported wiping pad having  
50 its upper surfaces inclined, wedge blocks intervening between said inclined surfaces and a portion of the frame, and means for intermittently reciprocating said wedge blocks  
55 horizontally, said means comprising a rock shaft and adjustable links connecting the respective wedge blocks to the arms of said shaft.

24. In an embossing and printing press, a frame, a spring supported wiping pad having  
60 its upper surface inclined, wedge blocks intervening between said inclined surfaces and a portion of the frame, and means for intermittently reciprocating said wedge blocks  
65

horizontally, said means comprising a driving shaft, a dwell cam thereon, a rock shaft having an arm in operative engagement with  
said cam, and adjustable links connected to said wedge blocks and operatively connected  
70 to said rock shaft.

25. In an embossing and printing press, a frame, a spring supported wiping pad having  
its upper surfaces inclined, wedge blocks intervening between said inclined surfaces and  
75 a portion of the frame, and means for intermittently reciprocating said wedge blocks horizontally, said means comprising a rock shaft operatively connected to said wedge  
blocks and having a swivel block in one arm  
80 thereof, a driving shaft having a dwell cam thereon, a lever arm loosely mounted on said rock shaft and operatively connected to said cam, and adjustable means for fastening  
said lever arm to said swivel block.  
85

26. In an embossing and printing press, a frame, a spring supported wiping pad having  
its upper surfaces inclined, wedge blocks intervening between said inclined surfaces and  
90 a portion of the frame, and means for intermittently reciprocating said wedge blocks horizontally, said means comprising a driving shaft, a dwell cam rotatably adjustable  
thereon, a rock shaft operatively connected to said wedge blocks and having an arm  
95 operatively connected to said cam.

27. A wiping pad comprising a frame, a ribbed member on the upper side thereof, a counterpart grooved member, means for  
clamping said members together, a roller on  
100 the upper side of said frame having a longitudinal peripheral groove, a locking bar in said groove and projecting beyond the periphery of said roller, and means for turning  
said roller, said means comprising a screw  
105 gear on said roller and a screw on the frame in engagement therewith.

28. An embossing and printing press, a frame, a driving shaft mounted therein, an  
ink pan slidably mounted in said frame, an  
110 inking roll located in said ink pan and having a worm gear on the projecting end thereof, and a worm mounted on the frame in position to engage said worm gear in all positions  
at which it may be adjusted, said worm being  
115 permanently operatively connected to said driving shaft.

29. An embossing and printing press, a frame, a driving shaft mounted therein, a  
die carrier, and means for inking said die  
120 carrier, said means comprising an ink pan slidably mounted in said frame, an inking roll located in said ink pan and having a worm gear on the projecting end thereof, and a worm mounted on the frame in position  
125 to engage said worm gear in all positions at which it may be adjusted, said worm being permanently operatively connected to said driving shaft.

30. An embossing and printing press com- 130



prising a body-frame having an open throat at the impression point of said press, and a work table hingedly mounted at the front of said press adjacent to said open throat and  
5 having side extensions which extend rearwardly at each side of said body frame.

31. An embossing and printing press comprising a hollow body portion having a lower member and an upper member spaced there-  
10 from but connected thereto at the rear and about midway of the sides thereof, a vertically reciprocable plunger mounted in the front end of the upper member, a horizon-  
tally reciprocatory die carrier arranged to  
15 carry dies of various thicknesses beneath said plunger, and a work table that is vertically adjustable whereby the surface of the table may be adjusted substantially flush with  
dies of any thickness.

32. An embossing and printing press comprising a body portion having a lower mem-

ber and an upper member spaced therefrom but connected thereto at the rear about mid-  
way of the sides thereof and having an  
open throat at the front thereof, a vertically  
25 reciprocable plunger mounted in the front end of the upper member, a horizontally reciprocatory die carrier arranged to carry  
dies of various thicknesses, a pivotally  
mounted work table surrounding said open  
throat and means for adjusting said work  
30 table vertically to cooperate with dies of different thicknesses.

In witness whereof I have signed my name to this specification in the presence of two  
35 subscribing witnesses, this 27th day of March, 1908, at St. Louis, Missouri.

CHARLES E. BROOKS.

Witnesses:

JAMES A. CARR,  
J. B. MEGOWN.