No. 764,929. PATENTED JULY 12, 1904.

T. C. DEXTER & H. HALLSTREAM.

SHEET REGISTERING MECHANISM FOR PAPER FEEDING MACHINES.

APPLICATION FILED AUG. 28, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1

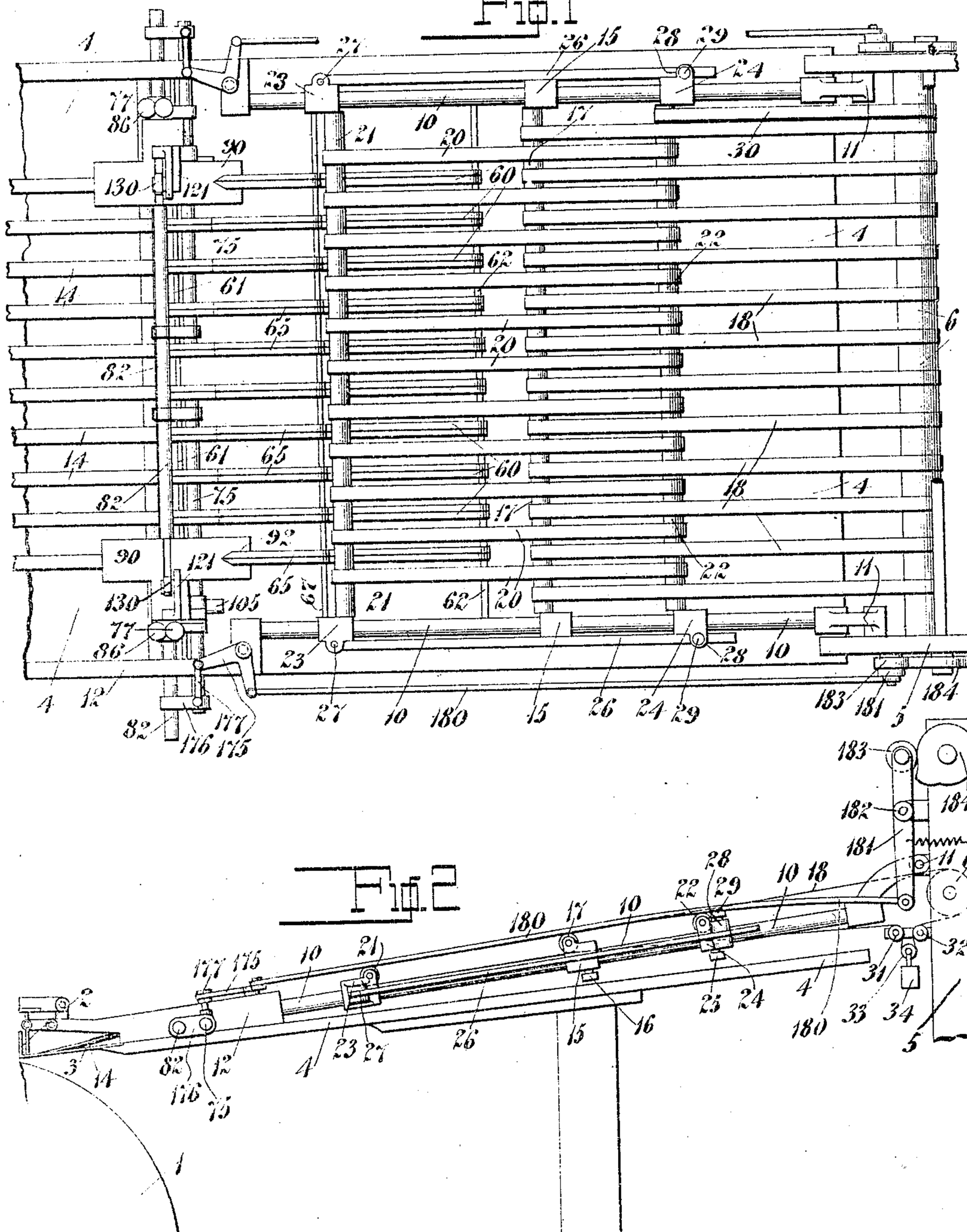

Fig. 2

Witnesses
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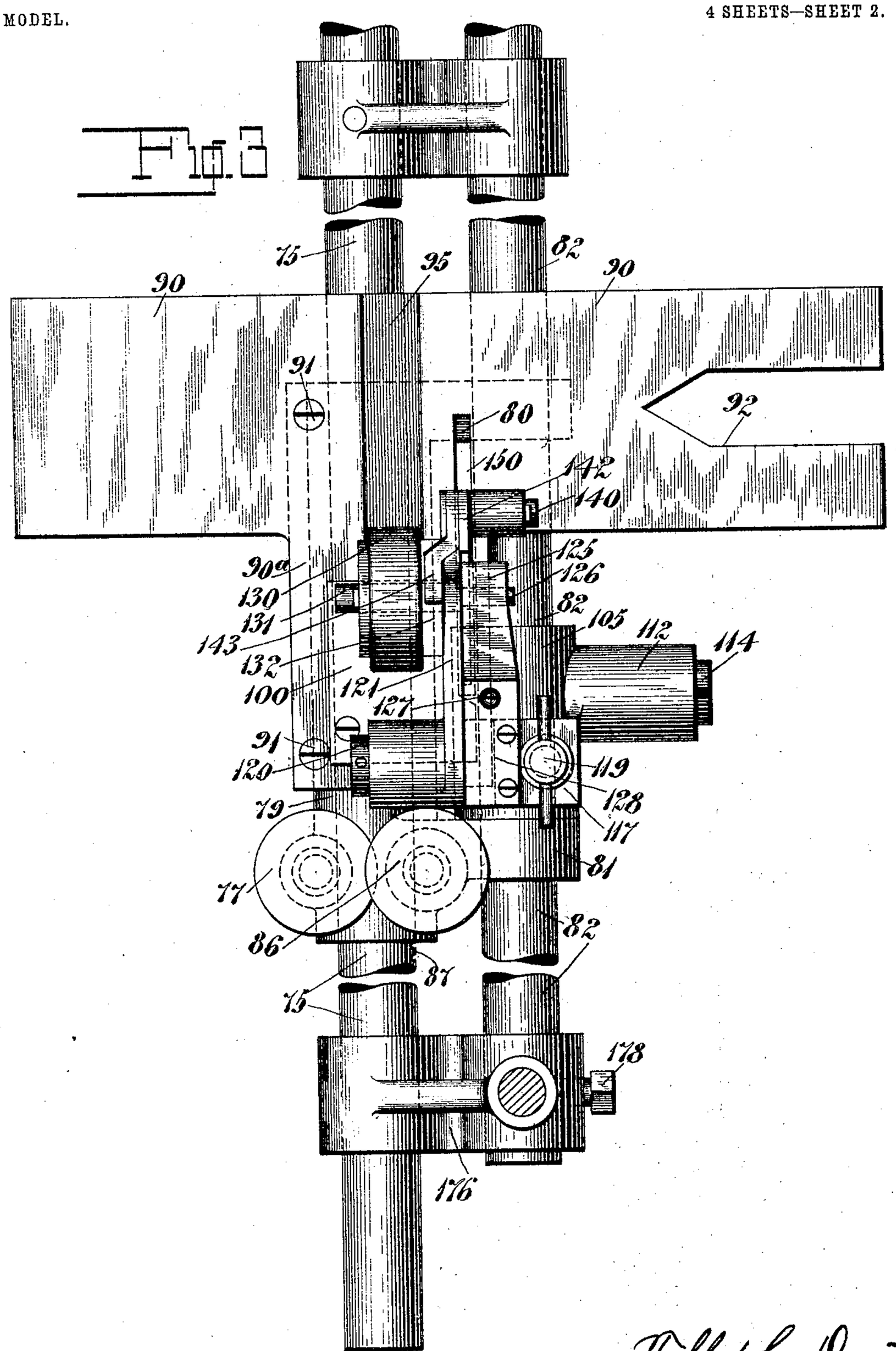
NO MODEL. 4 SHEETS—SHEET 2.

Fig. 3



Witnesses
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NO MODEL. 4 SHEETS—SHEET 3.

Fig. 4

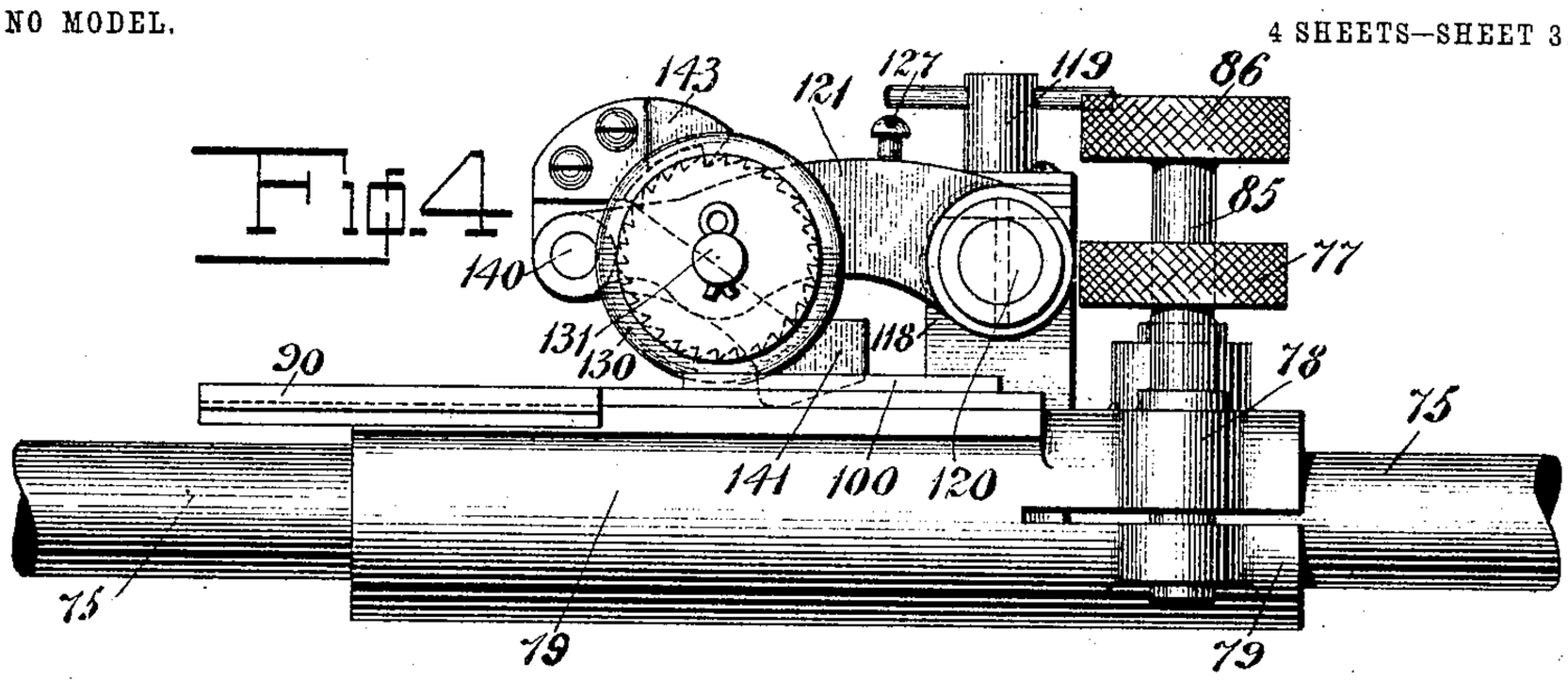


Fig. 5

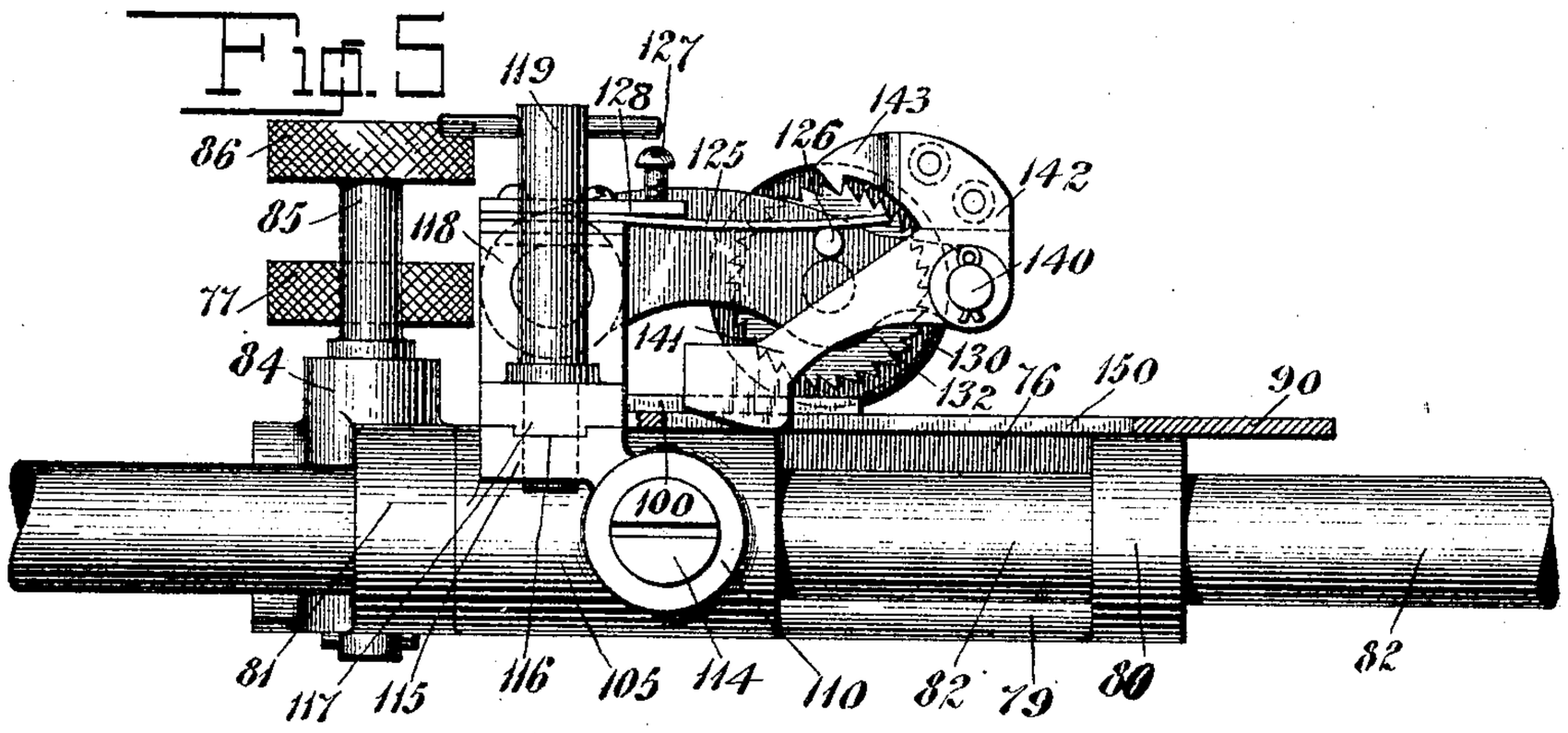
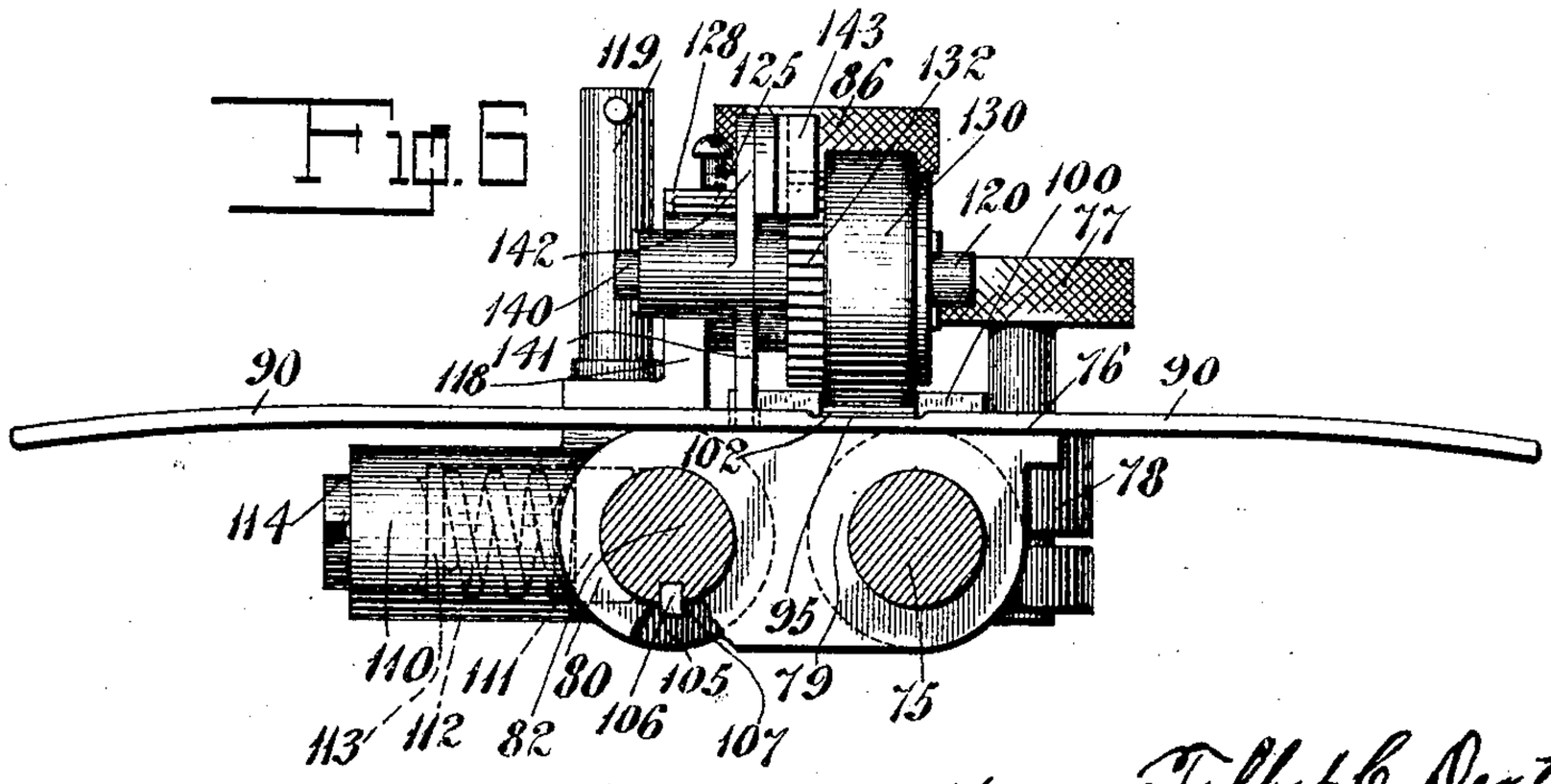


Fig. 6



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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 7

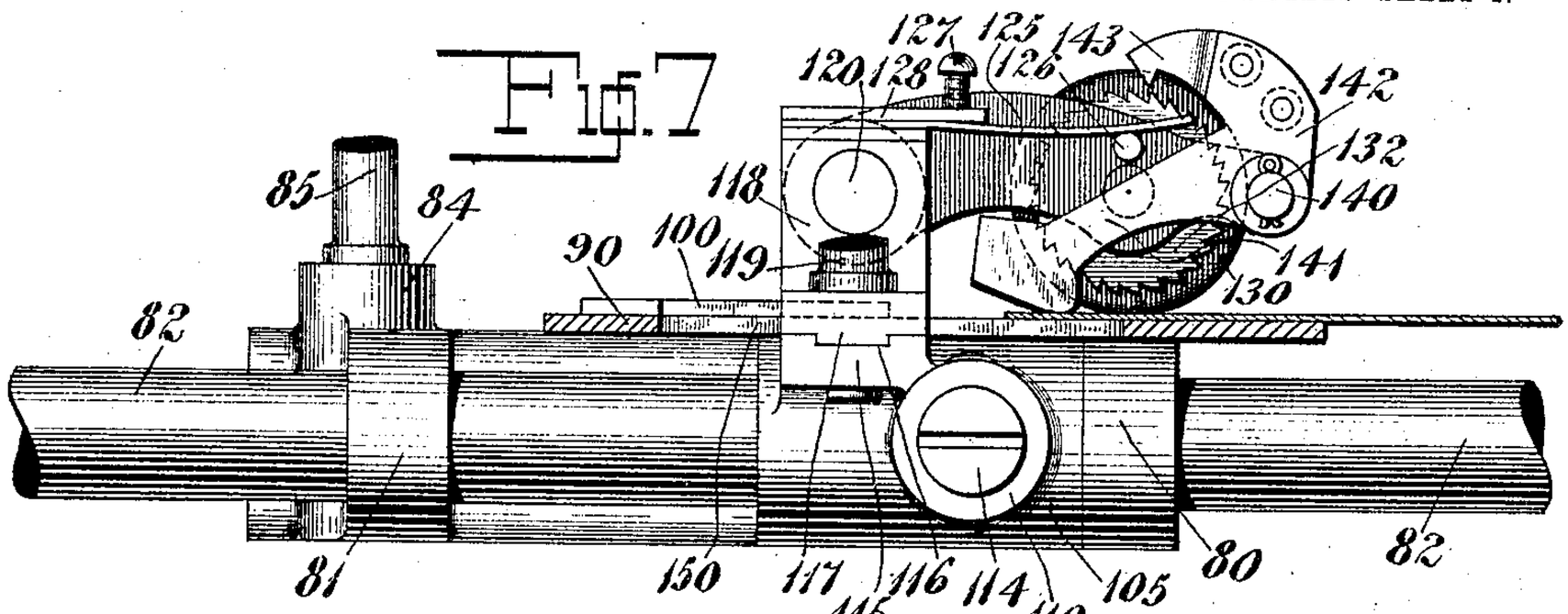


Fig. 8

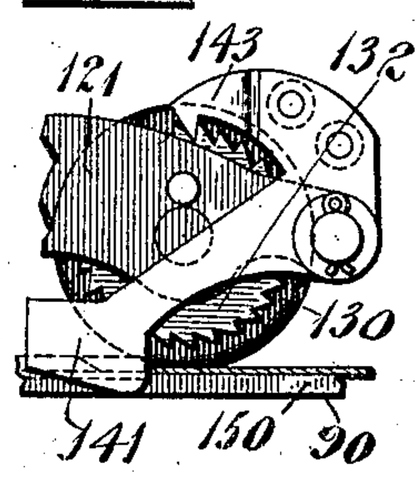


Fig. 9

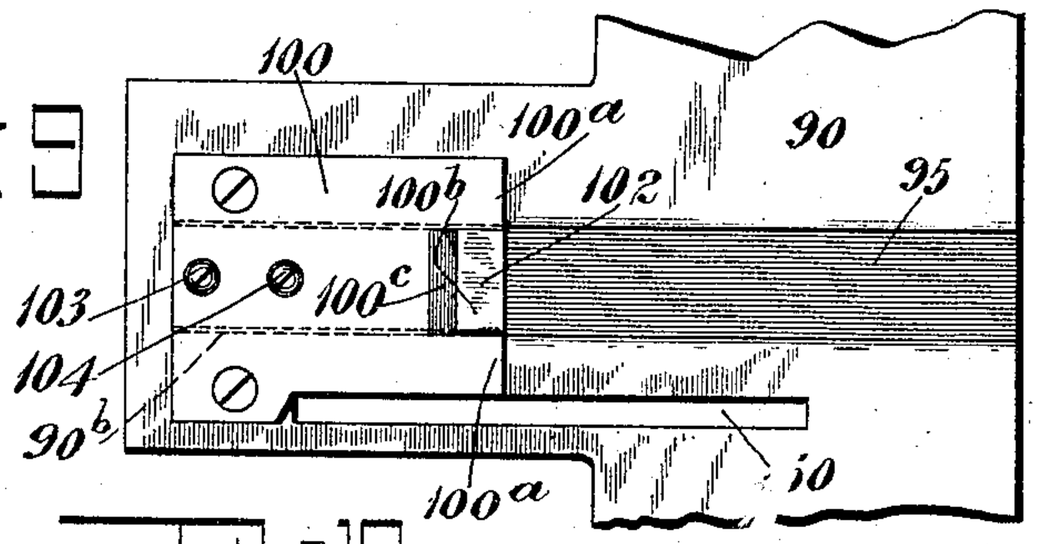


Fig. 10

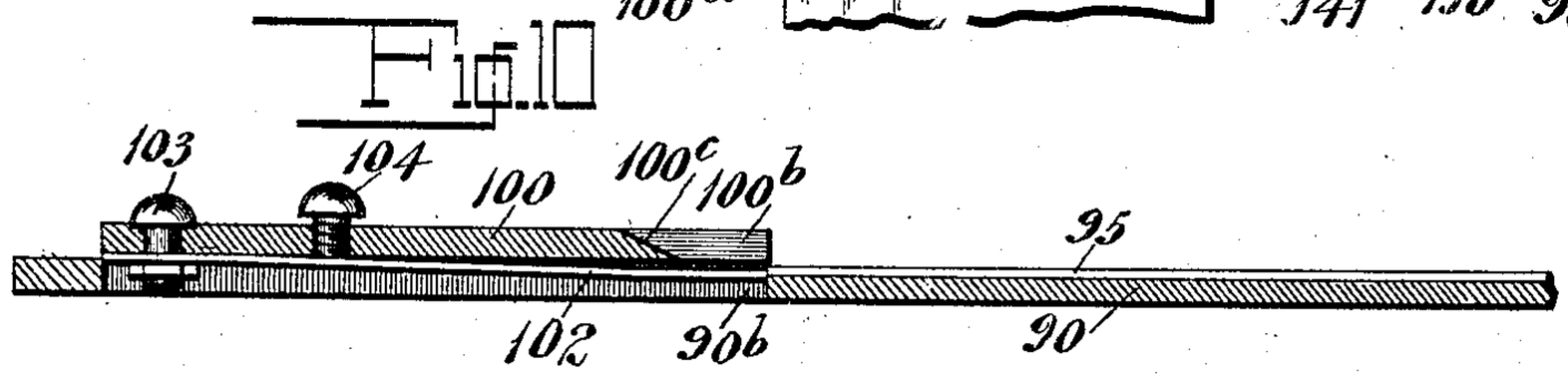
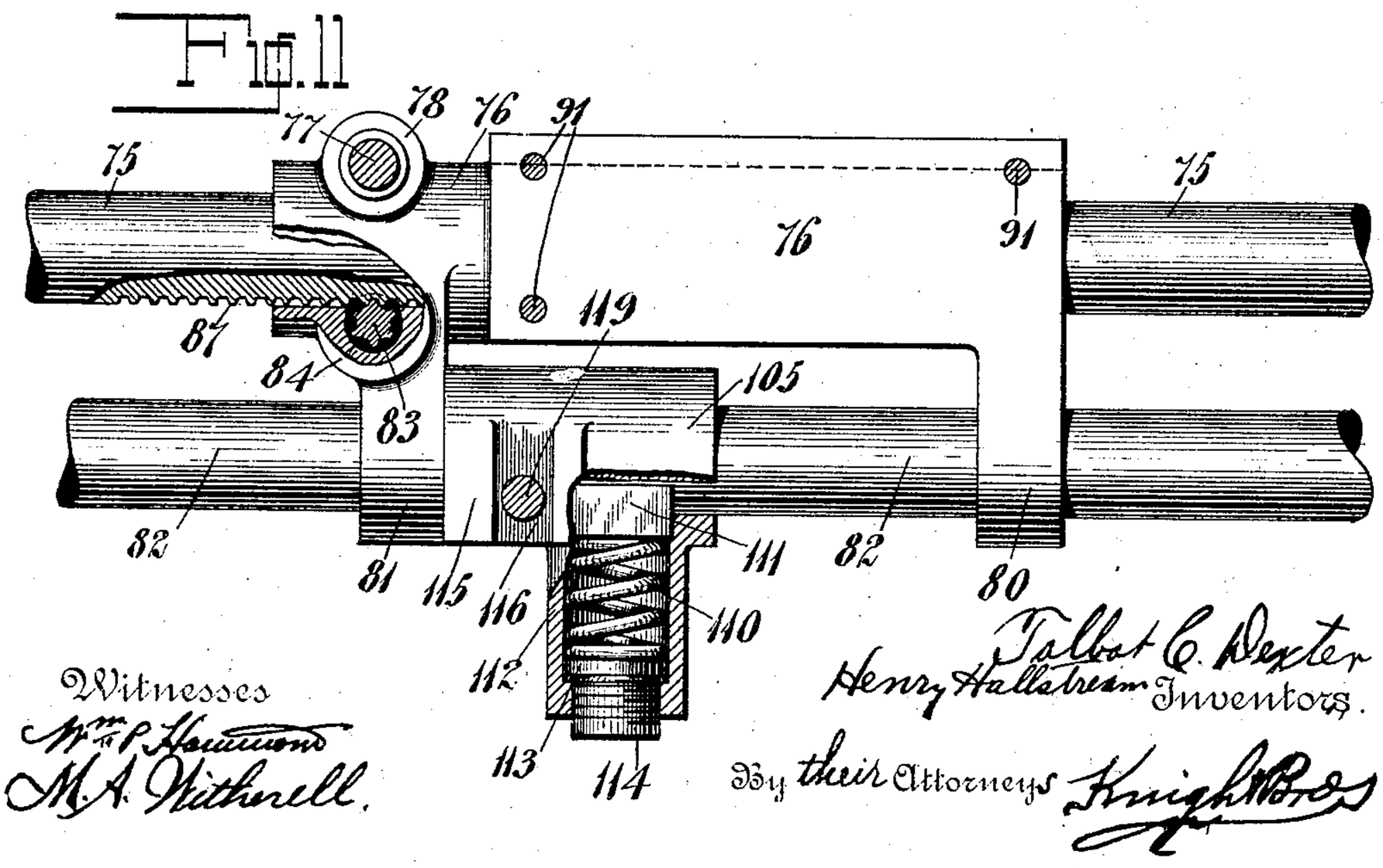


Fig. 11



Witnesses
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No. 764,929. Patented July 12, 1904.

UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER AND HENRY HALLSTREAM, OF PEARL RIVER, NEW YORK; SAID HALLSTREAM ASSIGNOR TO SAID DEXTER.

SHEET-REGISTERING MECHANISM FOR PAPER-FEEDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 764,929, dated July 12, 1904.

Application filed August 28, 1903. Serial No. 171,107. (No model.)

To all whom it may concern:

Be it known that we, TALBOT C. DEXTER and HENRY HALLSTREAM, both citizens of the United States, and residents of Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Sheet-Registering Mechanism for Paper-Feeding Machines, of which the following is a specification.

Our present invention relates generally to improvements in mechanism for accurately moving or adjusting a sheet of paper into register position, and particularly to improvements in mechanism designed to be applied to a sheet-conveyer for registering the successive sheets of paper that are conveyed from an automatic paper-feeding machine to a printing-press, folding-machine, ruling-machine, or other machine designed to operate upon sheets of paper wherein it is necessary that the successive sheets should be properly positioned in transit from the feeding-machine.

Our invention comprises a sheet registering or adjusting instrument which is capable of first moving inwardly over a sheet or a conveyer or other suitable support without buckling or displacing the sheet laterally, then moving outwardly upon the sheet without disturbing the sheet until it reaches its register edge, and finally accurately gripping or engaging the sheet at its extreme register edge on its outward stroke and moving the rigidly-held portion of the register edge of the sheet into engagement with the gage and there releasing the sheet. Our registering instrument is given a sufficient length of stroke to insure the engagement and registry of sheets in the extremes of their lateral positions as supplied to the conveyer or other support from the automatic feeding-machine, the point in the return stroke of the engagement or gripping of the sheet by the instrument depending upon the lateral position of the sheet with relation to the gage. The gripping or engaging of the instrument with the extreme register edge of the sheet insures accuracy of register, for the reason that the part of the sheet which is moved against the gage is held rigidly by the instrument, there being no part of the sheet extending beyond the instrument to be crimped or rumpled between the instrument and gage. The registering instrument is controlled by a sheet-engaging tripper, which moves over the sheet with the instrument and effects the instrument's gripping of the sheet by sliding off the register edge of the sheet on its return or outward stroke.

More specifically, the invention comprises a sheet-supporting plate adjustably mounted at one side of a sheet-conveying frame and arranged to guide the register edge of a sheet over it into operative relation to the registering instrument, a bifurcated or two-part registering gage or plate mounted upon the sheet-supporting plate, a reciprocatory frame upon which is pivoted a spring-pressed finger, a frictional sheet-engaging roll freely journaled upon said finger and adapted to operate in a shallow transverse groove or depression formed in the upper surface of the sheet-supporting plate, a ratchet-wheel secured to the frictional roll, and a controlling pawl or dog pivotally mounted upon the finger in operative relation to the ratchet-wheel and formed with a depending tripping-finger which works in a transverse slot in the sheet-supporting plate, so that when a sheet of paper is presented upon the plate over said slot said tripping-finger by its support upon the sheet will hold the pawl or dog out of engagement with the ratchet-wheel of the friction-roll and allow said roll to move freely over the surface of the sheet in either direction until the tripping-finger moves beyond the register edge of the sheet and falls into the slot, when the pawl or dog will engage the ratchet of the friction-roll and hold the roll against further rotation, so as to cause it to frictionally engage the sheet directly at its register edge. With this construction it will be observed that the frictional roll will engage the sheet at its extreme edge, so as to leave practically no margin projecting beyond the roll, thereby avoiding crimping or buckling the edge of the sheet between the roll and gage when the roll moves the sheet into engagement with the registering-gage.

In order that our invention may be fully understood, we will first describe the same with reference to the accompanying drawings and afterward point out the novelty thereof in the appended claims.

In said drawings, Figure 1 is a detail plan view of part of the sheet-conveying frame of the automatic feeding-machine, showing the application of our improved registering mechanism thereon. Fig. 2 is a side elevation of the same. Fig. 3 is a detail plan view of one of our improved registering mechanisms drawn to a larger scale. Fig. 4 is a detail front elevation of the same. Fig. 5 is a detail rear elevation of the same. Fig. 6 is a detail side elevation of the same looking at the inwardly-presented side of the mechanism. Fig. 7 is a view similar to Fig. 5, showing a shifted position of the operating parts. Fig. 8 is a detail showing a further shifted position of the main parts. Fig. 9 is a detail plan view of a portion of the sheet supporting or registering plate. Fig. 10 is a transverse sectional view of the same. Fig. 11 is a detail plan view having parts broken away, showing the adjustable feature of the reciprocating frame of the sheet-registering mechanism.

We have illustrated our invention as applied to a sheet-conveyer of an automatic paper-feeding machine constructed in accordance with the invention of Talbot C. Dexter, covered by his application, Serial No. 128,715, filed October 25, 1902.

1 represents the impression-cylinder, 2 the front gage, 3 the under guides, and 4 the feed-board, of a printing-press.

5 represents part of the frame of an automatic paper-feeding machine.

6 is the feeding-machine tape-roller driven by a part of the feeding-machine in a manner well understood.

10 represents the side bars of the frame which supports the sheet-conveying mechanism which carries the successive sheets from the feeding-machine to the printing-press or other machine. These bars 10 are pivotally mounted upon the feeding-machine frame at 11 and carry upon their forward ends the side brackets 12, upon which are mounted the side registering mechanism, hereinafter described, and the press-controlling devices, which are partly indicated, but not described in detail, since they do not form any part of our present invention. These side brackets 12 rest upon the feed-board 4 and also carry the metal plates or bars 14, which form an incline leading to the gage end of the feed-board.

15 indicates one of a pair of adjustable brackets or carriages which are mounted upon the side bars 10 and are provided with set-screws 16 for clamping them in the desired adjusted position upon the side bars. Freely journaled in these brackets or carriages 15 and extending from side to side of the machine is a tape-roller 17. The receiving-conveyer tapes 18 pass around the feeder tape-roller 6 and the tape-roller 17.

A second set of adjustable sheet-carrying tapes is provided for transferring sheets from the receiving-tapes 18 to the sheet-supporting rods or bars hereinafter referred to. This second set of tapes 20 is supported on tape-rollers 21 and 22, which are freely journaled, respectively, in the adjustable pairs of brackets or carriages 23 and 24. These brackets or carriages 23 and 24 are mounted upon the side bars 10 of the conveyer-frame, set-screws 25 being threaded into the carriages 23 to engage the side bars 10 and hold the said carriages in the desired adjusted position. Connecting-bars 26 are pivotally mounted upon the ears 27 of carriages 23 and adjustably held in sockets 28 by set-screws 29 upon the carriages 24. By adjusting the carriages 24 upon connecting-rods 26 the tape-roller 22 can be moved toward or away from the tape-roller 21 for loosening or tightening the tapes 20. By means of the adjusting-screw 25 both sets of carriages 23 24 can be adjusted in the plane of feed by sliding upon the side bars 10. This adjustment is for the purpose of bringing the delivery tape-roller 21 nearer to or farther from the registering-gages of the press or other machine to which the conveying mechanism is applied.

The tapes 20 are driven by means of a band or tape 30, passing around the roller 22 and roller 6, the intermediate pulleys 31 32, and belt-tightening pulley 33, carrying the weight 34. The upper carrying portion of tapes 20 is in the same plane as the carrying portion of tapes 18, and the tape-roller 22 is arranged between tape-rollers 6 and 17, so that tapes 20 are interlapped with tapes 18 and can be adjusted in the plane of feed without interfering with the feeding relation between the tapes.

Parallel sheet-supporting bars 60 are mounted at their opposite ends upon transverse rods 61 62, which are secured between the side bars 10 of the conveyer-frame. These main sheet-supporting bars 60, which are formed with angular upper faces, rest in a plane lower than the feeding-plane of the sheet-carrying tapes 18 and 20 and extend from a point a little in front of the tape-roller 17 to a point a little beyond the limit of forward adjustment of the delivery-roller 21 of the second set of tapes 20. These sheet-supporting bars 60 are adapted to receive the successive sheets from the carrying-tapes and deliver them to the final feeding and transferring devices hereinafter described.

65 represents bars or fingers having angular upper faces corresponding to the upper faces or bars 60 and angular grooves 66 in the under faces of their forward ends, which fit snugly over and slide upon bars 60. These fingers 65 are pivotally mounted upon the rod

67, supported in the adjustable carriages 23 of the second set of tapes. Two complete side registering mechanisms are employed on a conveying-machine, one of which is arranged at or adjacent to each side. The structure of each is the same, and but one will be specifically referred to. The operating means for the two mechanisms are independent, and one is disconnected while the other is operating.

Mounted in the side brackets 12 of the conveyer-frame and extending from side to side thereof is a rigid supporting-bar 75. Adjustably mounted upon this supporting-bar at each side of the machine is a registering-bracket 76, which may be clamped in any desired adjusted position by the clamping-screw 77, passing through the integral lugs 78 of the split collar portion 79 of the bracket. This bracket 76 has formed integrally with it the rearwardly-projecting guide-lugs 80 and 81, in which slides the operating-bar 82 of the registering mechanism. Journaled in a suitable socket 83 is a pinion 84, mounted on a vertical pin 85, provided with a milled wheel 86. This pinion 83 meshes with a rack 87, cut in the face of the supporting-bar 75. By loosening up the clamp-screw 77 and rotating the pinion 83 the registering-bracket 76 may be adjusted upon the supporting-bar 75 to any desired position transversely of the machine.

90 is the sheet supporting or registering plate, formed with an integral lateral projection 90^a, which is rigidly secured to the bracket 76 by suitable means, such as the screws 91. This sheet-supporting plate 90 extends longitudinally of the conveyer-frame and is formed with a slot 92 in its rear end to enable it to fit over one of the sheet supporting and guiding fingers 65, as shown in Fig. 1 of the drawings. The ends of the sheet-supporting plate 90 are deflected downwardly to facilitate the passage of the sheet over the plate, the rear slotted end of the plate being bent downwardly sufficiently to intersect the plane of the sheet-supporting fingers 65 to insure the passage of the successive sheets over the plate.

The plate 90 is formed with a shallow transverse groove or depression 95 for the purpose presently to be explained. Rigidly attached to the lateral extension 90^a of the plate is the bifurcated registering-plate 100, formed with the two registering arms or shoulders 100^a and the central slot or recess 100^b, having inclined portion 100^c. The two shoulders 100^a are arranged upon opposite sides of the transverse groove or depression 95 of the sheet-supporting plate for the purpose which will presently be explained. The plate 90 is cut away or slotted at 90^b in line with the shallow depression 95 and directly behind the registering-faces of the arms 100^a. The purpose of the slot 90^b is to receive the auxiliary registering-plate 102, which is secured at 103 to the outer edge of the registering-plate 100 and projects inwardly with its registering-face in the same vertical plane as the registering-faces of the arms 100^a. This registering-plate 102 may be adjusted by a screw 104 to bring its registering edge more or less above the surface of the bottom of shallow recess or groove 95 of the sheet-supporting plate.

105 is a cylindrical head formed with a longitudinal bore which fits upon the reciprocatory operating-bar 82. The head 105 is provided with an internal spline 106, which fits in the longitudinal groove 107 of the bar 82, so that the head 105 can slide upon the bar 82, but cannot turn thereon. The head 105 is confined between the lugs 80 and 81 of the bracket 76, said lugs 80 and 81 being a sufficient distance apart to allow for the working stroke of the bar 82.

Formed integrally with and projecting laterally from the head 105 is a centrally-bored cylindrical lug 110, in which is mounted a frictional block 111, shaped to fit snugly against the bar 82, and a spring 112, engaging the block 111 and adjustably confined within the lug 110 by means of a disk 113 and a screw-plug 114, the latter of which is threaded into the open-threaded end of the lug 110. The purpose of the spring-pressed frictional block 111 is to yieldingly secure the head 105 to the bar 82, so that the head and attached parts, hereinafter referred to, will reciprocate with the bar 82 within the limits of the bracket-lugs 80 and 81. The head 105 is also formed with a horizontal flange 115, formed in its upper face with a square groove or recess 116, in which fits a square key or shoulder 117, formed on the lower face of an angular bracket 118. A screw-post 119 passes through a suitable opening in the angular bracket 118 and is threaded into the flange 115 for detachably securing the bracket to the head 105.

Projecting forwardly from the upright arm of the augular bracket 118 is a pivot-pin 120, upon which is pivoted the inwardly-projecting finger 121. Secured to the upper end of the vertical arm of the angular bracket 118 is a leaf-spring 125, which projects over into engagement with a pin 126, projecting laterally from the pivoted finger 121. A screw 127, threaded through a rigid plate 128 of the bracket 118, engages the spring 125 for adjusting its tension. The spring 125 tends to force the pivoted finger 121 downwardly for holding the sheet-engaging friction-roller in engagement with the sheet-supporting plate to cause it to operate properly.

130 is a frictional sheet-engaging roll freely journaled upon the pin 131, projecting laterally from the finger 121. This friction-roll 130 is formed, preferably, of a suitable rubber which will possess the necessary frictional quality to engage and move a sheet of paper.

Upon one side of the roll 130 is secured the ratchet-wheel 132, by which the rotation of the roll is controlled.

The sheet-engaging roll 130 is supported in line with the shallow groove or recess 95 of the sheet-supporting plate, so that in its travel inwardly and outwardly over the plate it will operate in said groove or recess or upon the portion of a sheet which is supported over said groove or recess. The cut-out portion 100^b between the arms 100^a of the registering-plate 100 being also in line with the groove 95 of the sheet-supporting plate will allow the friction-roll 130 to move outwardly beyond the registering-faces of the registering-plate and up upon the inclined portion 100^c of the registering-plate to raise the roll out of contact with the sheet of paper immediately after the sheet has been registered.

Projecting from the pivoted finger 121 from the side opposite to the friction-roll 130 is a pin 140, upon which is journaled a tripping-finger 141, to the upwardly-projecting flange 142 of which is rigidly secured a pawl or dog 143, which is supported in operative relation to the ratchet-wheel 132 of the sheet-engaging roll 130.

The sheet-supporting plate 90 is formed with a transverse slot 150, into which the tripping-finger 141 projects when said slot is not covered by a sheet in transit through the machine. When the tripping-finger projects into the slot 150, the pawl or dog 143 will be allowed to engage the ratchet-wheel 132 to thereby hold the friction-roll against rotation.

The operating-bar 82 is reciprocated inwardly and outwardly through its supporting-lugs by means of a horizontally-movable bell-crank lever 175, journaled upon the side bracket 12 and connected with the yoked head 176 through the link 177. The head 176 is rigidly secured to the outer end of the reciprocating bar 82 by means of a set-screw 178, said head 176 sliding upon the supporting-shaft 75 to assist in guiding the bar 82 in its movement. The bell-crank lever 175 is connected through a rod 180 with the lower end of the lever 181, journaled to the feeding-machine frame at 182 and carrying in its upper end an antifriction-roller 183, which operates upon the periphery of a rotary cam 184, driven from the feeding-machine. A separate operating mechanism is provided for each registering device, as stated above.

The operation of the device will be clear from the following brief explanation. By loosening the clamping-screw 77 and adjusting the main bracket 76 through the means of the pinion 84 and rack 87 the registering device is placed in proper position to suit the size of sheets to be fed through the machine. The clamping-screw 77 is then again tightened up for holding the mechanism in its adjusted position. When the operation has started, the change in position of the main bracket will necessitate the adjustment of the sliding head 105 upon its operating-bar 82. This is accomplished automatically by reason of the described frictional connection between the head 105 and the bar 82, the engagement of the head 105 with either of the shoulders 80 or 81 causing the head to shift to the required position upon its operating-bar. In the reciprocation inwardly and outwardly of the operating-bar 82 the head 105 carries the sheet-engaging roll, controlling-dog, and tripping-finger inwardly and outwardly over the sheet-supporting plate and sheet which is to be registered. As the mechanism moves inwardly the roll 130 will rotate freely over the supporting-plate and sheet either by reason of the slipping of the ratchet under the pawl or by reason of the disengagement of the pawl from the ratchet by the supporting of the tripping-finger on the sheet. The engagement of the roll with the sheet over the supporting-plate will depress a portion of the sheet into the shallow groove or recess 95 of the plate, thereby enabling the roll to get a better frictional hold upon the sheet when its rotation is arrested upon the return stroke and also serving to stiffen the register edge of the sheet at the point of registry. Upon the outward movement of the mechanism the friction-roll will continue to rotate freely upon the sheet without moving it so long as the tripping-finger is in engagement with and slides upon the sheet; but the instant that the lower edge of the tripping-finger reaches the register edge of the sheet it will descend into the slot 150, and thereby lower the pawl or dog 143 into engagement with the ratchet 132, thus preventing the further rotation of the friction-roll. The shape of the tripping-finger and its arrangement with relation to the roll are such that this frictional hold upon the sheet will take place when the register edge of the sheet is approximately vertically beneath the axis of rotation of the roll. In other words, the roll will frictionally grip a sheet directly at the edge which is to be registered. The device then continues to move outwardly, sliding the sheet transversely across the supporting-plate by reason of the grip of the roll upon the sheet until the register edge of the sheet comes into contact with the registering-arms 100^a and the registering-plate 102. The plate 102 projects above the lower surface of the depression 95 about the thickness of the sheet, or just enough to engage the register edge of the sheet directly beneath the periphery of the friction-roll, and by reason of the engagement of the sheet with the register-faces 100^a and 102, further assisted by the movement of the friction-roll up the incline 100^c of the registering-plate, the sheet will be freed from the registering-roll and allowed to rest in proper register position. The front guides of the press

or other machine are then elevated and the sheet taken off, as in the usual feeding operation.

As stated above, the side-registering mechanism at one side is disconnected and out of operation while the mechanism at the opposite side is operating. To avoid the possibility of interference with the movement of the sheets by the registering mechanism which is out of operation, it is preferable to remove such inactive mechanism from the machine. This is provided for by the screw 119, which detachably secures the bracket 118 of the registering device to the registering-head 105.

Having thus described our invention, the following is what we claim as new therein and desire to secure by Letters Patent:

1. In a device of the character described, the combination of a support for a sheet, a sheet-registering gage, and a sheet-moving instrument provided with a sheet-actuated controlling-tripper and adapted to first move inwardly over a sheet without changing the position of the sheet, then move outwardly to its register edge without shifting the sheet, and finally grip the sheet at its register edge and move it into engagement with the registering-gage, substantially as set forth.

2. In a device of the character described, the combination of a support for a sheet, a sheet-registering gage, and a sheet-moving instrument provided with a controlling-tripper and adapted to first move inwardly over a sheet without shifting the sheet, then move outwardly over the sheet to its register edge without shifting the sheet, and finally grip the sheet at its register edge and move it into engagement with the registering-gage, said controlling-tripper sliding upon the sheet during the inward and outward movements of the instrument to allow the instrument to move freely over the sheet and dropping below the plane of the sheet when it reaches the edge to cause the instrument to grip the sheet, substantially as set forth.

3. In a device of the character described, a sheet-moving instrument having a freely-journaled frictional roll constructed and arranged to roll freely inwardly over a sheet without shifting its position, then roll freely outwardly to the edge of the sheet without shifting its position, and finally frictionally engage or grip the sheet at its extreme edge on its outward movement and move the sheet into registered position, substantially as set forth.

4. In a device of the character described, the combination of a support for a sheet, a registering-gage, and a sheet-moving instrument having a freely-journaled friction-roll and a controlling device, said roll being adapted to first roll freely inwardly over a sheet without shifting its position, then roll freely outwardly to the edge of the sheet without shifting its position, and finally frictionally engage or grip the sheet firmly at its register edge on its outward movement and move the sheet bodily until the register edge of the sheet engages the registering-gage, substantially as set forth.

5. In a device of the character described, the combination of a support for a sheet, a registering-gage, a sheet-moving instrument having a freely-journaled friction-roll and a controlling device, said roll being adapted to first roll freely inwardly over a sheet without shifting its position, then roll freely outwardly to the edge of the sheet without shifting its position, and finally frictionally engage or grip the sheet firmly at its register edge on its outward movement and move the sheet bodily until the register edge of the sheet engages the registering-gage, and means for disengaging the roll from the sheet after the sheet reaches registered position, substantially as set forth.

6. In a device of the character described, the combination of a support for a sheet, a sheet-registering gage, and a sheet-moving instrument provided with a freely-journaled friction-roll and a controlling-tripper, said roll being adapted to roll freely inwardly over a sheet without changing its position, then roll freely outwardly over the sheet to its register edge without changing its position, and finally frictionally engage or grip the sheet at its register edge and move it into engagement with the registering-gage, said controlling-tripper sliding upon the sheet during the inward and outward movements of the instrument and dropping beneath the plane of the sheet when it reaches the register edge to hold the friction-roll against rotation and cause it to grip the sheet, substantially as set forth.

7. In a device of the character described, the combination of a support for a sheet, a registering-gage, and a reciprocatory sheet-moving instrument having a freely-journaled frictional sheet-engaging roll which operates above said support, a ratchet-wheel secured to said roll, a pawl or dog pivoted upon the instrument in operative relation to the ratchet-wheel, and a sheet-controlled tripping-finger connected with the pawl or dog, said roll, under the control of the pawl or dog and tripping-finger, being adapted to roll freely inwardly over a sheet without shifting its position, then roll freely outwardly over the sheet to its edge without shifting its position, and finally frictionally engage or grip the sheet firmly at its register edge on its outward movement and move the sheet bodily until the register edge engages the registering-gage, substantially as set forth.

8. The combination of a sheet-support, with a reciprocatory sheet-moving instrument having a freely-journaled frictional sheet-engaging roll which operates above said support, and a controlling device mounted upon said instrument normally tending to hold the roll against rotation to cause it to frictionally engage and move a sheet and adapted, when it

engages a sheet, to release the roll and allow it to roll freely over the sheet, substantially as set forth.

9. The combination of a sheet-support, with a reciprocatory sheet-moving instrument having a freely-journaled frictional sheet-engaging roll which is supported above said plate, and a roll-controlling device mounted upon said instrument, the roll and controlling device being adapted to move freely over a sheet in either direction without shifting the sheet and the controlling device being adapted, when it moves out of engagement with the sheet, to hold the roll against rotation and cause it to frictionally engage and move the sheet, substantially as set forth.

10. The combination of a sheet-support and a sheet-registering gage, with a reciprocatory sheet-moving instrument having a freely-journaled frictional sheet-engaging roll which is supported above said plate, and a roll-controlling device mounted upon said instrument, the roll and controlling device being adapted to move freely over a sheet in either direction while the controlling device is in contact with the sheet, and the controlling device being adapted, when it moves out of engagement with the sheet, to hold the roll against rotation to cause it to frictionally engage and move the sheet into engagement with the registering-gage, substantially as set forth.

11. The combination of a sheet-supporting plate, with a reciprocatory sheet-moving instrument including a freely-journaled frictional roll which is supported above said plate, and a device mounted upon said sheet-moving instrument adapted to engage the roll to prevent its rotation and formed with a part which is adapted to engage and slide upon a sheet for holding said device out of engagement with the roll while said part is in engagement with the sheet, substantially as set forth.

12. The combination of a slotted sheet-supporting plate, with a reciprocatory sheet-moving instrument having a freely-journaled frictional roll which is adapted to operate above the sheet-supporting plate, a tripping device freely journaled upon said instrument in proper position to engage the roll and prevent its rotation, and projecting into the slot of the sheet-supporting plate in position to be controlled by the sheet being operated upon, whereby said roll will rotate freely over the sheet while said tripping device is resting upon the sheet and will be held against rotation so as to frictionally engage the sheet when said device moves out of contact with the sheet, substantially as set forth.

13. The combination of a slotted sheet-supporting plate, with a reciprocatory sheet-moving instrument having a freely-journaled frictional roll which is adapted to operate above the sheet-supporting plate, a dog freely journaled upon said instrument and adapted to prevent the rotation of said roll, and an arm projecting from said dog into the slot of the sheet-supporting plate in position to be controlled by the sheet being operated upon, whereby said roll will rotate freely over the sheet while said arm is resting upon the sheet and will be held against rotation to frictionally engage the sheet when the arm moves out of contact with the sheet, substantially as set forth.

14. The combination of a slotted sheet-supporting plate, with a reciprocatory sheet-moving instrument having a freely-journaled frictional roll which is adapted to operate above the sheet-supporting plate, a ratchet-wheel secured to the roll, a dog freely journaled upon said instrument in proper position to engage the ratchet-wheel and prevent the rotation of the roll, and an arm projecting from said dog into the slot of the sheet-supporting plate in position to be controlled by the sheet being operated upon, whereby said roll will rotate freely over the sheet while said arm is resting upon the sheet and will be held against rotation to frictionally engage the sheet when the arm moves out of contact with the sheet, substantially as set forth.

15. The combination of a sheet-support and a registering-gage, with a reciprocatory sheet-moving instrument including a freely-journaled frictional roll which is supported above said plate, and a device mounted upon said sheet-moving instrument adapted to engage the roll to prevent its rotation and formed with a part which is adapted to engage and slide upon a sheet for holding said device out of engagement with the roll while said part is in engagement with the sheet, said roll being adapted, when held against rotation, to frictionally engage and move a sheet into contact with the gage, and means for disengaging the roll from the sheet when the sheet reaches registered position, substantially as set forth.

16. The combination of a sheet-supporting plate, with a reciprocatory sheet-moving instrument including a freely-journaled frictional roll which is supported above said plate, means for imparting a uniform stroke to said instrument, and a device mounted upon said sheet-moving instrument adapted to engage the roll to prevent its rotation and formed with a part which is adapted to engage and slide upon a sheet for holding said device out of engagement with the roll while said part is in engagement with the sheet, substantially as set forth.

17. The combination of a sheet-supporting plate formed with a shallow groove or depression, a sheet-moving instrument adapted to reciprocate over said sheet-supporting plate parallel with said shallow groove or depression, a frictional sheet-moving roll freely journaled upon said instrument and adapted to operate in said shallow groove or depression, and a sheet-controlled device adapted to hold said roll against rotation to cause it to

frictionally engage a sheet, substantially as set forth.

18. In a device of the character described, the combination of a sheet-supporting plate, a sheet-registering gage arranged upon said plate, a reciprocatory sheet-moving instrument operating above said plate toward and away from the gage, and an inclined surface upon said plate adjacent to the gage with which the sheet-moving instrument engages to free itself from a sheet, substantially as set forth.

19. In a device of the character described, the combination of a sheet-supporting plate formed with a shallow groove or depression, a sheet-registering gage arranged upon said plate adjacent to said groove or depression, an inclined surface upon said plate in line with said groove or recess, and a sheet-moving instrument operating in said groove or depression and upon said inclined surface, substantially as set forth.

20. The combination of a slotted sheet-supporting plate, with a reciprocatory sheet-moving instrument having a freely-journaled frictional roll, a ratchet-wheel secured to said roll, a dog freely journaled upon the instrument in operative relation to the ratchet of the roll, and an arm rigidly attached to the dog and projecting into the slot of said sheet-supporting plate in position to engage and be controlled by the sheet, substantially as set forth.

21. The combination of a sheet-supporting plate formed with a shallow groove or depression and a slot extending parallel with said groove or depression, with a reciprocatory sheet-moving instrument having a freely-journaled frictional roll which operates in said groove or depression, a ratchet-wheel secured to said roll, a dog freely journaled upon the instrument in operative relation to the ratchet of the roll, and an arm rigidly attached to the dog and projecting into the slot of said sheet-supporting plate in position to engage and be controlled by the sheet, substantially as set forth.

22. The combination of a sheet-supporting plate, a sheet-registering flange or shoulder arranged at one edge of said plate, a reciprocatory sheet-moving instrument movable to and fro above said plate, a freely-journaled frictional roll mounted upon said instrument and movable toward and away from the registering flange or shoulder, and a sheet-controlling device mounted upon said instrument and adapted to prevent the rotation of said roll, substantially as set forth.

23. The combination of a sheet-supporting plate having a sheet-registering flange or shoulder, with a reciprocatory frame, a sheet-moving finger journaled upon said frame and projecting over said plate, a frictional sheet-engaging roll freely journaled upon said finger and supported thereby above said plate, a spring engaging said finger and holding the roll yieldingly in contact with said plate, and a sheet-controlled device adapted to hold said roll against rotation, substantially as set forth.

24. The combination of a sheet-supporting plate having a sheet-registering flange or shoulder, with a reciprocatory frame, a sheet-moving finger journaled upon said frame and projecting over said plate, a frictional sheet-engaging roll freely journaled upon said finger and supported thereby above said plate, a spring engaging said finger and holding the roll yieldingly in contact with said plate, means for adjusting the tension of said spring, and a sheet-controlled device adapted to hold said roll against rotation, substantially as set forth.

25. The combination of a sheet-supporting plate, formed with a shallow groove or depression, a bifurcated sheet-registering plate mounted thereon with its sheet-registering arms or shoulders upon opposite sides of said groove or depression, a sheet-registering blade supported between the arms of said bifurcated registering-plate and in line with said groove or depression, a reciprocatory sheet-moving instrument including a freely-journaled frictional roll which is supported to operate in said groove or depression toward and away from said sheet-registering shoulders, and a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold said roll against rotation and cause it to frictionally engage a sheet, substantially as set forth.

26. The combination of a sheet-supporting plate, a bifurcated sheet-registering plate mounted thereon, a reciprocatory sheet-moving instrument including a freely-journaled frictional roll which is supported to operate above the sheet-supporting plate toward and away from said sheet-registering plate and between the arms or shoulders of the latter, and a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold said roll against rotation and cause it to frictionally engage a sheet, substantially as set forth.

27. The combination of a sheet-supporting plate, a bifurcated sheet-registering plate mounted thereon and formed with an inclined surface between the registering arms or shoulders, a reciprocatory sheet-moving instrument including a freely-journaled frictional roll which is supported to operate above the sheet-supporting plate toward and away from said sheet-registering plate and upon said inclined surface between the arms or shoulders of the latter, and a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold said roll against rotation and cause it to frictionally engage a sheet, substantially as set forth.

28. The combination of a sheet-supporting plate, formed with a shallow groove or depression, a bifurcated sheet-registering plate

mounted thereon with its sheet-registering arms or shoulders upon opposite sides of said shallow groove or depression, a reciprocatory sheet-moving instrument including a freely-journaled frictional roll which is supported to operate in said groove or depression toward and away from said sheet-registering plate, and a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold said roll against rotation and cause it to frictionally engage a sheet, substantially as set forth.

29. The combination of a sheet-supporting plate, with a reciprocatory sheet-moving instrument including a freely-journaled friction-roll, a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold the roll against rotation, and a sheet-registering blade mounted upon the sheet-supporting plate in the plane of movement of said roll and with its register edge slightly above the surface of the plate, substantially as set forth.

30. The combination of a sheet-supporting plate, with a reciprocatory sheet-moving instrument including a freely-journaled friction-roll, a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold the roll against rotation, a sheet-registering blade mounted upon the sheet-supporting plate in the plane of movement of said roll and with its register edge slightly above the surface of the plate, and means for adjusting said registering-blade with reference to the sheet-supporting plate, substantially as set forth.

31. The combination of a sheet-supporting plate, with a reciprocatory sheet-moving instrument including a freely-journaled friction-roll, a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold the roll against rotation, a sheet-registering blade mounted upon the sheet-supporting plate in the plane of movement of said roll and with its register edge slightly above the surface of the plate, and an inclined surface adjacent to the registering-blade with which said roll engages to free it from a sheet, substantially as set forth.

32. The combination of a sheet-supporting plate formed with a shallow groove or depression and a slot adjacent to one end of said depression, a sheet-registering blade mounted upon said plate in said slot with its register edge arranged a little above the bottom of said groove or depression, a reciprocatory sheet-moving instrument including a freely-journaled friction-roll which is supported to operate in said groove or depression and over said registering-blade, and a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold said roll against rotation, substantially as set forth.

33. The combination of a sheet-supporting plate formed with a shallow groove or depression and a slot adjacent to one end of said depression, a sheet-registering blade mounted upon said plate in said slot with its register edge arranged a little above the bottom of said groove or depression, an inclined surface arranged adjacent to said registering-blade, a reciprocatory sheet-moving instrument including a freely-journaled friction-roll which is supported to operate in said groove or depression and over said registering-blade and inclined surface, and a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold said roll against rotation, substantially as set forth.

34. The combination of a sheet-supporting plate formed with a shallow groove or depression and a slot adjacent to one end of said depression, a bifurcated registering-plate mounted upon the sheet-supporting plate adjacent to said slot with its two registering arms or shoulders arranged upon opposite sides of said groove or depression, a sheet-registering blade mounted upon said plate in said slot between the two arms or shoulders of the registering-plate and with its register edge arranged a little above the bottom of said groove or depression, an inclined surface formed upon the registering-plate between its two arms or shoulders, a reciprocatory sheet-moving instrument including a freely-journaled friction-roll which is supported to operate in said groove or depression and over said registering-blade and inclined surface, and a sheet-controlled device mounted upon the sheet-moving instrument and adapted to hold said roll against rotation, substantially as set forth.

35. The combination of a conveyer for sheets of paper, and suitable front guides arresting the movement of said paper, with a registering-plate supported at one side of said conveyer in the path of sheets, and a reciprocatory sheet-moving instrument having a freely-journaled frictional roll which is adapted to operate above said registering-plate, and sheet-controlled means for holding said roll against rotation, substantially as set forth.

36. The combination of a conveyer for sheets of paper, and suitable front guides arresting the movement of said paper, with a registering-plate supported at one side of said conveyer in the path of the sheets, a side registering-gage upon said plate, and a reciprocatory sheet-moving instrument having a freely-journaled frictional roll which is adapted to operate above said registering-plate, and sheet-controlled means for holding said roll against rotation, substantially as set forth.

37. In a device of the character described, the combination of a supporting-frame, a bracket adjustably mounted upon said frame, a reciprocatory operating-bar, a head adjustably mounted on said bar, parts projecting from said bracket into the path and upon opposite sides of the head to limit the movement of the head in both directions, a friction

device upon said head engaging said bar for yieldingly holding the head in position upon the bar and causing the head to normally move with the bar, said friction device allowing the head to move upon the bar when the head engages one of said parts projecting from the bracket, and a sheet-moving device mounted upon said head and operated thereby, substantially as set forth.

38. In a device of the character described, the combination of a supporting-frame, a bracket adjustably mounted upon said frame, arms or lugs projecting from said bracket, a sheet supporting and registering plate mounted upon said bracket, a reciprocatory bar operating through said arms or lugs, a head adjustably mounted upon said bar between said arms or lugs, a friction device upon said head engaging said bar for yieldingly holding the head in position upon the bar and causing the head to normally move with the bar, said friction device allowing the head to move upon the bar when the head strikes one of said arms or lugs, and a sheet-registering device mounted upon said head and supported thereby in operative relation to the registering-plate, substantially as set forth.

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Witnesses:
JOSEPH J. SCHMIDT,
WM. E. KNIGHT.