

No. 789,870.

PATENTED MAY 16, 1905.

T. M. NORTH.
SIDE LAY.

APPLICATION FILED NOV. 28, 1904.

3 SHEETS—SHEET 1.

Fig. 2.

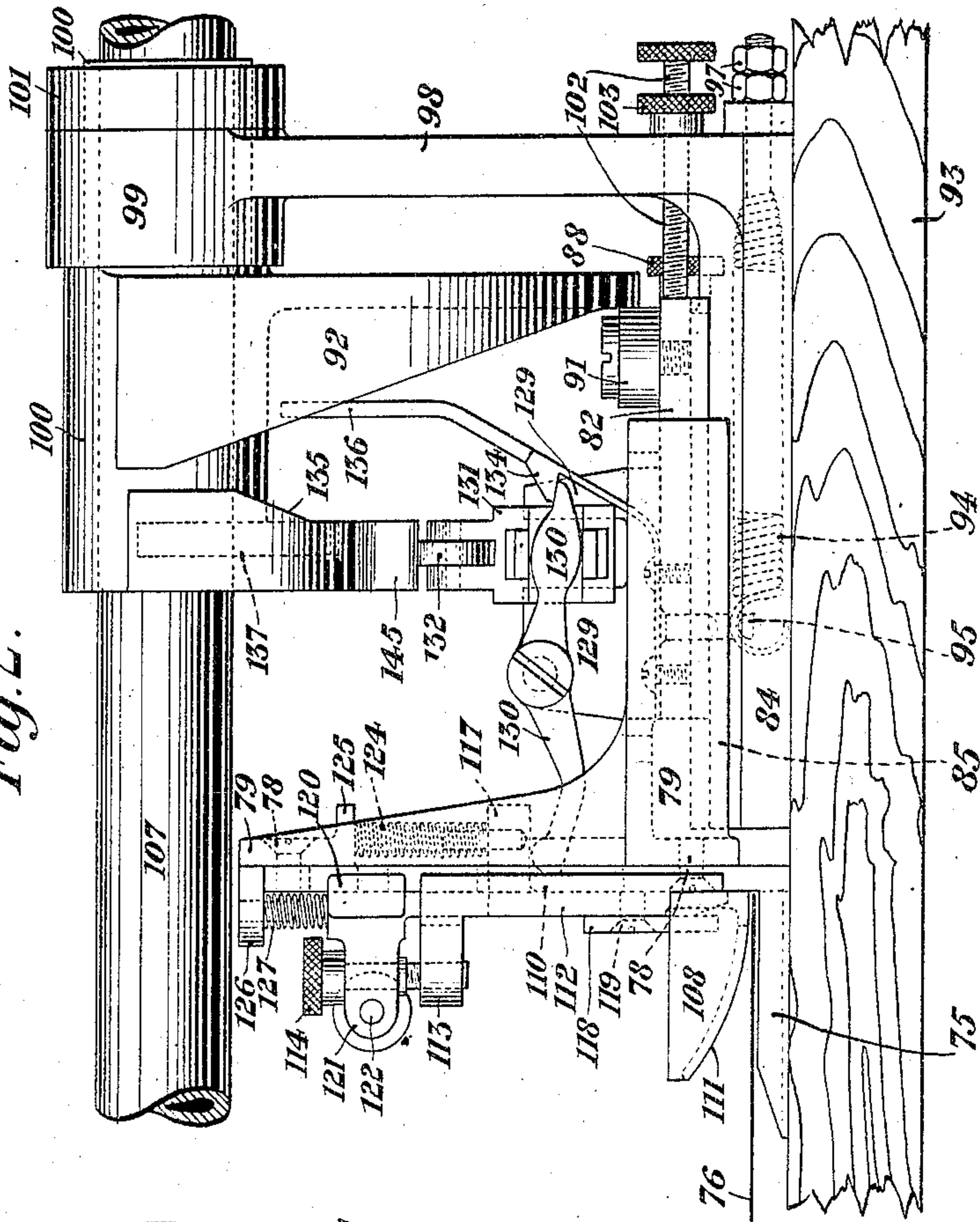
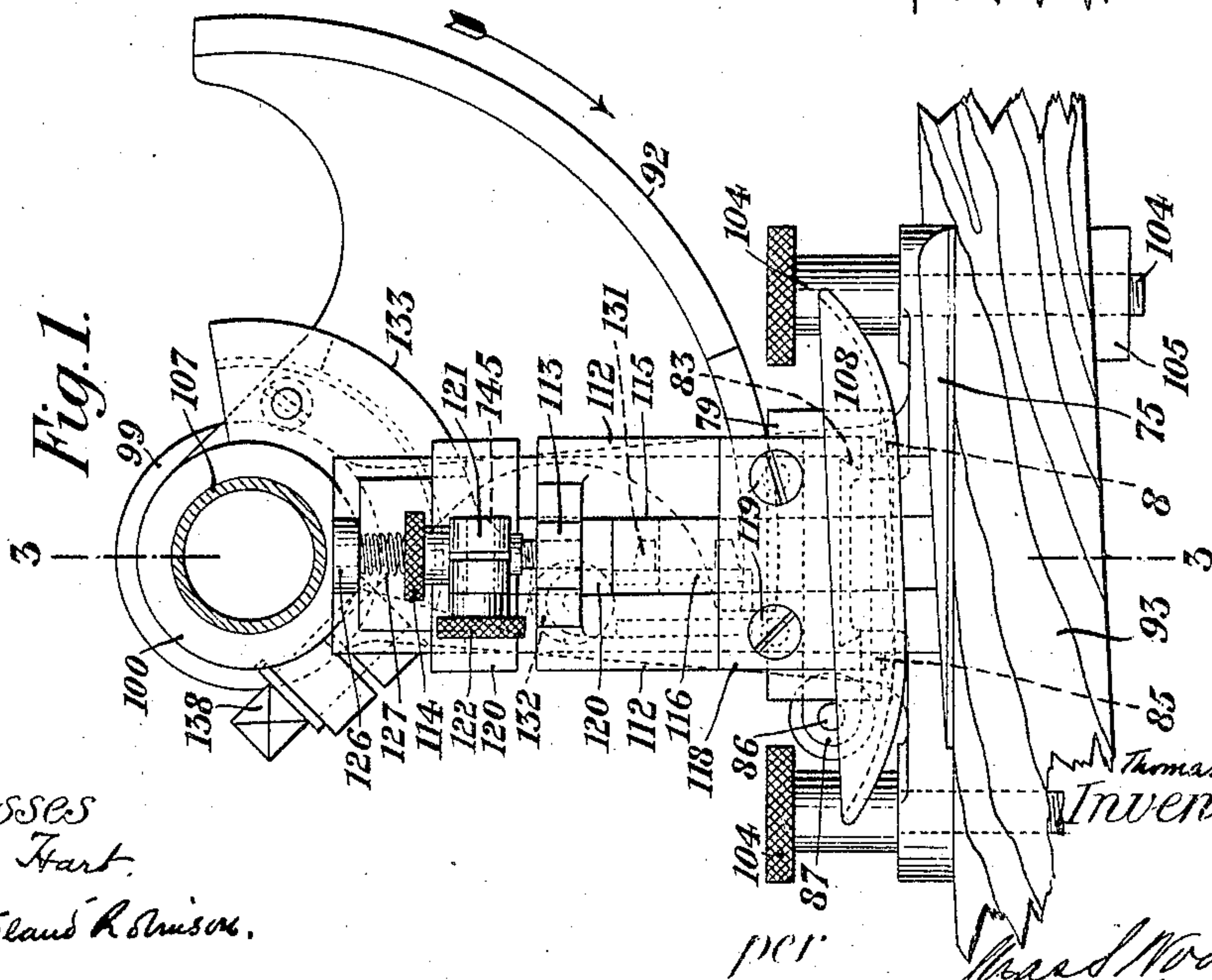


Fig. 1.



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3 SHEETS—SHEET 2.

Fig.3.

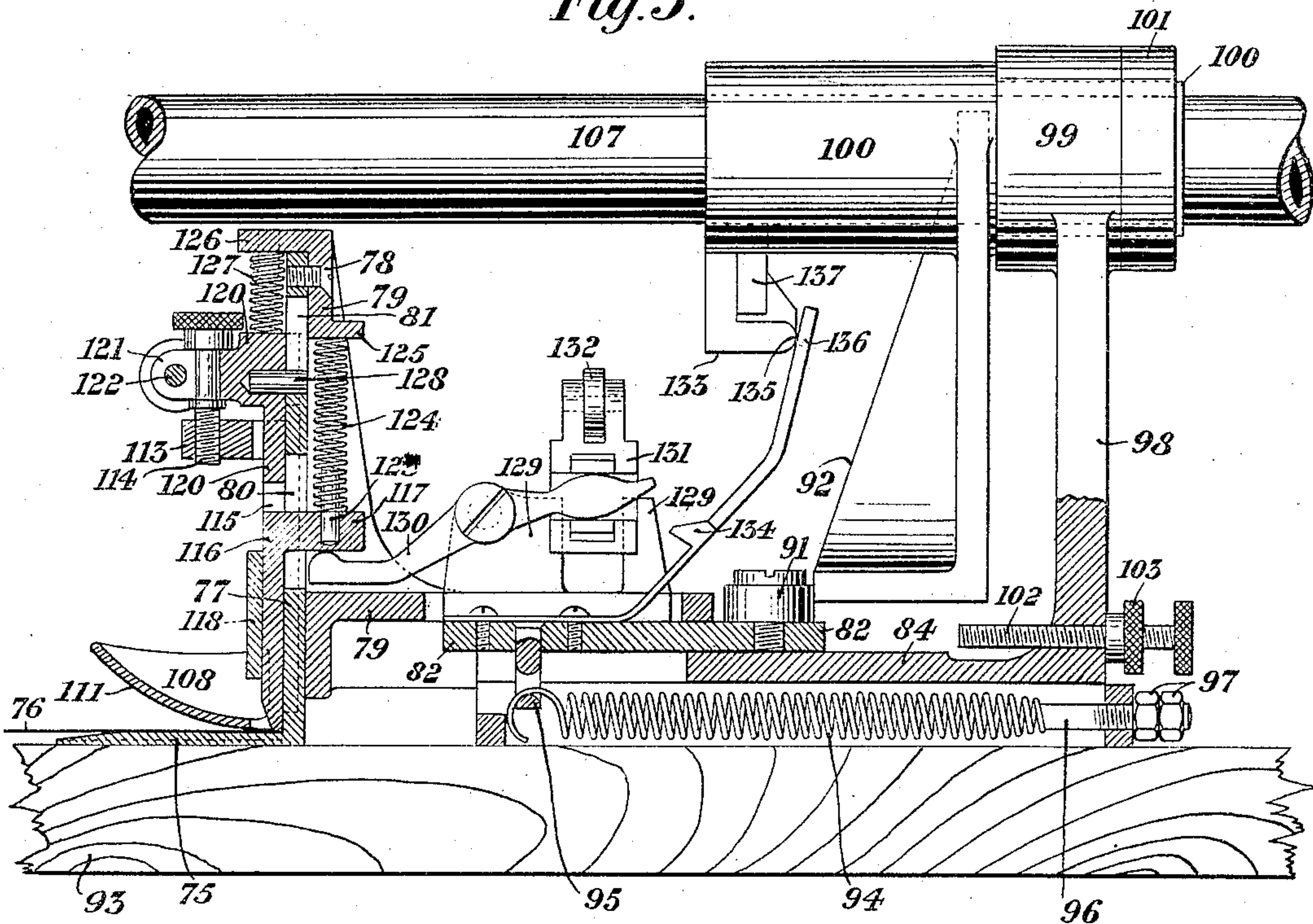
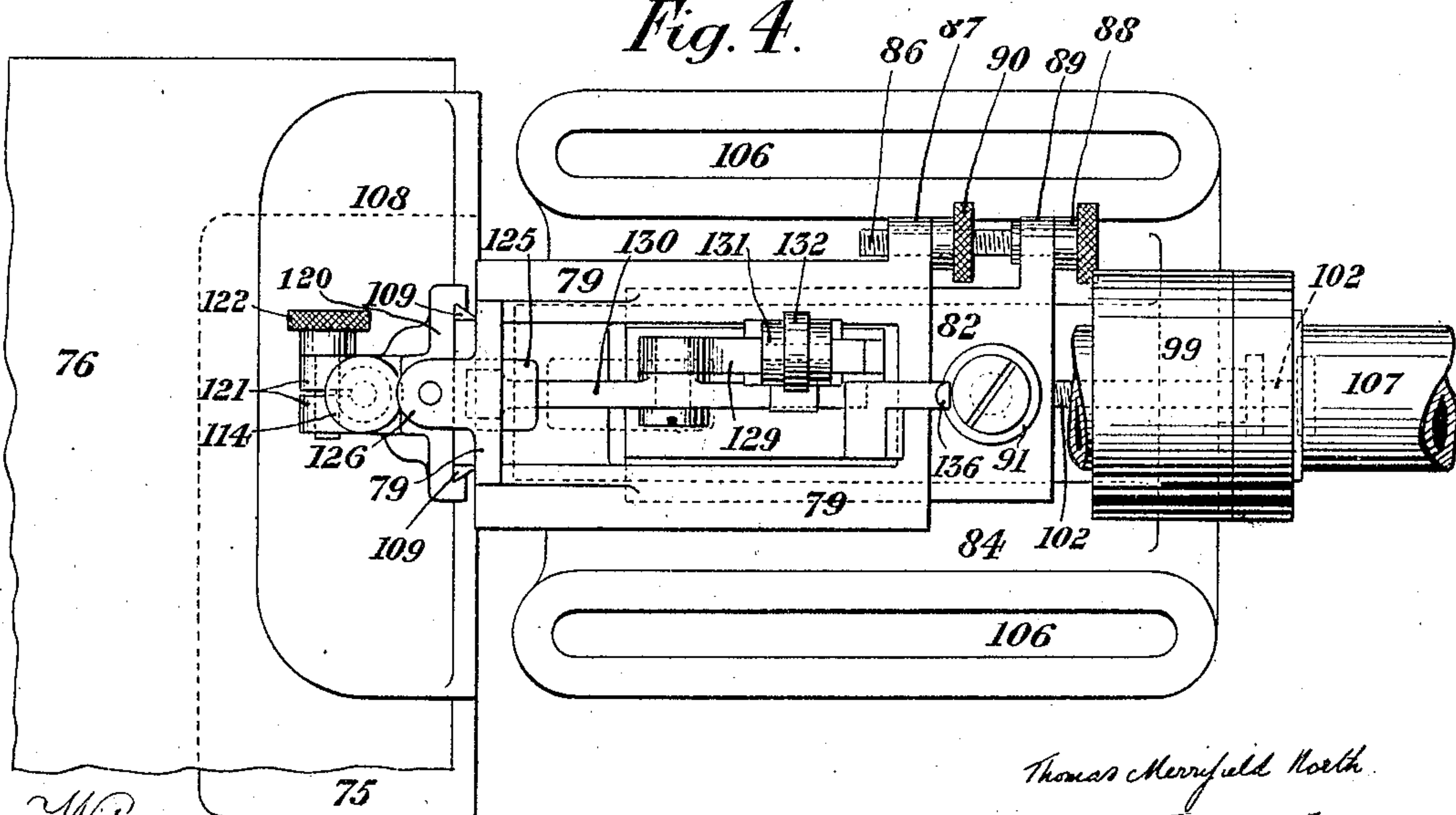


Fig. 4.



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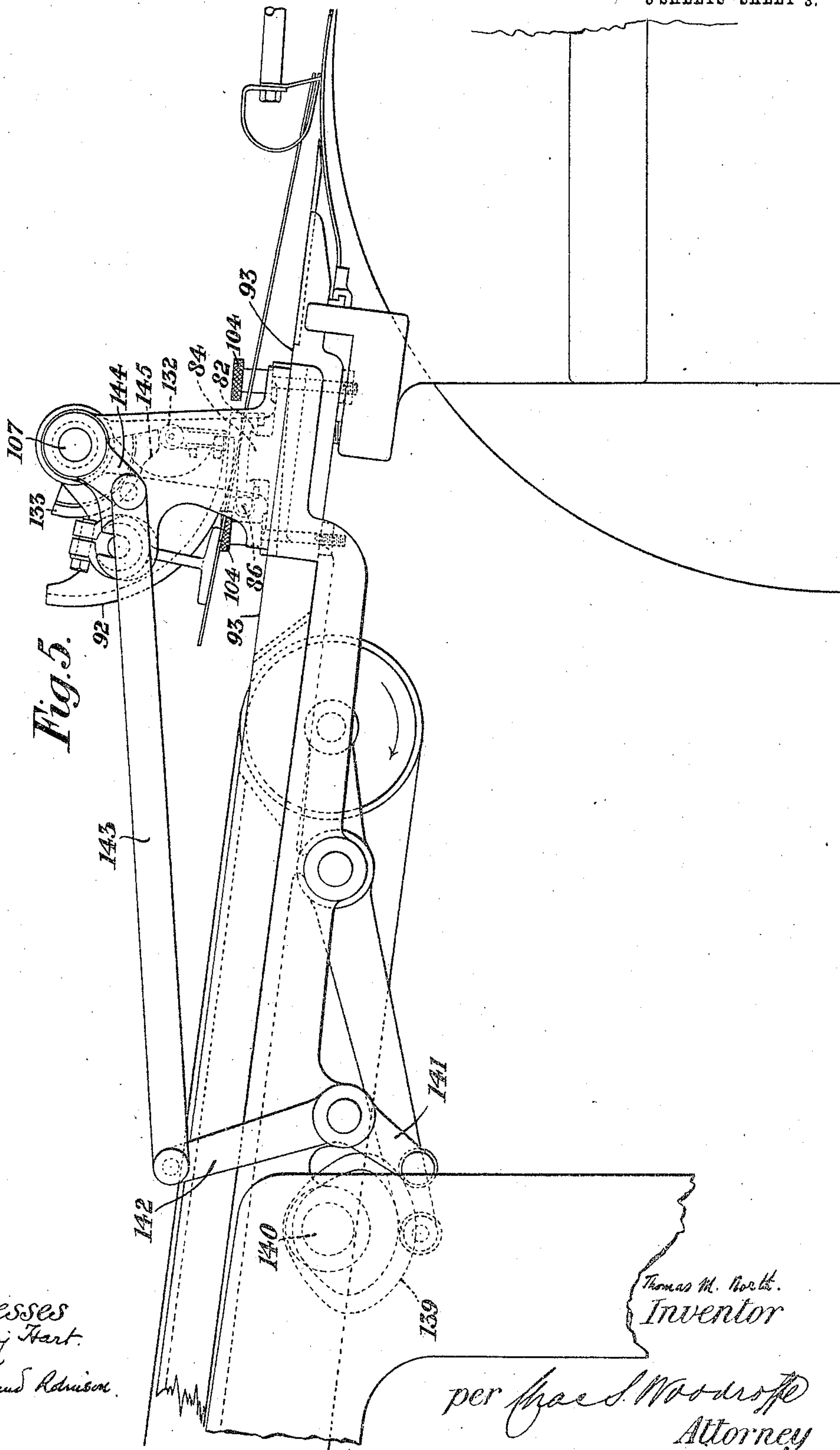
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

THOMAS M. NORTH, OF LONDON, ENGLAND, ASSIGNOR TO LINOTYPE AND MACHINERY LIMITED, OF LONDON, ENGLAND.

SIDE-LAY.

SPECIFICATION forming part of Letters Patent No. 789,870, dated May 16, 1905.

Application filed November 28, 1904. Serial No. 234,556.

To all whom it may concern:

Be it known that I, THOMAS MERRIFIELD NORTH, of Nos. 188 and 189 Fleet street, in the city of London, England, have invented new and useful Improvements in Side-Lays; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to side-lay apparatus of printing-machines, and has for its object to provide an improved construction of such apparatus and one which shall render them capable of very delicate and accurate adjustment and reliable in operation.

The invention appertains to the well-known type of side-lay apparatus which effects lateral registration of each sheet by pushing it across the feed-board up to a certain position and then seizing it and retracting it to the proper feeding position.

In the accompanying drawings, which are to be taken as a part of this specification and read therewith, Figure 1 is a side elevation, and Fig. 2 a front elevation, of the improved apparatus constructed according to the present invention. Fig. 3 is a view, partly in front elevation and partly in vertical section, on line 3 3 of Fig. 1, showing the apparatus in a position different from that in which it is represented in Figs. 1 and 2. Fig. 4 is a plan of the apparatus partly broken away; and Fig. 5 is a side elevation of part of a printing-machine, showing the means for operating the improved side-lay apparatus.

According to this invention there is provided the usual foot 75, to pass under and push the sheet 76, as shown in Figs. 2, 3, and 4. The upper surface of this foot 75 is preferably beveled in a direction parallel with the sides of the feed-board, as indicated in Fig. 1. The foot 75 is formed integral with a vertical member 77, by which it is secured, as by the screws 78, Figs. 2 and 3, to a bracket 79, and is provided with two apertures 80 81, hereinafter more particularly referred to. The bracket 79 is adjustable in a horizontal direction transverse to the machine, on a

plate 82, which is slidable on a dovetail guide 83, (shown in dotted lines in Fig. 1,) formed in part with the base 84 of the side-lay. The bracket 79 is held to the plate 82 either by its own inturned edges 85, as shown in dotted lines in Figs. 1 and 2, or otherwise, these means leaving it free to move on the plate 82 only in the above-named horizontal direction. This movement is imparted to the bracket 79 by means of an adjusting-screw 86, whose thread engages with a lug 87 on the said bracket, and whose head 88 is journaled in a lug 89 on the plate 82, as shown clearly in Fig. 4, a lock-nut 90 being provided on the screw 86 for retaining the parts 79 and 82 in their respective positions of adjustment. The plate 82 is provided with an anti-friction-roller 91, with which a segmental edge cam 92 coöperates to move the said plate 82 and its attachments inward toward the center of the feed-board 93, the return or outward movement of the plate 82 being effected by a coiled spring 94, attached at one end to an eye 95, depending from the plate 82, and at the other end to a screwed rod 96, passing through the outer end of the base 84, as shown best in Fig. 3, the outer end of said rod 96 having nuts 97 on it to adjust the tension or effective strength of the spring 94 and to retain the said spring at such adjusted tension.

The base 84 is integral with a standard 98, having at its upper end a bearing 99, in which the hollow boss 100 of the above-named segmental cam 92 oscillates, and on this boss is secured a collar 101, which prevents the cam 92 having any but an oscillating motion independently of the standard 98. At the lower part of the standard 98 is provided an adjustable set-screw 102, having a lock-nut 103 on it and situated in the outward path of the plate 82 for limiting its outward movement to any desired extent. The base 84 is secured to the feed-board 93 by bolts 104 and nuts 105, the bolts passing through slots 106, Fig. 4, in the base 84, so as to allow (when the said bolts are loosened) the complete side-lay device to be adjusted laterally of the feed-board to suit varying widths or positions of

the sheets fed into the machine. To admit of this lateral adjustment being effected without disturbing the operative connection between the cam 92 and its operating-shaft 107, the boss 100 of the said cam is connected to the shaft 107 by a suitable feather-and-groove device, which latter is not shown in the drawings.

On the before-described vertical member 77 a sheet guide or guard 108 is vertically slidable, these two parts 77 and 108 for this purpose being held together by a dovetail connection consisting of a dovetail guide 109, Fig. 4, on the member 77, and two dovetail ribs 110 on the sheet-guide, one of which ribs is shown in dotted lines in Fig. 2. The sheet-guard comprises a foot, which itself is designated by the number 108, and which has a convex sole 111 and is inclined in the same direction as the upper surface of the foot 75, this upper surface and the central portion of the under surface of the guard 108 preferably being parallel, or practically so, as shown in Fig. 1. The sheet-guide also comprises two parallel vertical members 112, Fig. 1, integral with the guard 108, and whose upper ends are united through a forwardly-projecting bridge-piece or lug 113, into which is threaded the lower end of an adjusting-screw 114. The two before-mentioned dovetail ribs 110 are formed one at the back of each of the two vertical members 112. The space 115 between the two members 112 constitutes a vertical guide for a plunger 116, provided with a rearwardly-projecting lug 117 and retained in the said guide 115 by a keeper-plate 118, secured, as by screws 119, to the face of the two members 112. It also serves to accommodate the lower part of a slide 120, whose upper part is guided and free to move vertically on the upper part of the before-mentioned dovetail guide 109. The slide 120 is provided with a forwardly-projecting split bearing 121, within which is journaled the before-described screw 114, and with a clamping-screw 122, by means of which the adjusting-screw 114 can when required be clamped against rotation. The slide 120 forms virtually an adjustable part of the sheet-guide 108, the said two parts being included in the term "two-part guard" hereinafter used.

The rearwardly-projecting lug 117 passes through the before-mentioned aperture 80 in the member 77, and it is capable of moving freely in a vertical direction in such aperture. The lug 117 is provided with a stud 123, encircled by the lower end of a helical spring 124, whose upper end bears against the under side of a lug 125, formed upon the before-described bracket 79. The bracket 79 is also provided with a forwardly-projecting lug 126, between which and the slide 120 is retained a compression-spring 127, which always tends to depress the said slide. The

slide 120 is provided with a stop-pin 128, free to move up and down in the before-described aperture 81, said stop-pin by abutting against the lower end of the aperture, as indicated in Fig. 3, serving to limit the downward movement of the slide 120 and sheet-guide 108.

On the plate 82 are provided two vertical guides 129, to one of which is pivoted a lever 130 and between which is vertically movable a slide 131 in constant working engagement with one end of the said lever, the opposite end of this lever being in constant working engagement with the under side of the lug 117. At its upper end the slide 131 is provided with an antifriction-roller 132, adapted to be operated upon by and moved into and out of the operative path of a cam 133, mounted upon the before-mentioned boss 100. The cam 133 has two portions having different lengths of radius, and when the portion having the longer radius acts on the roller 132, as shown in Figs. 1 and 2, the lever 130 is operated so as to raise the plunger 116. When the parts are in their last-named respective positions, a spring-detent 134 engages with the lever 130, so as to retain it and the devices in operative connection therewith in the said positions, the release from these positions being effected by an edge cam 135 acting on a tail 136 of the detent 134 to disengage the latter from the lever 130. The cams 133 and 135 are preferably formed as integral portions of the same casting, this casting being of L-shaped section, as shown in Fig. 3, and screwed or otherwise conveniently secured to a sector-shaped blade 137, integral with the before-described boss 100. This boss, as shown in Fig. 1, is split and provided with a clamping-screw 138, so that after the side-lay apparatus has been adjusted laterally of the machine to the required position by tightening the said screw the apparatus may be retained in such adjusted position.

As represented in Fig. 5, the before-mentioned shaft 107 may be oscillated by means of a cam 139, fast on a rotating shaft 140, the motion being transmitted from the said cam through lever-arms 141 142, a link 143, and a lever-arm 144, the last named fast upon the shaft 107. The devices shown in Fig. 5, other than those hereinbefore described, may be of any ordinary construction.

The operation of the before-described apparatus is as follows: The lever 130 being engaged with the detent 134 and the apparatus being otherwise in the normal position, in which it is represented in Figs. 1 and 2, the sheet 76 is fed between the two feet 108, immediately after which the shaft 107 commences its oscillation in the direction indicated by the arrow in Fig. 1, so that through the cam 92 and horizontally-sliding bracket 79 the said sheet is pushed inward

from the edge of the feed-board 93. During this inward movement of the bracket 79 the detent-tail 136 is brought into the path of the oscillating cam 135, which by its further
 5 oscillation immediately thereafter releases the detent 134 from the lever 130, as shown in Fig. 3. The spring 124 is thus allowed to depress the plunger 116, and the guard 108, then supported by the said plunger through
 10 the slide 120, also descends under the action of its spring 127 until the stop-pin 128 engages the lower end of the aperture 81. By these means the guard 108 reaches the sheet 76 before the plunger does so, and thereby it
 15 serves to prevent the sheet jumping up and to depress any upturned part or crease or bulge which may exist in the sheet preparatory to the immediately-succeeding engagement of the plunger 116 with the sheet. At
 20 this stage of the operation the sheet 76 is securely gripped between the plunger 116 and the foot 75 and occupies its most inward position—that is to say, farthest from the edge of the feed-board 93. The shaft 107 then
 25 commences its oscillation in the direction opposite to that indicated by the arrow in Fig. 1, with the result that the pressure of the cam 92 on the roller 91 is gradually withdrawn and the spring 94 thereby allowed to
 30 retract the bracket 79, this latter simultaneously withdrawing the sheet then gripped between the plunger 116 and the foot 75. This outward movement of the bracket 79, conjointly with the continuance of the oscillation of the shaft 107, also places the detent-tail 136 out of contact with the cam 135, and
 35 thereby allows the detent 134 to assume the position proper for effecting the engagement of the lever 130 when the latter is next operated by its cam 133. By the same outward
 40 movement of the bracket 79 the roller 132 is brought into the operative path of the cam 133, so that by the continued oscillation of the said cam the incline 145 of the latter depresses the slide 131 and through the lever
 45 130 raises first the plunger 116 and then the guard 108, the latter being raised when the plunger 116 comes into contact with the slide 120. This retention of the guard 108 down
 50 upon the sheet 76 after the plunger 116 has been raised serves to detach any sheet 76 which may accidentally adhere to the said plunger. At the termination of the last-mentioned movement of the lever 130 the
 55 detent 134 engages with it and will thereafter retain it in its normal position until the slide 79 is next moved inward.

The before-described screw 114 admits of the guard 108 being adjusted to suit different
 60 thicknesses of paper which the apparatus may be required to deal with, the proper adjustment being that in which the said guard when depressed is close to or only lightly in contact with the surface of the said paper.
 65 The screw 86 serves to correct any inaccu-

racy in or supplement the rough or approximate adjustment given to the side-lay apparatus by moving it on the before-mentioned bolts 104.

I claim—

1. In a side-lay the combination of a member adapted to reciprocate horizontally and laterally of the feed-board, a foot secured to the said member and adapted to underlie the paper on the feed-board, a plunger vertically
 70 reciprocal upon the horizontally-reciprocal member and adapted to grip the paper between itself and the foot, and a guard also vertically reciprocal upon the horizontally-reciprocal member, and adapted to reach the
 75 paper before, and leave it after, the plunger respectively reaches and leaves it. 80

2. In a side-lay the combination of a member adapted to reciprocate horizontally and laterally of the feed-board, a foot secured to
 85 the said member and adapted to underlie the paper on the feed-board, a plunger vertically reciprocal upon the horizontally-reciprocal member and adapted to grip the paper between itself and the foot, a guard also verti- 90
 cally reciprocal upon the horizontally-reciprocal member, and adapted to approach and recede from the paper, and springs operatively connected with the plunger and guard for causing them to approach the paper. 95

3. In a side-lay the combination of a member adapted to reciprocate horizontally and laterally of the feed-board, a foot secured to the said member and adapted to underlie the
 100 paper on the feed-board, a plunger vertically reciprocal upon the horizontally-reciprocal member and adapted to grip the paper between itself and the foot, a guard also vertically reciprocal upon the horizontally-recip- 105
 rocal member, and adapted to approach and recede from the paper, and a cam in operative connection with the plunger and guard for causing them to recede from the paper.

4. In a side-lay the combination of a member adapted to reciprocate horizontally and
 110 laterally of the feed-board, a foot secured to the said member and adapted to underlie the paper on the feed-board, a plunger vertically reciprocal upon the horizontally-reciprocal member and adapted to grip the paper be- 115
 tween itself and the foot, a guard also vertically reciprocal upon the horizontally-reciprocal member and adapted to approach and recede from the paper, and springs and a cam operatively connected with the plunger and 120
 guard for respectively causing them to approach and recede from the paper.

5. In a side-lay the combination of a member adapted to reciprocate horizontally and
 125 laterally of the feed-board, a foot secured to the said member and adapted to underlie the paper on the feed-board, a plunger vertically reciprocal upon the horizontally-reciprocal member and adapted to grip the paper be- 130
 tween itself and the foot, a guard also verti-

cally reciprocal upon the horizontally-reciprocal member and adapted to approach and recede from the paper, springs and a cam operatively connected with the plunger and guard for respectively causing them to approach and recede from the paper, and a detent in operative connection with the plunger and guard for preventing the springs from depressing these latter.

6. In a side-lay the combination of a member adapted to reciprocate horizontally and laterally of the feed-board, a foot secured to the said member and adapted to underlie the paper on the feed-board, a plunger vertically reciprocal upon the horizontally-reciprocal member and adapted to grip the paper between itself and the foot, a guard also vertically reciprocal upon the horizontally-reciprocal member and adapted to approach and recede from the paper independently of the plunger, springs operatively connected with the plunger and guard for causing them to approach the paper, a stop on the guard for limiting its descent, means in operative connection with the plunger for raising it, and coöperating abutment-surfaces on the plunger and guard to transmit the rising motion from the plunger to the guard.

7. In a side-lay the combination of a member adapted to reciprocate horizontally and laterally of the feed-board, a foot secured to the said member and adapted to underlie the paper on the feed-board, a plunger vertically reciprocal upon the horizontally-reciprocal member and adapted to grip the paper between itself and the foot, a two-part guard also vertically reciprocal upon the horizontally-reciprocal member and adapted to approach and recede from the paper, a screw adjustably connecting together the two parts of the guard, a stop on the guard for limiting its descent, means in operative connection with the plunger for raising it and coöperating abutment-surfaces on the plunger and guard to transmit the rising motion from the plunger to the guard.

8. In a side-lay the combination of a member adapted to reciprocate horizontally and laterally of the feed-board, a foot secured to

the said member and adapted to underlie the paper on the feed-board, a plunger vertically reciprocal upon the horizontally-reciprocal member and adapted to grip the paper between itself and the foot, a guard also vertically reciprocal upon the horizontally-reciprocal member and adapted to approach and recede from the paper, a lever pivoted on the said member and engaging the plunger to raise it, a detent adapted to engage the lever for maintaining the plunger in its raised position, and cams adapted to respectively actuate the lever for raising the plunger, disengage the detent from the lever, and move the before-mentioned member laterally of the feed-board.

9. In a side-lay the combination of a two-part guard adapted to reciprocate horizontally and laterally of the feed-board, one part adjustable relatively to the other, a screw connecting together the two parts for enabling the adjustment to be made, a guide for this two-part member, a spring and cam operatively connected with the said member for reciprocating it on the guide, and adjustable set-screw in operative connection with the guide for limiting the movement imparted to the member by the spring, a foot secured to two-part member and adapted to underlie the paper on the feed-board, a plunger vertically reciprocal upon the two-part member and adapted to grip the paper between itself and the foot, a guard also vertically reciprocal upon the two-part member and adapted to approach and recede from the paper, a lever pivoted on the said member and engaging the plunger to raise it, a detent adapted to engage the lever for maintaining the plunger in its raised position, and cams adapted to respectively actuate the lever for raising the plunger, and disengage the detent from the lever.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

THOMAS M. NORTH.

Witnesses:

WM. SUTHERLAND ROBINSON,
WARWICK HY WILLIAMS.