T. C. DEXTER.

SHEET REGISTERING MECHANISM FOR PAPER FEEDING MACHINES.

APPLICATION FILED JUNE 9, 1909.

975,606.

Patented Nov. 15, 1910.

5 SHEETS—SHEET 1.

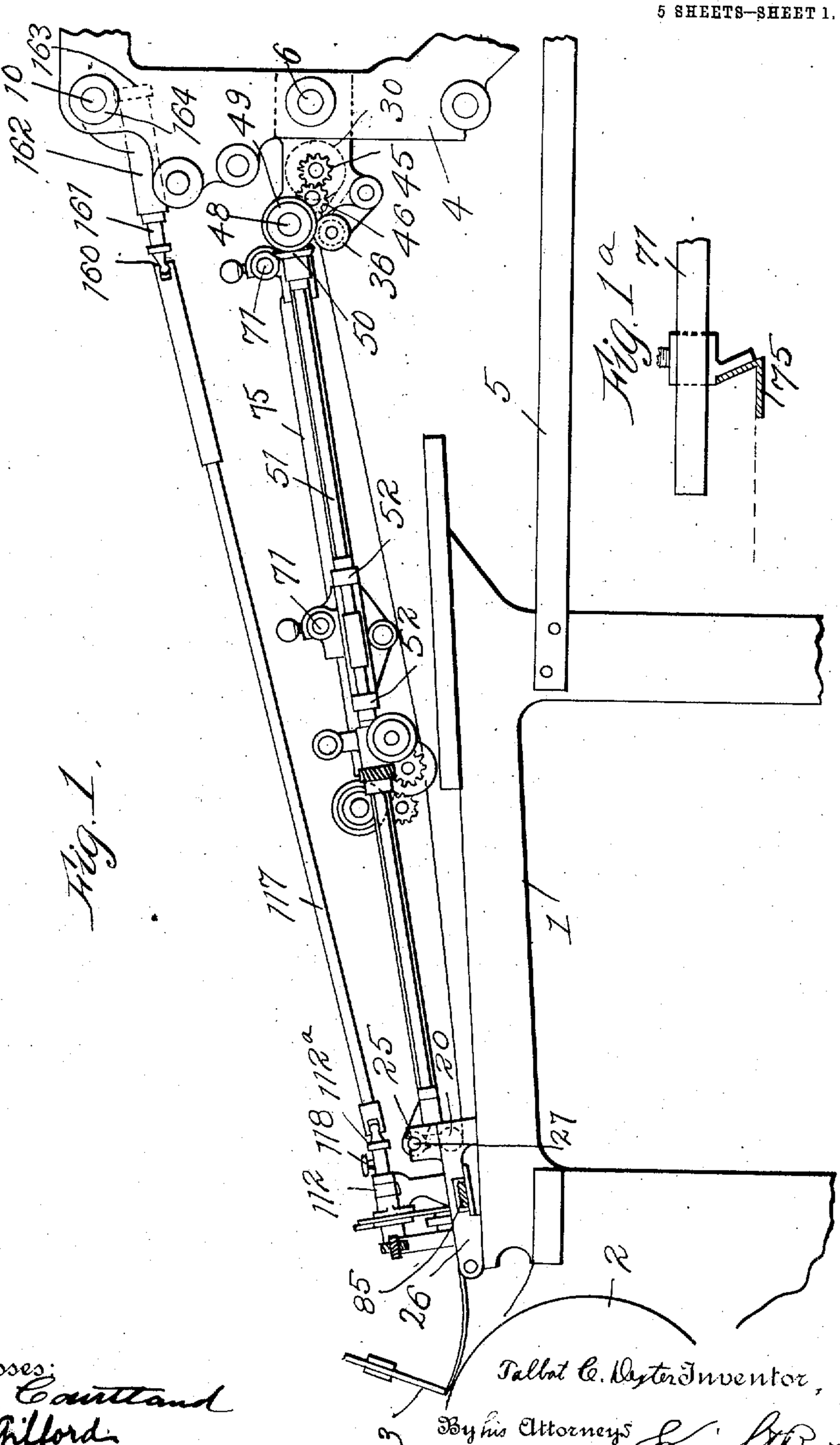

Fig. 1.

Fig. 1a.

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6 SHEETS—SHEET 2.

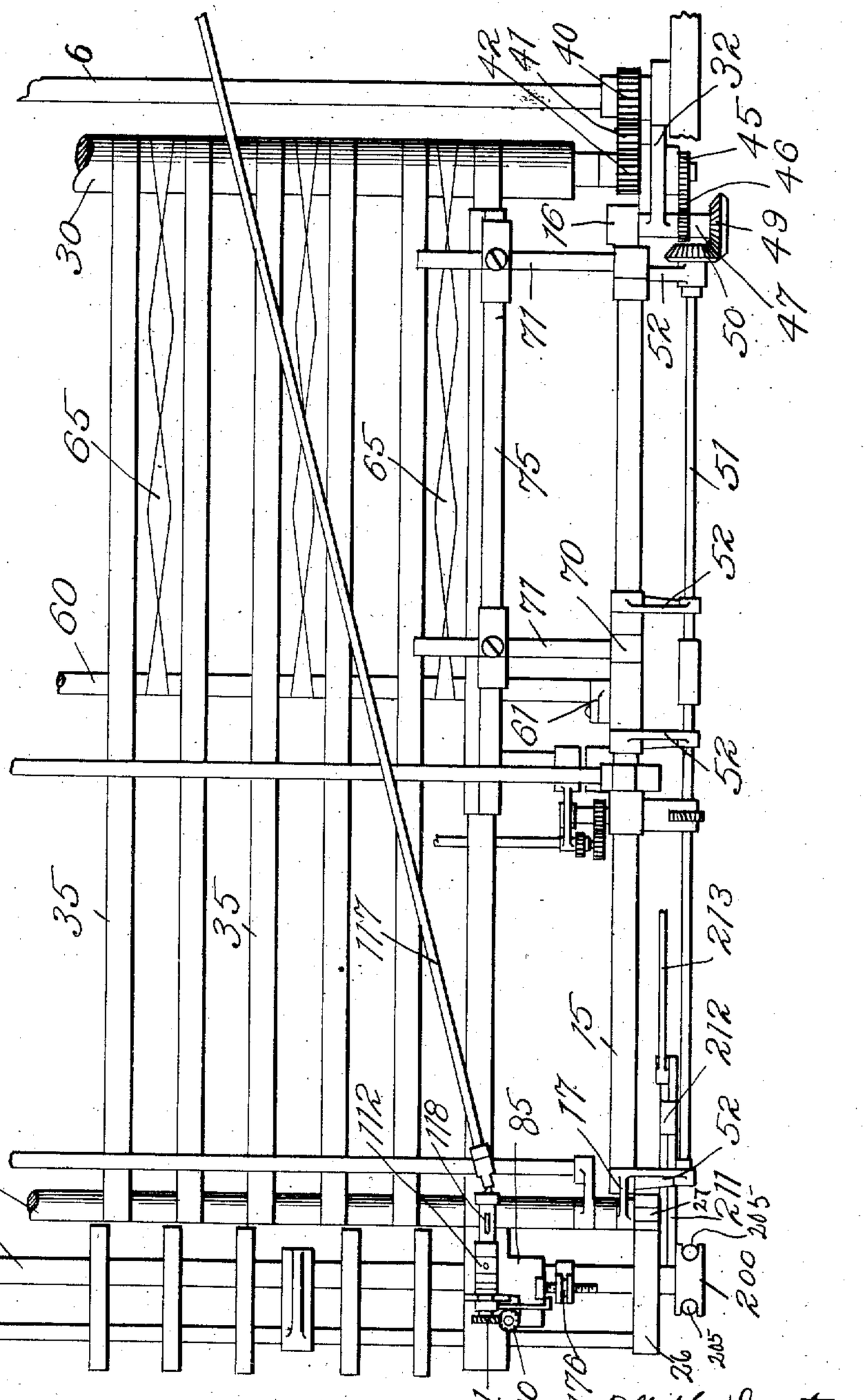

Fig. 2.

Witnesses:
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5 SHEETS—SHEET 3.

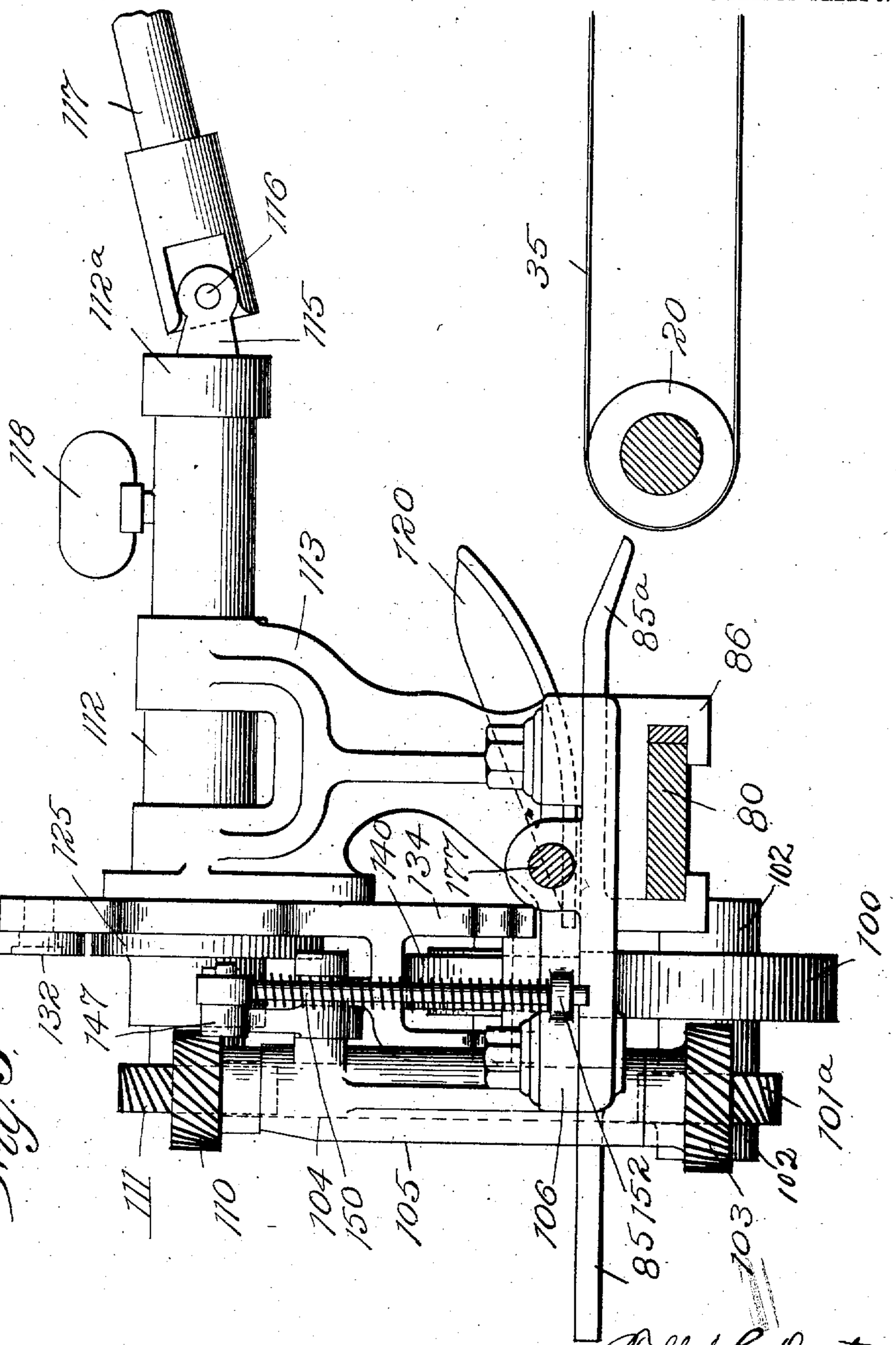

Fig. 3.

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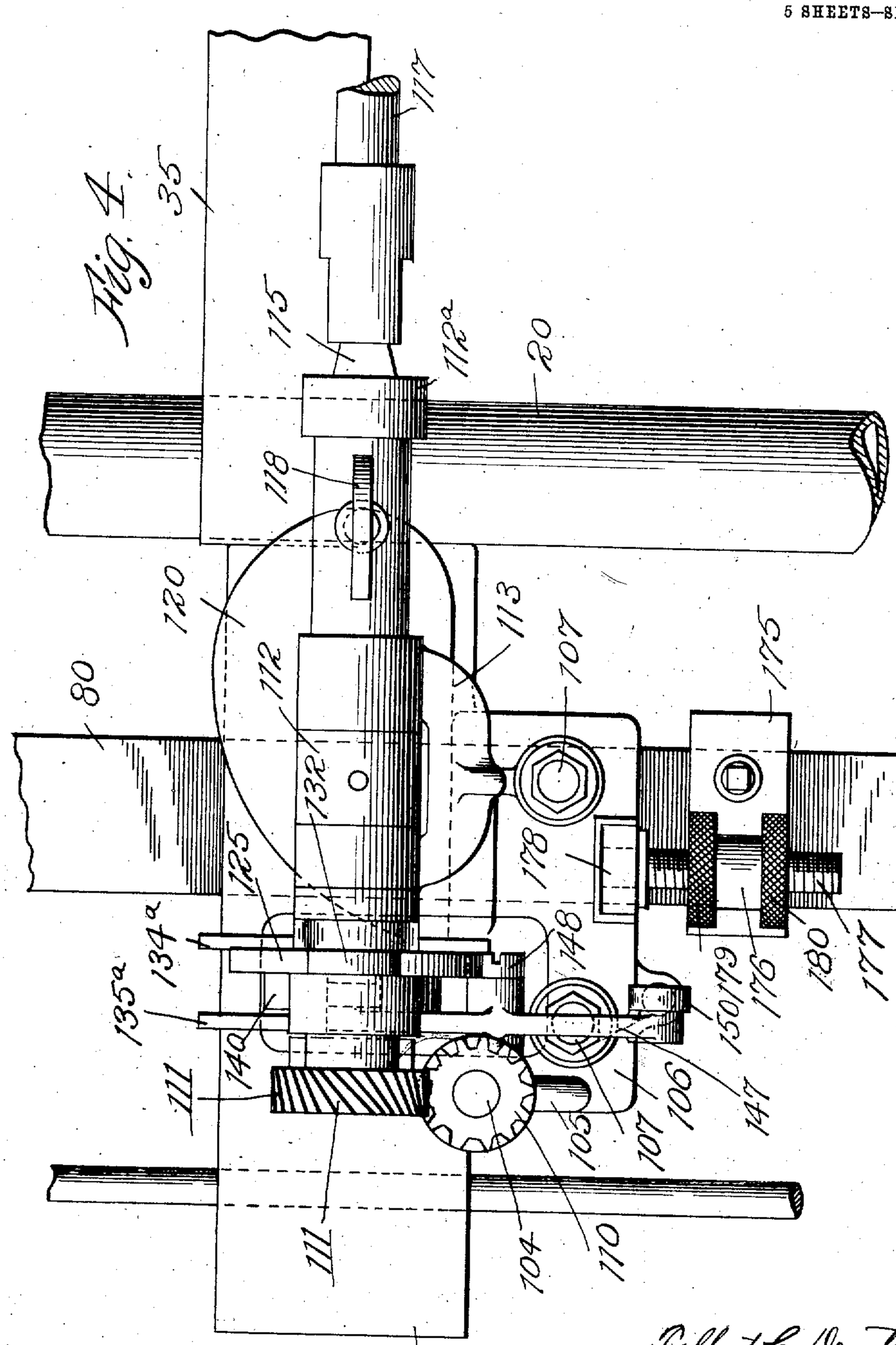
5 SHEETS—SHEET 4.

Fig. 4.



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5 SHEETS—SHEET 5.

Fig. 5.

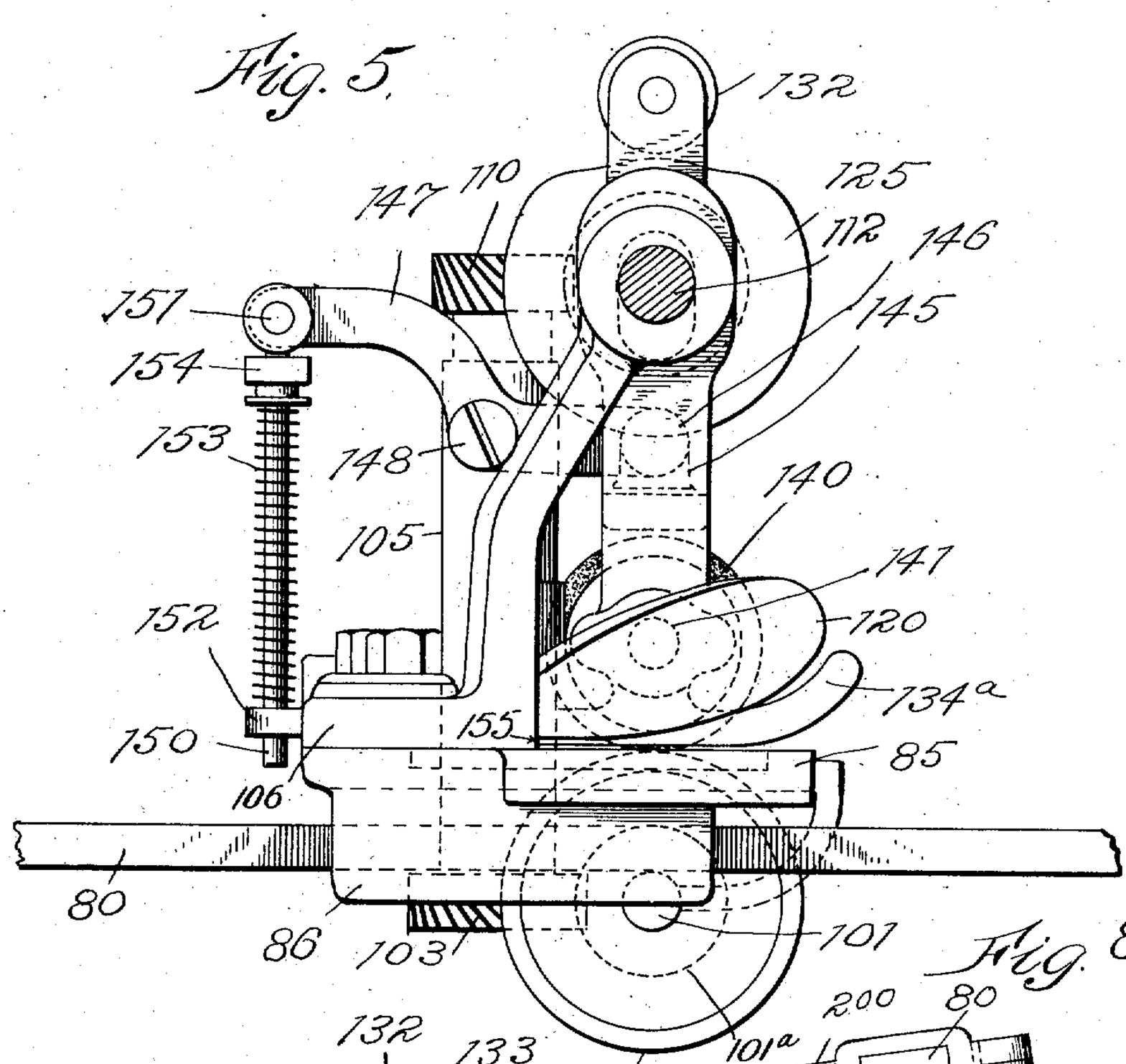

Fig. 6.

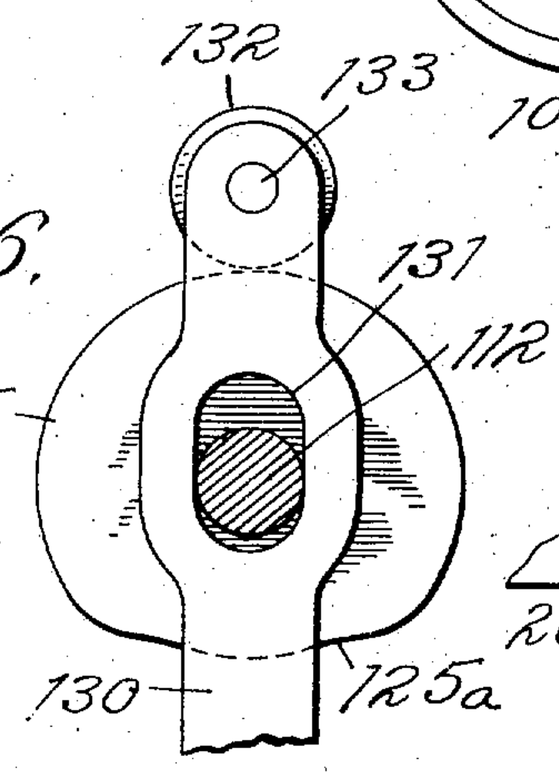

Fig. 8.

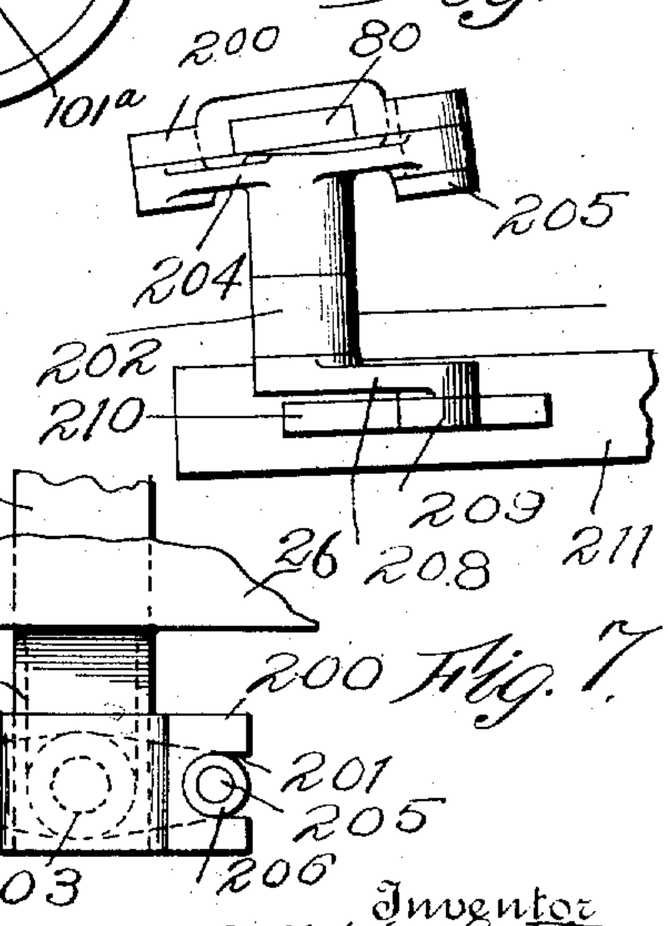

Fig. 7.

Witnesses:
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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK, ASSIGNOR TO DEXTER FOLDER COMPANY, OF PEARL RIVER, NEW YORK, A CORPORATION OF NEW YORK.

SHEET-REGISTERING MECHANISM FOR PAPER-FEEDING MACHINES.

975,606. Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed June 9, 1909. Serial No. 501,092.

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen of the United States, and residing at 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.

The recent developments in printing machinery have necessitated greater rapidity in the operation of automatic paper feeding machines and at the same time the accurate registry of the sheets fed to the press. This is true with particular reference to the offset press, which is most usually designed for the rapid printing of relatively small sheets. In the operation of this offset printing press, a sheet must be fed to the press for each revolution of the impression cylinder, and since the length of sheets to be printed is frequently but little less than the circumference of the impression cylinder and the press is run at a very high speed, it naturally follows that but little time is afforded for the registry of the sheets at the gages of the press. For instance in some cases to which my attention has been directed, the sheet to be printed is only nine or ten inches shorter than the circumference of the impression cylinder which is operated at a speed of from 3,000 to 5,000 sheets per hour. In this particular instance, there was not sufficient time between the arrest of the sheet at the press gages and the action of the cylinder grippers in taking a sheet to side register the sheet more than $\frac{1}{8}$ or $\frac{1}{4}$ of an inch, even with a very rapidly operating side registering mechanism.

The difficulty in presenting sheets rapidly and accurately to this type of printing press is solved by the present invention. which consists broadly in providing upon a conveyer frame arranged between an automatic paper feeding machine and a printing press, two sheet registering mechanisms. arranged to act successively upon the sheets. the first one of which serves to effect a preliminary registry or lateral positioning of the sheet while it is rapidly advancing upon the conveyer for the purpose of placing the sheet sufficiently near its final registered position at the gages to enable the second registering mechanism to accurately complete the registering operation, and the second registering mechanism operates upon the sheet at the gages to place it in exact registry position.

In the preferred embodiment of my present invention, I provide the usual form of sheet conveyer with a preliminary side registering flange or plate arranged parallel with the direction of travel of the sheets at the leading end of the conveyer, and a plurality of twisted tapes extending a portion of the length of the conveyer so as to have a side registering tendency to place the registering edge of the sheet against said registering plate or flange while the sheet is rapidly moving from the feeding machine to the press gages; and at the delivery end of the conveyer frame I provide a rapidly acting sheet registering device comprising preferably a side registering gage or face and coöperating registering rollers between which the sheets are passed, and an operating mechanism for rotating said rollers and for intermittently moving them into and out of peripheral engagement with a sheet to cause them to quickly engage a sheet and shift it laterally into final registered position immediately after it has touched the front gages of the press, and then release it in its registered position just prior to the elevation of the press gages and the closing of the cylinder grippers. In this preferred embodiment of my invention, the final registering rollers include a constantly driven smooth-surfaced metal roller arranged beneath the plane of feed of the sheets, a coöperating frictionally driven rubber-faced upper roller mounted upon a movable support or frame, and a rotary cam for intermittently raising and lowering said upper roller to cause it to engage a sheet for registering it and release the sheet after it is registered. With this improved mechanism, it will be observed that while the sheet is rapidly advancing upon the sheet conveyer, it is automatically shifted laterally upon the conveyer until its registering edge is in contact with the preliminary registering plate or flange, which, it will be understood, is so positioned upon the conveyer frame as to place the sheet within a fractional distance of its final side registered po-

sition, the final registering device being so positioned that it will engage the sheet at the extreme edge and impart to it its final side registering movement.

The employment of coöperating upper and lower registering rollers has been suggested, but the lack of success in the past with this form of registering device has been due mainly, if not entirely, to the fact that the necessity of locating the registering rollers far enough away from the registering gage or face to insure their engagement with the sheets under the wide range of variations of the successive sheets which are operated upon, causes these rollers to sometimes engage the sheet so far from the registering gage that the action of the rollers in registering the sheet (particularly when acting upon thin paper) will crumple or bend the sheet between the gage and the rollers, thereby destroying the registry. This difficulty has been partially overcome by providing automatic trips for such registering rollers, but such automatic trips are incapable of producing the best results where great rapidity of action is required. This objection is overcome in my present invention by providing for the preliminary side registry of the moving sheet, so that the final registering rollers will never engage the sheet more than a small fraction of an inch away from the side registering gage or face so that there is no danger of buckling or crumpling the edge of the sheet between the rollers and gage and the registry is not interfered with. In the operation of my improved mechanism, I am able, by the action of the preliminary registering device, to place the successive sheets so accurately that the final registering device is not required to move the sheets over $\frac{1}{8}$ of an inch, which is of the greatest importance not only in the interest of accuracy, but because of the rapidity of action that is required.

In order that my invention may be fully understood, I will first describe the same with reference to the accompanying drawings, and afterward point out the novelty more particularly in the annexed claims.

In said drawings: Figure 1 is a side elevation of a sheet conveying mechanism having my improvements applied thereto. Fig. 1ª is a detail cross section of the preliminary registering plate or flange. Fig. 2 is a detail plan view of a part of the mechanism shown in Fig. 1. Fig. 3 is an enlarged detail vertical longitudinal sectional view showing an outside elevation of the final registering device. Fig. 4 is a detail plan view of the final registering device. Fig. 5 is a vertical transverse sectional view showing another elevation of this device. Fig. 6 is a detail sectional view illustrating the controlling cam for the final registering device, and Figs. 7 and 8 are respectively a detail plan and detail side elevation of the reversible mechanism for causing the final registering mechanism to recede from the edge of the sheet after the sheet is registered.

Referring first to Figs. 1 and 2 of the drawings, 1 represents a part of the frame of a printing press, 2 a part of the impression cylinder thereof, 3 the press gages, and 4 part of the frame of an automatic paper feeding machine, which press and feeder frames are usually rigidly connected by tie bars, such as shown at 5. The automatic feeding machine may be of any suitable construction since it forms no part of my present invention. The drawings show the under feed shaft 6 of the feeder drop-roller delivery mechanism and the main cam shaft 10 from which all the parts of the feeding machine are usually driven.

The conveyer frame proper comprises suitable longitudinal side bars 15 connected at their ends with corner brackets 16 and 17. The usual transverse tie rods and shafts extend between the side frames and brackets. The brackets 16 are pivotally mounted upon studs upon brackets 32 for pivotally connecting the conveyer to the frame of the paper feeding machine.

Journaled in depending lugs of the forward brackets 17 of the conveyer frame is the idler tape roller 20. The forward detachable section 26 of the conveyer frame is designed to rest upon the press frame 1 and is formed with open sockets 25 in which fit studs 27 projecting laterally from brackets 17, as shown particularly in Fig. 1. This forward section 26 of the conveyer frame supports the final side registering mechanism hereinafter referred to, and the under guide slats upon which the forward part of the sheet rests when in engagement with the press gages 3.

30 is the tape drum journaled in the forwardly projecting brackets 32 of the paper feeding machine. This drum 30 supports and drives the main conveyer tapes 35 which pass around said drum and around the idler roller 20, a series of usual idler pulleys 36 engaging the under lap of the belts for holding them taut. The tape drum 30 is driven from the shaft 6 of the feeding machine through the gears 40, 41 and 42. A gear 45 keyed to the projecting end of the shaft of drum 30 meshes with and drives an intermediate gear 46 which in turn meshes with a gear 47 formed integral with the hub 48 of bevel gear 49 journaled upon a stud of bracket 32. The bevel gear 49 meshes with and drives a similar bevel gear 50 keyed to the rear end of a shaft 51 which extends longitudinally of the conveyer frame and is journaled in bracket arms 52. This shaft 51 is for the purpose of driving an improved slowdown mechanism which forms no part

of my present invention, but which is the subject of an application filed by me the 25th day of August, 1909, Serial No. 514,602.

60 is an idler tape roller extending transversely of the conveyer frame approximately midway between its ends and suitably journaled in the bracket arms 61 secured to the side bars 15 of the conveyer frame.

65 represents a series of short endless conveyer tapes passing around the tape drum 30 and the idler roller 60, and having their conveying surfaces arranged approximately in the same plane as, and between, main conveyer tapes 35. These tapes 65 are twisted as represented in Fig. 2 for the purpose of having a worm action upon the sheets as they are conveyed forwardly by the main conveyer tapes to move the sheets laterally upon the conveyer frame by their travel forwardly.

Projecting inwardly from brackets 70 of the conveyer frame are the rigid rods or bars 71 upon which is adjustably mounted the preliminary registering plate or blade 75 which extends longitudinally of the conveyer frame and limits the lateral movement of the sheet acted upon by the twisted tapes 65. The plate or blade 75 is preferably of angular shape in cross section as shown in Fig. 1ª to effectively confine the register edge of the sheet. This registering plate or blade 75 extends approximately one-half the length of the conveyer frame, it being necessary that the sheet be beyond and free from said registering plate when it reaches the front gages of the press so as to permit the final registering mechanism to act.

While I have shown in the drawings only one registering blade 75, it will of course be understood that I may arrange such a blade upon opposite sides of the conveyer frame, or at least provide two sets of supporting arms 71 to facilitate the transfer of this registering blade from one side of the conveyer to the other. When the registering blade is moved to the opposite side of the conveyer, it will of course be understood that the twisted tapes must be twisted in a reverse direction to shift the sheet laterally to the opposite side. I prefer, however, to always maintain the registering blade 75 on the same side of the conveyer frame for effecting the preliminary positioning of the sheet, no matter which side of the machine the final registering mechanism is operating upon, it being clear that even when the final registering mechanism is on the side of the conveyer frame opposite to the preliminary registering blade 75, the sheet can be given about as accurate a preliminary position although adjusted with relation to the edge which is opposite the final side registry edge. The action of the twisted tapes in combination with the longitudinally extending registering blade is to give the successive sheets moving through the conveyer a preliminary positioning or registry upon the conveyer so as to leave the smallest possible registering movement for the action of the final registering device.

The forward portion 26 of the conveyer frame is formed with bearings for the reception of a laterally extending reciprocatory flat bar 80 upon which the final side registering device is adjustably mounted. 85 is the bottom plate of this final side registering mechanism provided upon its under surface with the yoke 86 which embraces the transverse bar 80. The rear end of the plate 85 has a downwardly inclined lip 85ª which is presented just in front of the idler tape roller 20 for the purpose of guiding the leading edge of an advancing sheet into proper relation with the final registering device.

100 is the under side registering roller, preferably of smooth-faced metal mounted upon a short shaft 101 extending parallel with the travel of the sheets and journaled in bearings 102 projecting beneath the plate 85. This under roller is mounted with its upper periphery in the plane of feed. The shaft of this lower roller 100 has keyed to it the small worm gear 101ª meshing with a similar worm gear 103 keyed to the lower end of a short vertical shaft 104 suitably journaled in an upright bracket arm or bearing 105. This bracket arm 105 projects from a plate 106 secured to the bottom plate 85 by means of bolts 107. The upper end of the vertical shaft 104 has keyed to it a worm gear 110 meshing with a similar worm gear 111 carried by the end of a short shaft 112 freely journaled in the bracket 113 supported upon the plate 106. This shaft 112 is formed with a socketed end at 112ª to receive a short shaft section 115 of a universal joint coupling 116 of a driving shaft 117. A set screw 118 secures the coupling shaft section 115 in the socket of short shaft 112.

120 is an inwardly and rearwardly projecting curved guide plate mounted upon the bracket arm 113 to assist in guiding the leading edge of the sheet at the registry side into position with relation to the final registry device.

Shaft 112 carries a cam 125 having a low portion 125ª. Arranged between the cam 125 and one of the bracket bearings 113 is a vertically movable frame 130 having in its vertical arm an elongated slot 131 through which the shaft 112 extends, said slot permitting the frame 130 to be moved freely upwardly and downwardly. An anti-friction roller 132 is journaled at 133 in the upper end of frame 130 and runs in peripheral contact with the cam 125 by which the frame 130 is operated. The lower end of the frame 130 is of yoke-shape to receive the upper rubber-faced registering roller 140,

which is mounted upon a short shaft 141 freely journaled in the two arms 134 and 135 of the yoke-shaped lower end of frame 130. The frame 130 supports the roller 140 in the same vertical transverse plane as the lower roller 100 and in peripheral contact therewith (or with the sheet between them) when roller 140 is in lowered position. The lower yoke-shaped portion of frame 130 is formed with two sheet guiding arms or shoes 134^a and 135^a which are presented parallel with the upper face of the plate 85 and have upwardly turned inner ends. When this frame, carrying roller 140, is in lowered position, the guide fingers or shoes 134^a and 135^a are presented very close to the surface of plate 85 upon opposite sides of the roller 140, so as to effectively confine the sheet within close limits at the point of registry.

Projecting upwardly from the yoke portion of frame 130 is a lug 145 to which is pivoted at 146 a lever 147 journaled to the vertical bracket arm 105 at 148. A spring actuated rod 150 is pivoted to the outer end of lever 147 at 151 and passes freely through a guide lug 152 and supports an expansion spring 153 which is confined upon the rod 150 between the lug 152 and an adjustable collar 154 upon said rod. The purpose of the spring 153 acting upon lever 147 as just explained, is to press the rubber-faced registering roller 140 against the lower positively driven roller 100 and to cause the anti-friction roller 132 to follow the controlling cam 125 in the registering operation.

The shaft 117 may be driven in any suitable manner, and as shown in the drawings is driven through a universal joint coupling 160 with a short forwardly projecting shaft 161 journaled in a bracket 162 hung from cam shaft 10 and having worm gear connection 163—164 with said cam shaft. It will be observed from Figs. 1 and 2 of the drawings that the driving shaft 117 is extended from the center of the cam shaft 10 to the side of the conveyer frame where it is coupled with the final registering device. The shaft connection being removable, it will be understood that a final registering device at either side of the conveyer may be coupled up and operated. With driving connection for shaft 117 geared to the cam shaft of the feeding machine, the final registering device comes to a stop when the feeder clutch is thrown out with the result that a sheet at the press gages upon the conveyer will not be registered and will be taken into the press unless the press is also stopped. For this reason it is sometimes desirable to gear the shaft 117 to the driving train of the feeder outside of the feeder clutch, or to the press, so as to insure the final registry of a sheet which reaches the press gages after the feeder is stopped.

155 is the vertical registering face or gage formed upon the plate 106 parallel with the direction of travel of the sheets. A yoke or collar 175 is adjustably secured to the bar 80 and formed with an upright ear or lug 176 through which projects an adjusting screw 177 rigidly connected with a lug 178 upon the plate 106. Thumb nuts 179 and 180 are threaded upon the screw 177 upon opposite sides of the ear or lug 176 for the purpose of adjusting to a nicety the registering device just described.

It will be understood that the yoke or collar 175 which is adjustably clamped to the bar 80 of the final registering mechanism secures the registering device to its supporting bar, the registering device proper being freely adjustable upon the bar transversely of the conveyer. In positioning the registering device for a particular piece of work, the yoke or collar 175 is loosened and the whole device shifted upon the bar to approximately correct position, when the yoke or collar 175 is secured to the bar and by manipulating the thumb nuts 179 and 180, the gage face 155 of the registering device is accurately adjusted to the exact point desired.

Immediately after the registry of a sheet at the front gages of the press, it is desirable to cause the side registering gage 155 to recede or move away from the registered sheet so as to avoid the possibility of injuring the sheet as it is pulled off of the conveyer frame by the cylinder grippers and also to avoid the wearing action upon the gage. For this purpose the bar 80 of the final registering mechanism is mounted to move intermittently transversely of the conveyer frame, its movement outwardly taking place immediately after the final registry of a sheet, and inwardly just prior to the final registering action. To effect these movements of the supporting bar 80, I have devised a reversible operating mechanism which will now be described.

200 is a yoke clamped upon the bar 80 just outside of the conveyer frame. This yoke 200 is formed with U-shaped sockets or recesses 201 in its opposite ends.

Journaled in a bracket 202 extending outwardly from a part of the conveyer frame is a short vertical shaft 203 which carries upon its opposite end a double-armed rocker lever 204 having vertical openings in its opposite ends.

205 is a stud or bolt which is removably secured in one of the openings in the ends of the rocker lever 204. This bolt or stud 205 may be threaded into the opening in the rocker lever or it may be secured by a nut or by a securing pin. An anti-friction roller 206 is freely journaled upon the end of the bolt or stud 205 and is adapted to engage the U-shaped socket or recess 201 at

either end of the yoke 200. The short vertical shaft 203 has secured to its lower end a rock arm 208 carrying in its free end an anti-friction roller 209 which operates in engagement with a cam plate 210 mounted upon the longitudinally movable bar 211 which is supported in bearings 212 secured to the press frame 1. A spring (not shown) retains the bar 80 in its inner normal position, thereby holding the anti-friction roller 209 in working engagement with the cam plate 210. The reciprocating bar 211 is operated by a pitman 213 extending back to the feeding machine and connected with a cam actuated lever which is not shown. This reciprocating bar 211 is the throw-out actuating bar for the Dexter automatic press feeder as now constructed, operating upon the principle set forth in Patent No. 772,705 granted to me October 18th, 1904. From this construction, it will be observed that the reciprocation of the bar 211 causes the side registering mechanism to be intermittently moved outwardly and inwardly upon the conveyer frame.

The feature of providing a removable connecting stud or bolt between the double-armed rocker lever and the yoke of the reciprocating bar of the registering mechanism is important as a simple and convenient means for operating the final registering mechanism as a right hand or left hand registering device. When the registering mechanism is arranged at the right hand of the conveyer as shown in the drawings, the coupling stud or bolt connects the rearwardly projecting arms of the yoke 200 and rocker lever 204, whereas, in the case of operating the final registering mechanism at the left hand side of the conveyer, the coupling stud or bolt would connect the forwardly projecting arms of the yoke 200 and rocker lever 204, with the result that in either case the side registering gage will be moved away from the edge of the sheet immediately after the sheet is registered, and will be moved into registering position just before the final registry of a sheet.

It will be understood that I may provide a final registering mechanism at both sides of the conveyer frame, or I may depend upon the removability of the registering mechanism which enables me to shift the final registering mechanism from one side of the conveyer to the other.

The operation of the mechanism as a whole will be clear from the above description with but few words of explanation. The sheets are fed from the automatic feeding machine by the drop roller delivery mechanism to the sheet conveyer which rapidly carries the successive sheets forwardly to the press gages. As each sheet moves forwardly upon the conveyer, the twisted tapes shift it laterally into engagement with the preliminary registering plate or blade 75, which has previously been accurately adjusted to insure the registry edge of the sheet to be presented to the final registering mechanism within a small fraction of an inch of final registering position. Immediately after the arrest of the sheet by the press gages, the upper registering roller is lowered to press the sheet against the constantly driven under roller with the result that the edge of the sheet engaged by the said coöperating rapidly running rollers will be instantly shifted laterally until its registering edge engages the registering face or gage 155. This final registering action is extremely rapid, not only because of the short registering movement required, but also because of the rapid motion of the registering rollers. The rollers engage the sheet very close to the registering edge so that the danger of buckling the edge of the sheet between the bight of the rollers and the registering gage is reduced to a minimum. Furthermore, the sheet is closely confined between the plate 85 and the guide fingers 134^a and 135^a of the vertically movable frame 130. Immediately after the final registry of the sheet, the press gages are raised and the cylinder grippers take the sheet and draw it off from the conveyer frame.

The main feature of importance in my present invention is the provision of the two sheet registering mechanisms, one effecting an accurate preliminary positioning of the sheet while it is moving forwardly upon the conveyer frame, and the other imparting a slight final registering movement to the sheet after it comes to rest in engagement with the press gages.

I am aware that it is not new to employ twisted conveyer tapes for imparting the side registering movement to a sheet, and I am also aware that it is not new to employ two coöperating rollers for registering the sheet, but so far as I am aware, it has never been proposed to provide a rapid and accurate sheet registering mechanism for printing presses, comprising a preliminary sheet registering or positioning device acting upon the sheets while they are in motion, in combination with a final registering device which comes into action after the preliminarily registered sheet has come to a state of rest at the press gages.

What I claim is:—

1. The combination in a sheet conveying machine, of the preliminary and final side registering devices arranged progressively in the path of sheets, said preliminary side registering device comprising means for imparting a sidewise movement to a sheet while it is traveling to place the sheet within the range of action of said final side registering device, and said final side register-

ing device comprising a side gaging member and a laterally acting sheet moving member to accurately complete the side registering operation.

2. The combination in a sheet conveying machine, of the preliminary and final side registering devices arranged progressively in the path of sheets, and front gages for arresting the travel of sheets, said preliminary side registering device comprising a preliminary side registering gage and means for imparting a preliminary sidewise adjustment of a sheet while it is traveling to place the sheet within the range of action of said final side registering device, and said final side registering device comprising an independent side gaging member and an independent laterally acting sheet moving member adapted to accurately complete the side registering operation after the sheet is arrested by said front gages.

3. The combination with a sheet conveyer, of the preliminary and final side registering devices arranged progressively in the path of sheets, said preliminary registering device being adapted to shift the sheet laterally, as it travels through said conveyer to place it within the range of action of said final registering device, and said final registering device comprising a rotary sheet engaging member and a gage member.

4. The combination with a sheet conveyer, of means for shifting the sheet laterally as it travels through said conveyer, a preliminary side registering gage adapted to limit the lateral movement of the traveling sheets, front gages for arresting the forward travel of sheets, a final side registering gage, and a rotary final registering device adapted to act upon a sheet after it has been arrested by said front gage to move it into final registered position against said final side registering gage.

5. The combination with a sheet conveyer having main sheet conveying tapes, and auxiliary twisted tapes for shifting a sheet laterally as it travels through said conveyer, means for limiting the lateral movement of the traveling sheets, front gages for arresting the travel of the sheets, and a final registering device acting upon the sheet after it is arrested by the gages, and comprising an independent side gaging member and coöperating laterally acting sheet moving member, substantially as set forth.

6. The combination of a sheet conveyer, of twisted tapes arranged upon the conveyer and adapted to shift the sheet laterally as it travels through said conveyer, a preliminary side registering gage adapted to limit the lateral movement of the traveling sheet, front gages for arresting the forward travel of the sheets, a final side registering gage, and a rotary side registering device coöperating with said final side registering gage and arranged to act upon the sheets after they are arrested by said front gages.

7. In a conveyer, the combination of the main sheet conveying tapes, a preliminary registering plate, auxiliary twisted tapes arranged between and of less length than said main tapes for shifting the sheet laterally while it is moving, and a final registering device adapted to finally position the sheet after its movement has been stopped.

8. In a conveyer, the combination of the main sheet conveying tapes, gages for arresting sheets, auxiliary twisted tapes arranged between said main conveying tapes, a registering plate arranged at one side of, and extending longitudinally with relation to the conveyer for limiting the lateral movement of sheets acted upon by said auxiliary twisted tapes, and a final side registering device adapted to act upon the sheets after they are arrested by said gages.

9. In a conveyer, the combination of the main sheet conveying tapes, gages for arresting sheets, auxiliary twisted tapes arranged between said main conveying tapes, a registering plate arranged at one side of, and extending longitudinally with relation to the conveyer for limiting the lateral movement of sheets acted upon by said auxiliary twisted tapes, and a final registering device at one side of the conveyer adapted to act upon the sheets after they are arrested by said gages and comprising intermittently operating rollers between which the sheets are passed.

10. The combination of a printing press having sheet gages, an automatic paper feeding machine, and a sheet conveyer arranged to transfer sheets from the feeding machine to the gages of the printing press, said conveyer including main conveying tapes, and auxiliary twisted tapes arranged between and of less length than the main conveying tapes, a registering plate arranged at one side of the conveyer parallel with the direction of travel of the sheets, and a final registering device adapted to act upon the sheets after their movement has been arrested by the front gages of the press.

11. The combination of a printing press having sheet gages, an automatic paper feeding machine, and a sheet conveyer arranged to transfer sheets from the feeding machine to the gages of the printing press, said conveyer including main conveying tapes extending approximately the whole distance between the feeding machine and press, and auxiliary twisted tapes arranged between the main conveying tapes and extending approximately one-half the distance between the feeding machine and press, a registering plate arranged at one side of the conveyer parallel with the direction of travel of the sheets, and an intermittently operating final registering device adapted to act upon the

sheets after their movement has been arrested by the front gages of the press.

12. The combination of a printing press having sheet gages, an automatic paper feeding machine, and a sheet conveyer arranged to transfer sheets from the feeding machine to the gages of the printing press, said conveyer including main conveying tapes and auxiliary twisted tapes arranged between and of less length than the main conveying tapes, a registering plate arranged at one side of the conveyer parallel with the direction of travel of the sheets, and of approximately the same extent lengthwise of the conveyer as said twisted tapes, and a final registering device adapted to act upon the sheets after their movement has been arrested by the gages of the press.

13. In a sheet conveyer, the combination of the main conveying tapes, a bar movable transversely of said conveyer, a side registering mechanism mounted upon said bar at one side of said conveyer, a yoke secured to said bar, a rocker lever, a shaft upon which said rocker lever is mounted, means for rocking said shaft, and a removable pin or bolt adapted to connect said rock arm with either end of said yoke.

14. In a sheet conveyer, the combination of the main conveying tapes, a bar movable transversely of said conveyer, a side registering mechanism mounted upon said bar at one side of said conveyer, a yoke secured to said bar and formed with sockets or recesses in its opposite ends, a rocker lever, a shaft upon which said rocker lever is mounted, a rock arm upon said shaft, a reciprocating cam engaging said rock arm, and a removable pin or bolt adapted to connect said rock arm with either end of said yoke.

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Witnesses:
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