No. 656,838. Patented Aug. 28, 1900.

T. C. DEXTER.

PAPER FEEDING MACHINE.

(Application filed Sept. 21, 1899.)

(No Model.) 13 Sheets—Sheet 1.

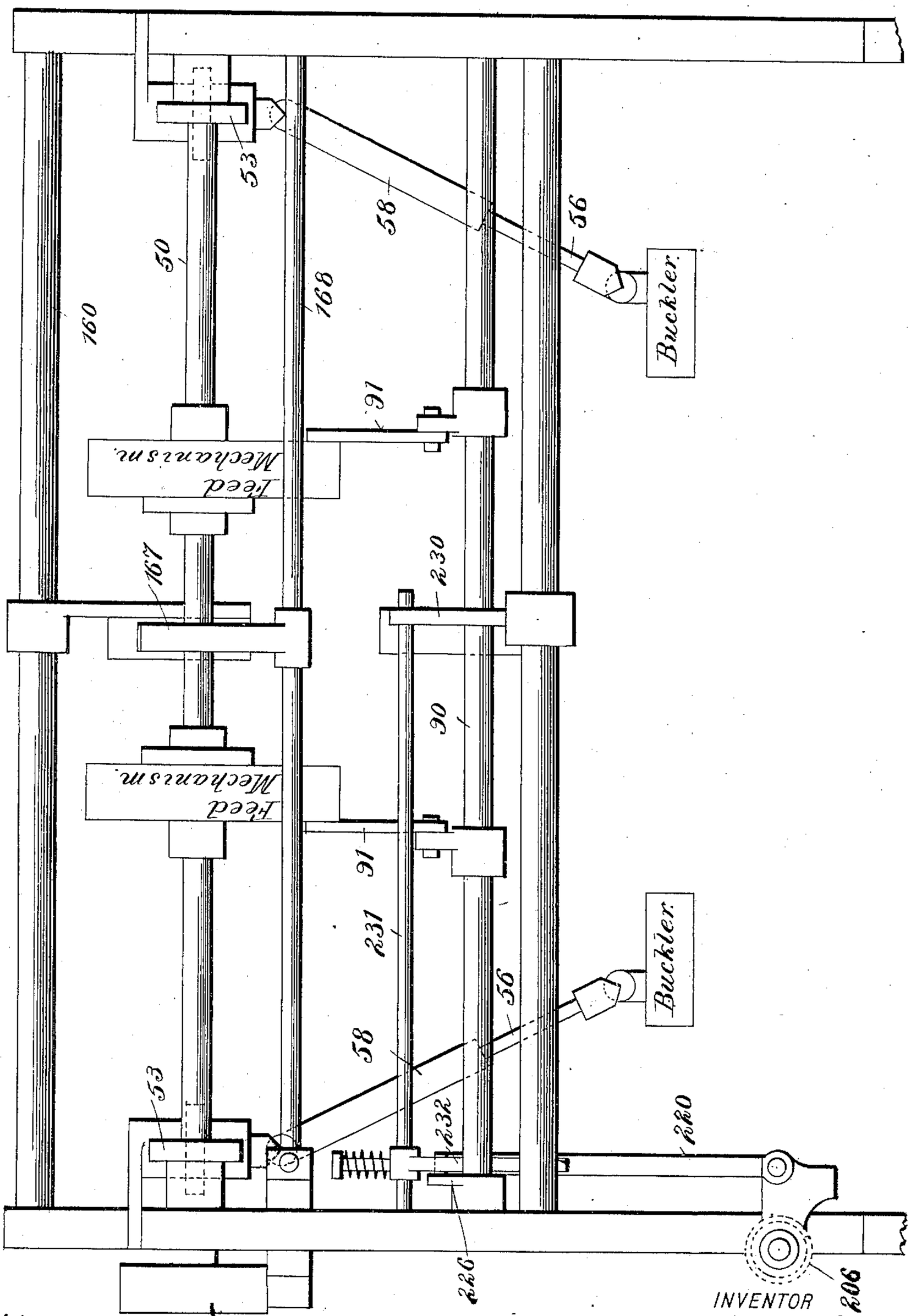

Fig. 1.

Witnesses.
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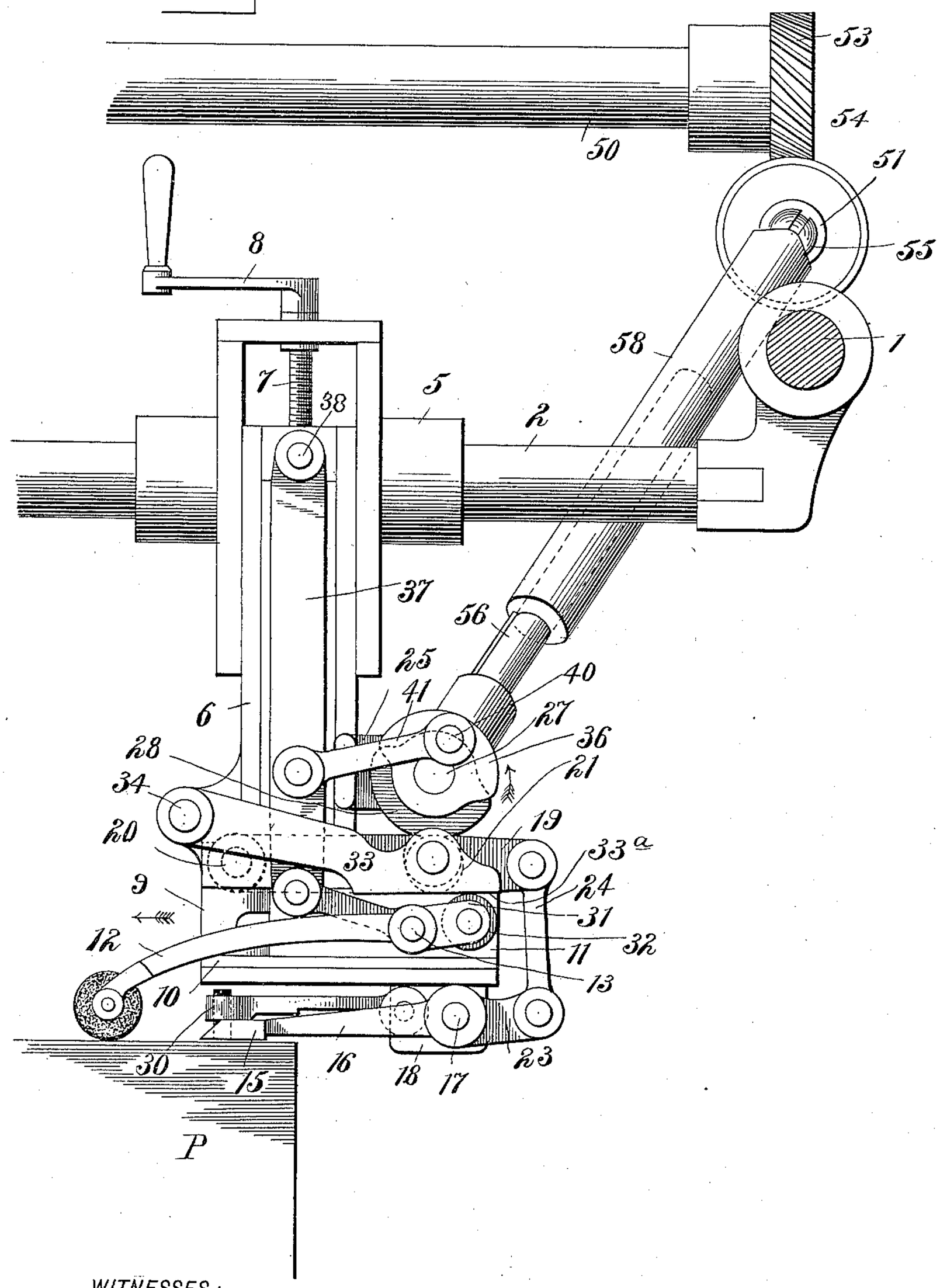
Fig. 2.



WITNESSES:

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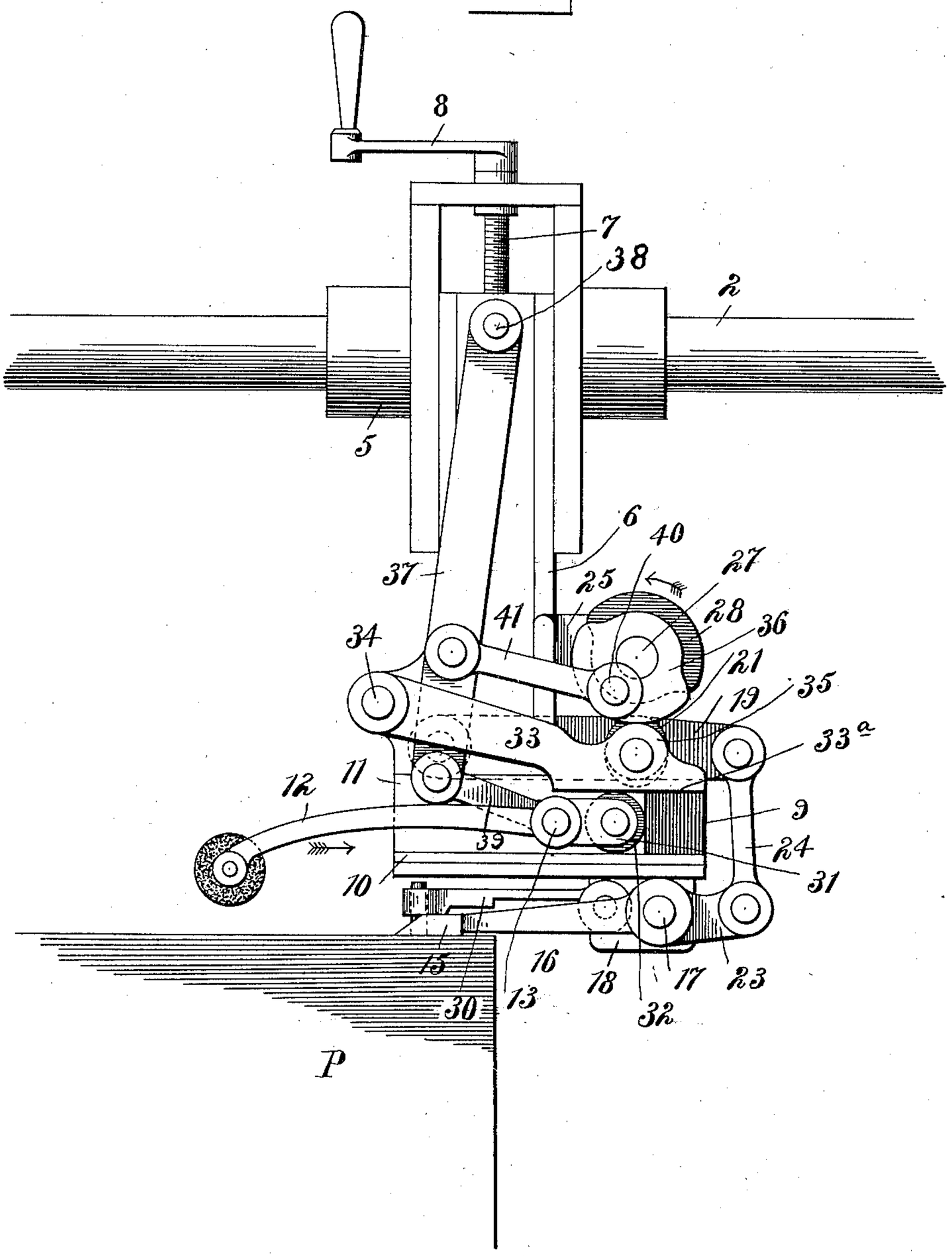
(No Model.) 13 Sheets—Sheet 3.

Fig. 3.



WITNESSES:

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(No Model.) 13 Sheets—Sheet 4.

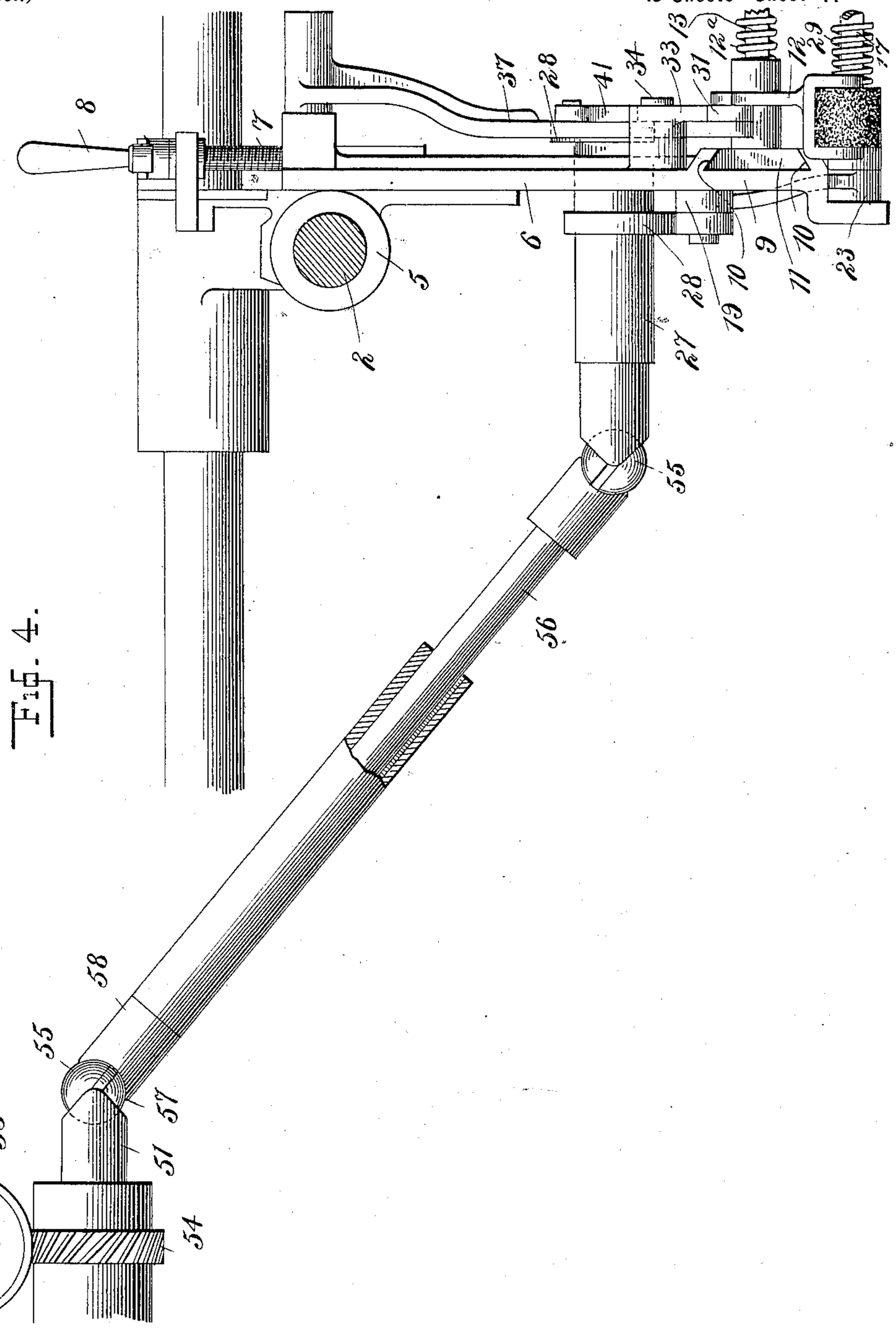

FIG. 4.

WITNESSES:

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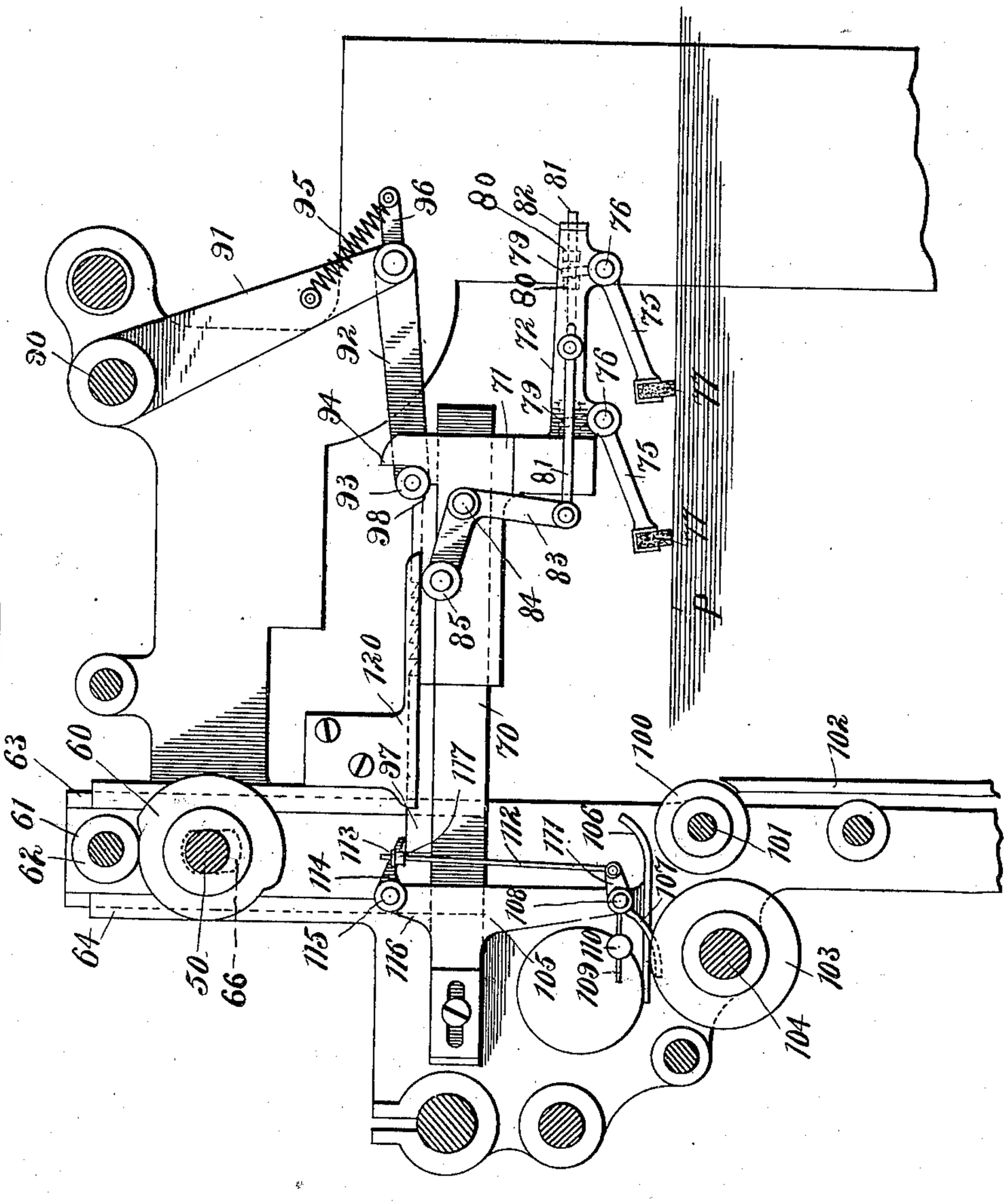
(No Model.) 13 Sheets—Sheet 5.

FIG. 5.



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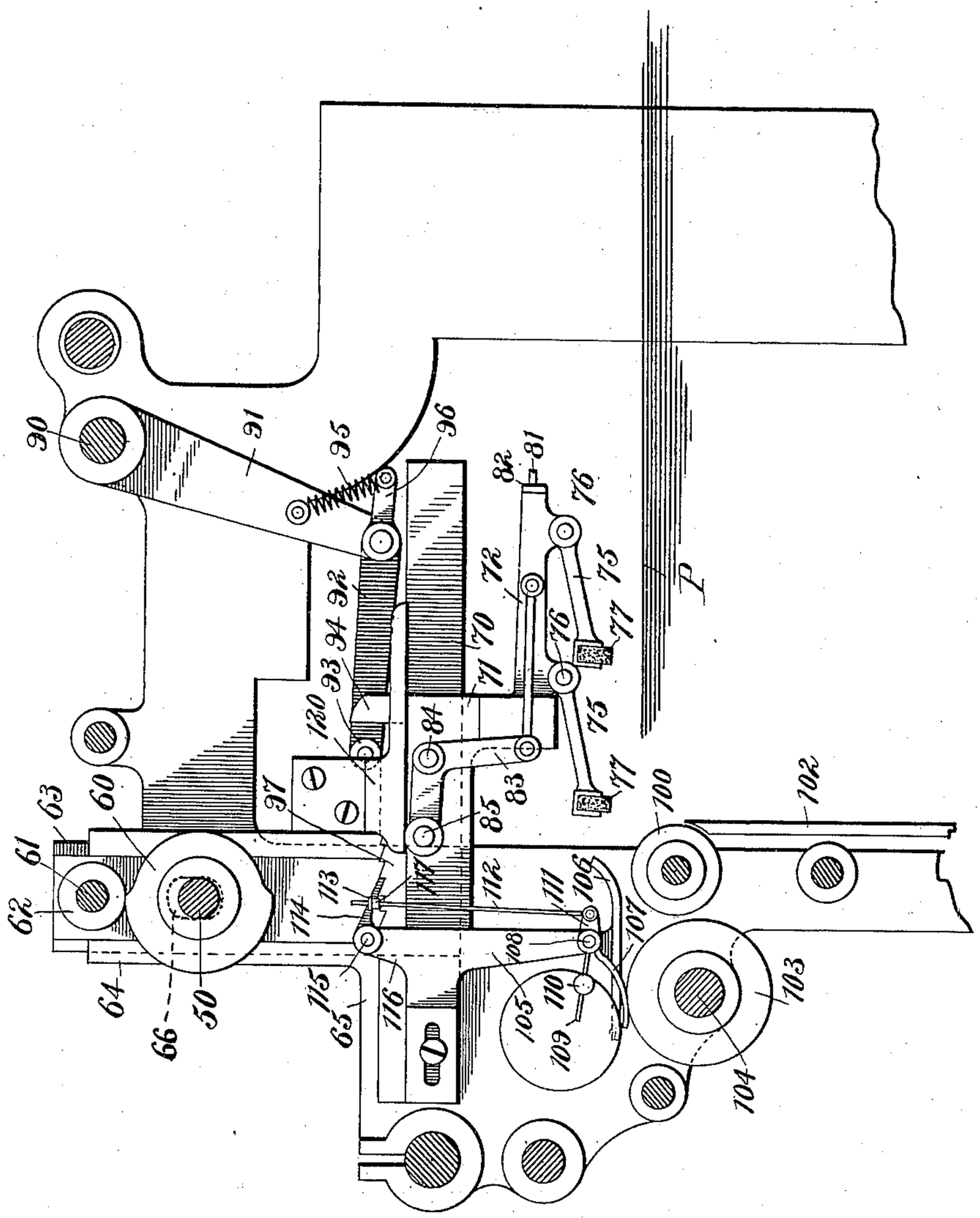
(No Model.) 13 Sheets—Sheet 6.

FIG. 6.



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(No Model.) 13 Sheets—Sheet 7.

FIG. 7.

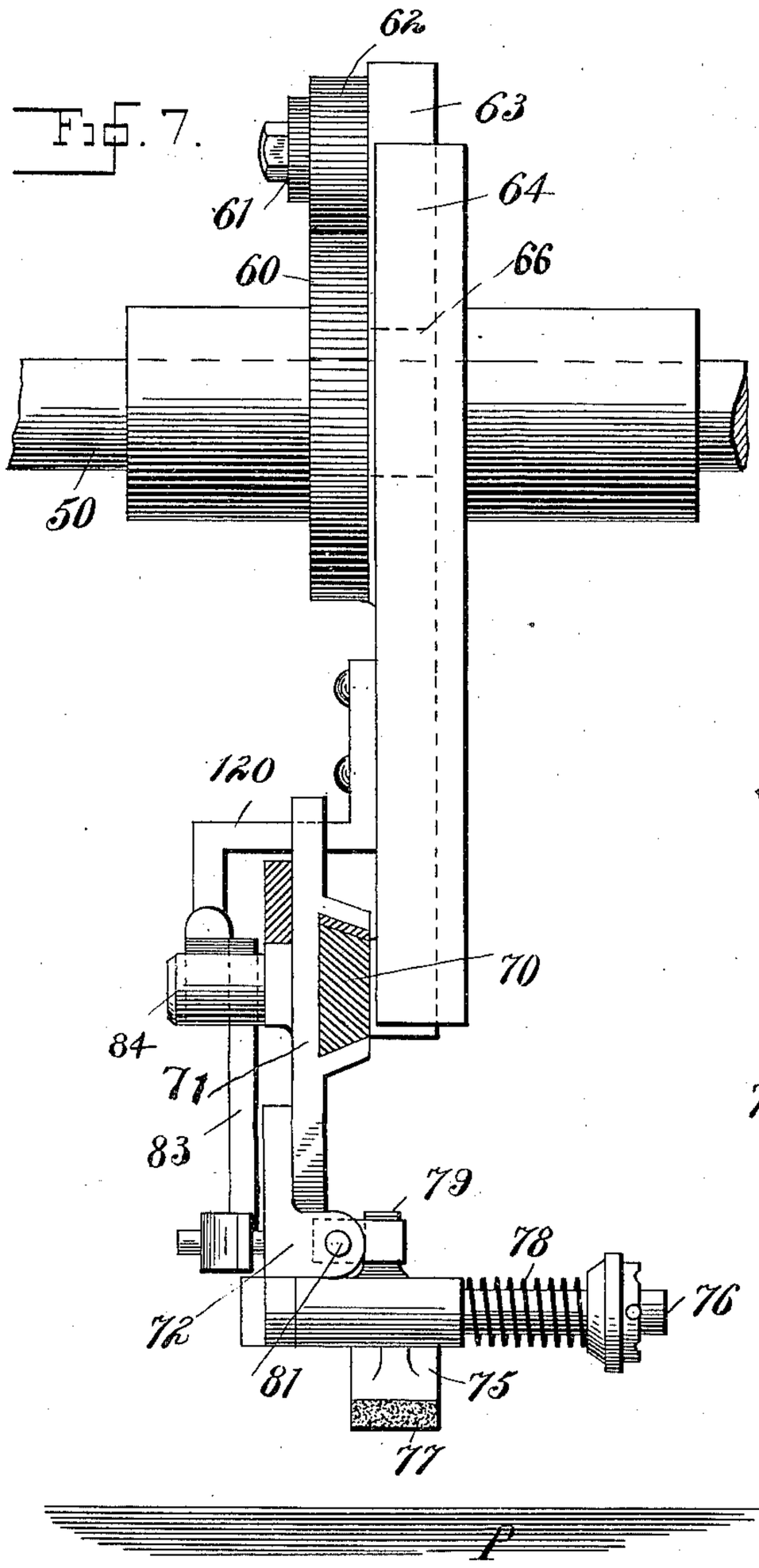
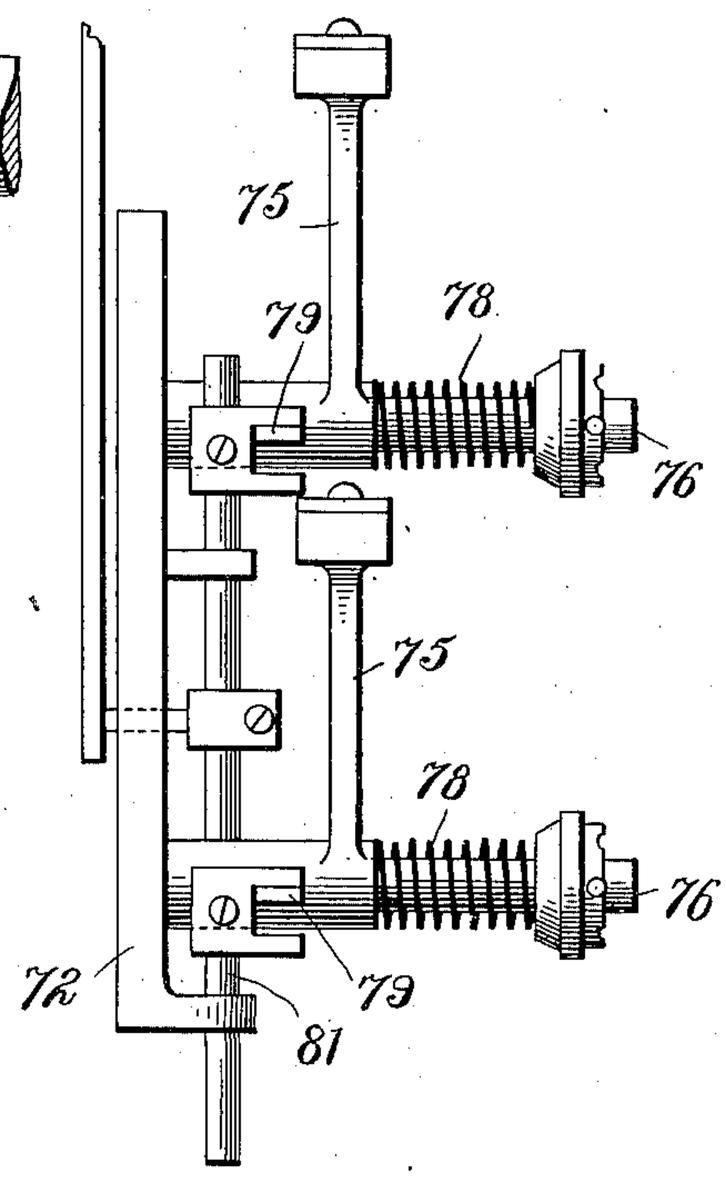


FIG. 8.



WITNESSES:

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(No Model.) 13 Sheets—Sheet 8.

Fig. 9.

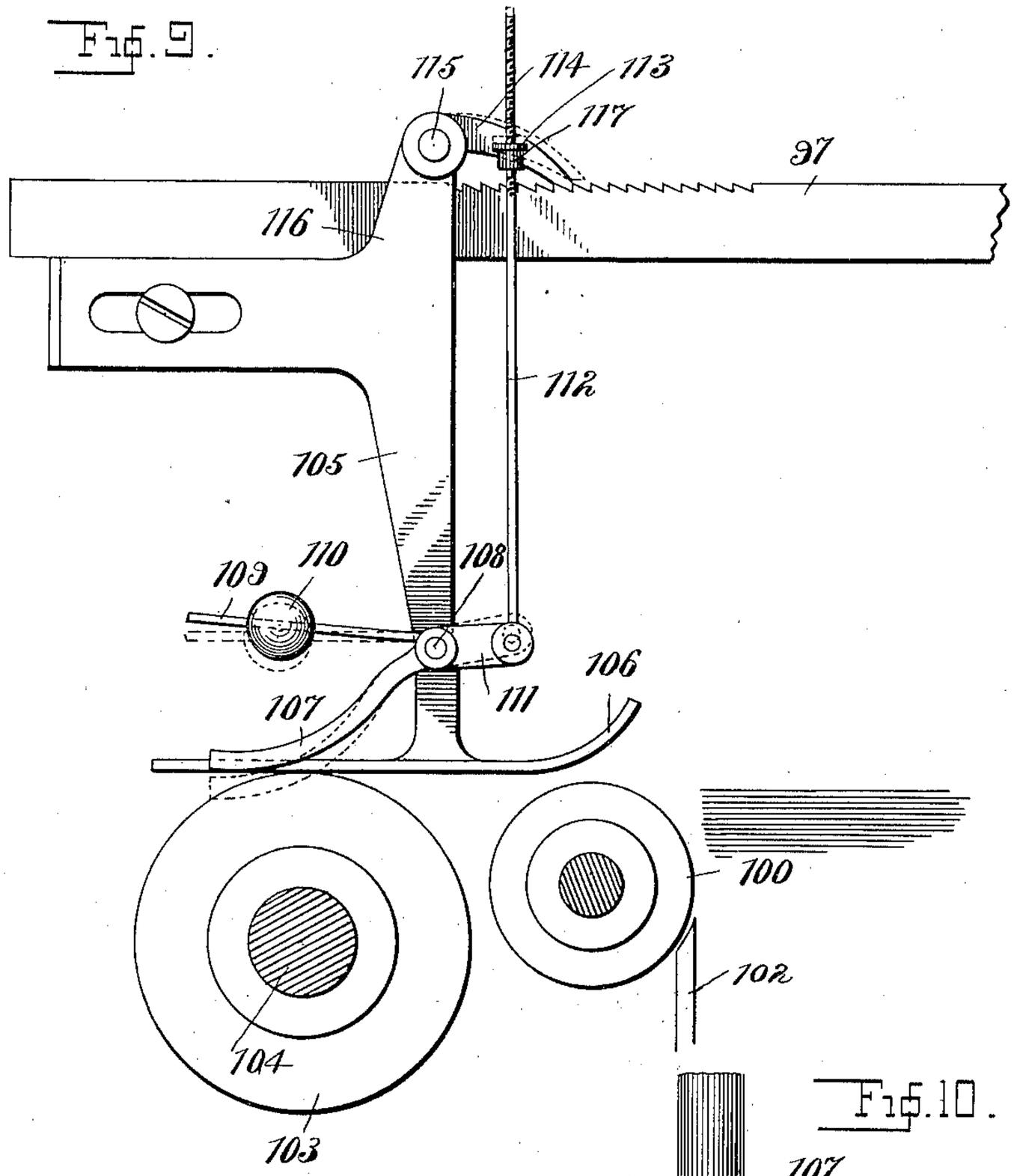


Fig. 10.

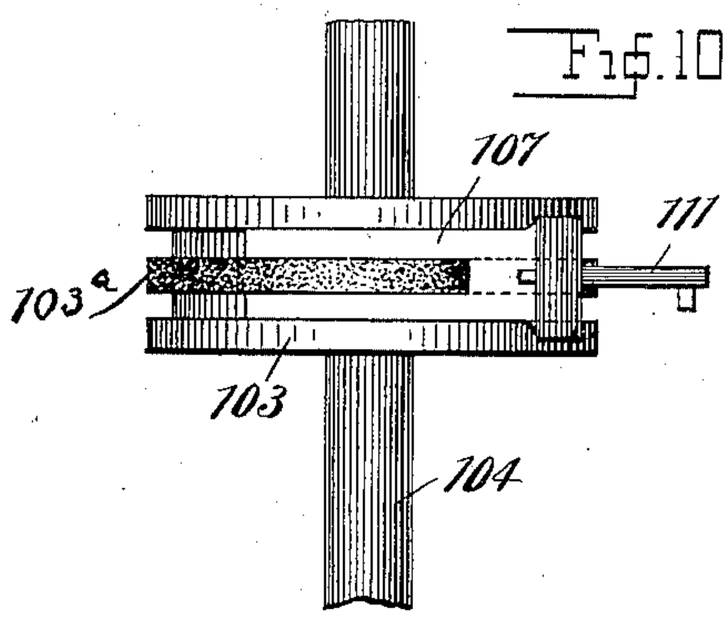
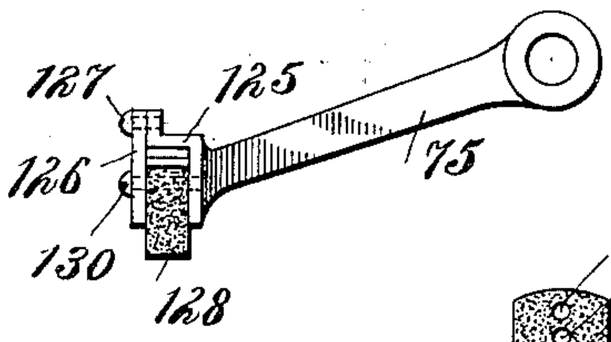


Fig. 11.



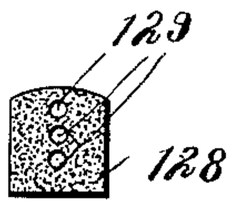


Fig. 12.

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(Application filed Sept. 21, 1899.)

(No Model.) 13 Sheets—Sheet 9.

Fig. 13.

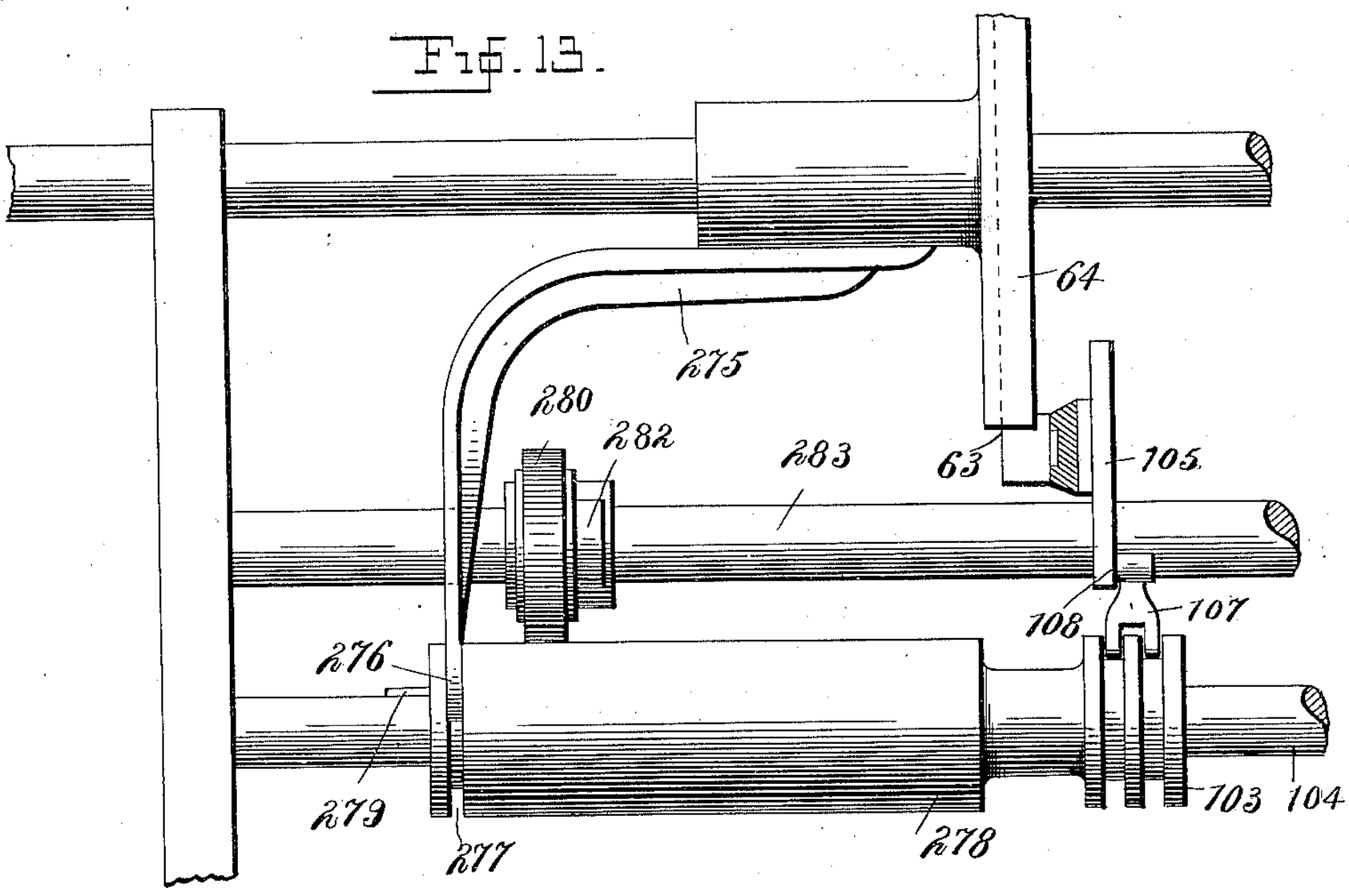
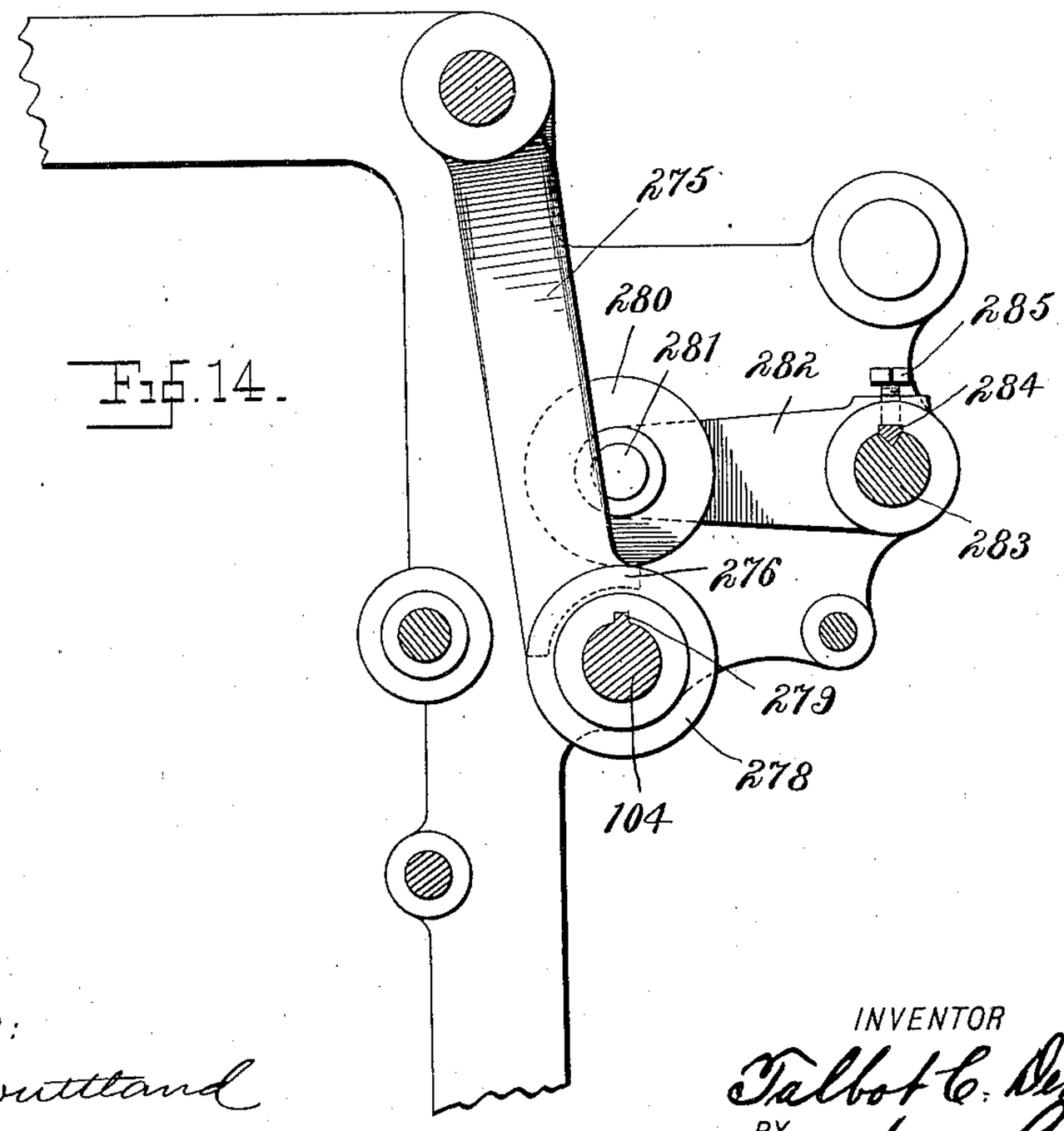


Fig. 14.



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(No Model.) 13 Sheets—Sheet 10.

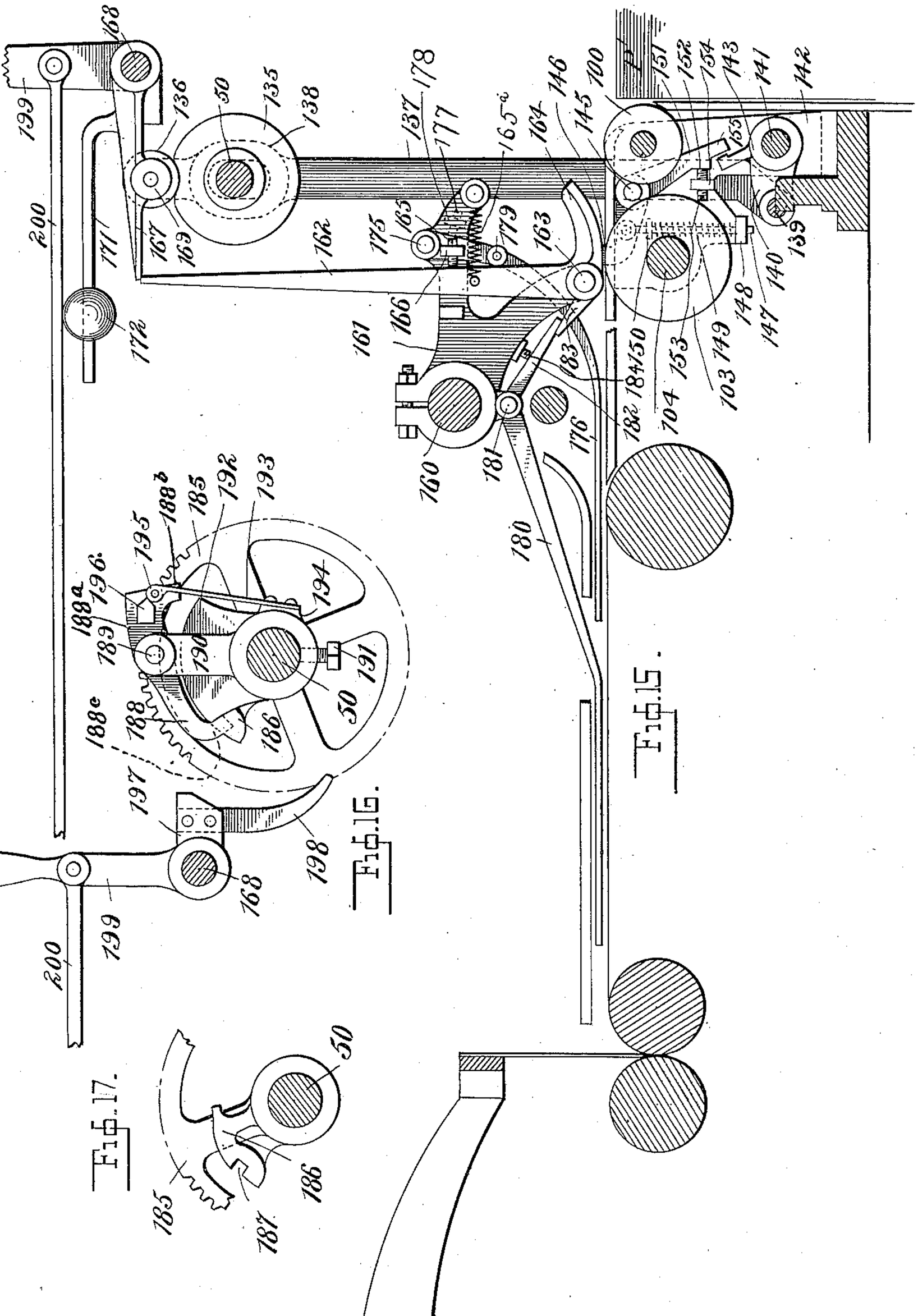

FIG. 15.

FIG. 16.

FIG. 17.

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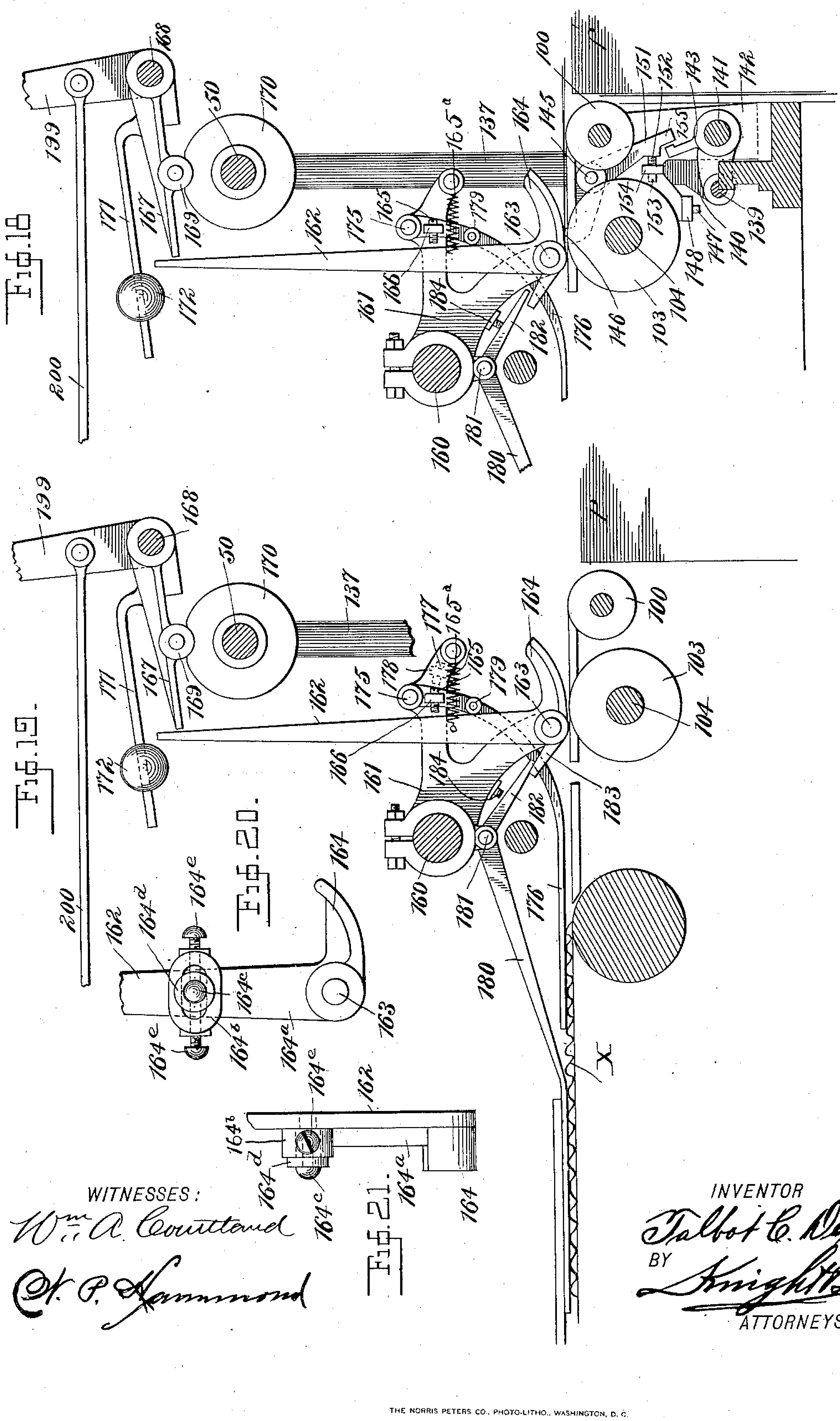
T. C. DEXTER.

PAPER FEEDING MACHINE.

(Application filed Sept. 21, 1899.)

(No Model.) 13 Sheets—Sheet 11.



WITNESSES:

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(Application filed Sept. 21, 1899.)

(No Model.) 13 Sheets—Sheet 12.

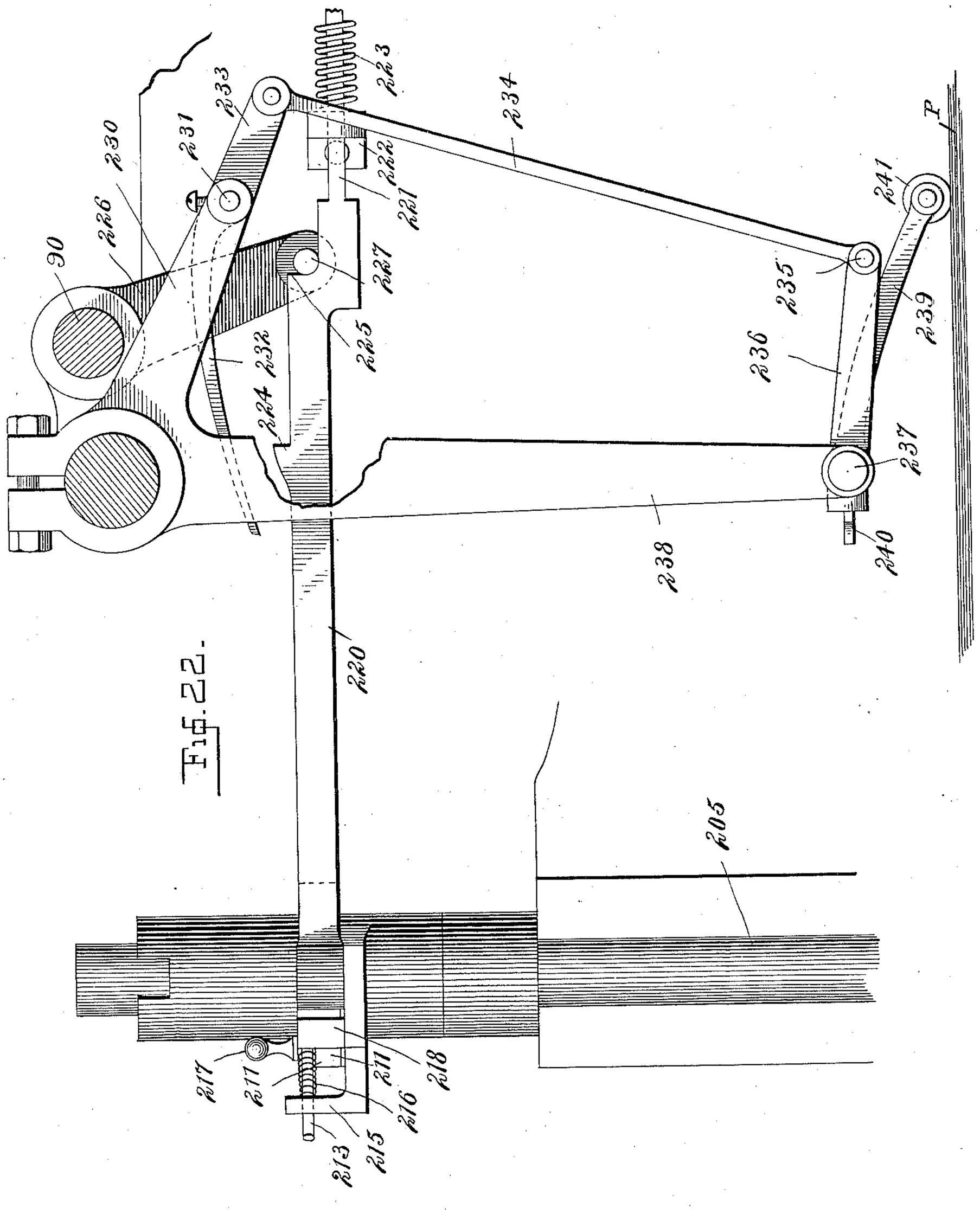

FIG. 22.

WITNESSES:

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PAPER FEEDING MACHINE.

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(No Model.) 13 Sheets—Sheet 13.

Fig. 23.

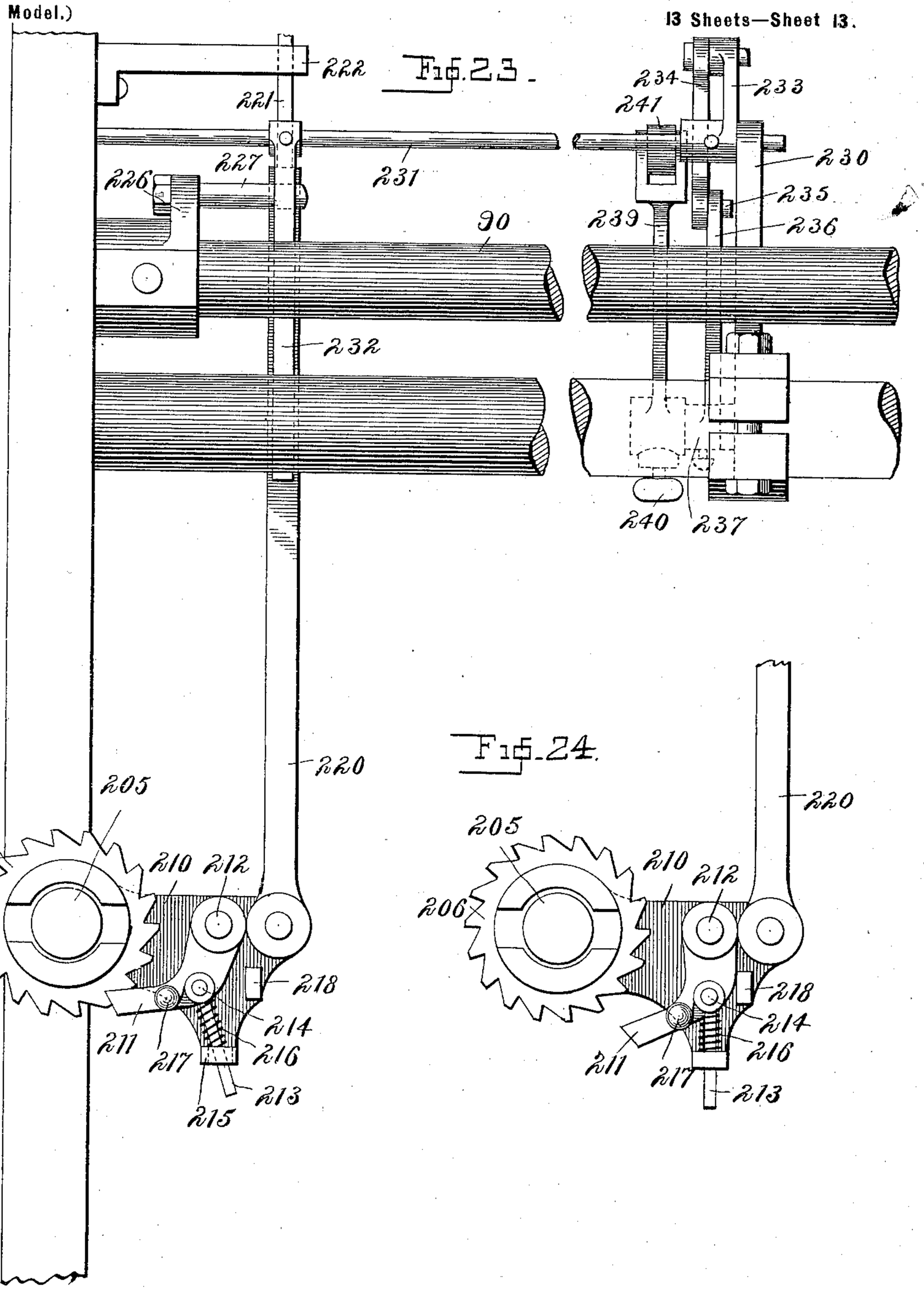

Fig. 24.

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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 656,838, dated August 28, 1900.

Application filed September 21, 1899. Serial No. 731,203. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen of the United States, residing at Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Paper-Feeding Machines, of which the following is a specification.

My invention relates to improvements in paper-feeding machines of the sheet-buckling type, in which the successive sheets of paper in an automatically-adjustable pile are buckled and separated from the pile and then fed off from the pile to the printing-press, paper-folding machine, ruling-machine, or other machine designed to operate upon the paper. Examples of this type of paper-feeding machine which my present machine resembles in general construction are found in Patents Nos. 623,769 and 623,770, granted to me April 25, 1899, and my present invention may be considered as an improvement upon the style of machine shown in said patents, my object being to improve and simplify the structure and operation of the essential parts of such machines.

My invention relates, first, to a simplified form of sheet-buckling mechanism. The improved sheet-buckling mechanism has the usual holding-down finger and buckling-finger mounted upon an adjustably-supported frame, but differs from former devices in the employment of a novel form of controlling device for the buckling-finger and novel automatically-adjustable buckler-operating mechanism. The controlling device for the buckling-finger consists of a cam-operated lever, which is forced into engagement with an anti-friction-roller journaled upon the heel of the buckling-finger when the buckling-finger is moving rearwardly to hold the finger away from the pile. When the buckling-finger moves forwardly, its spring holds it into effective engagement with the pile. The buckler-operating mechanism comprises, essentially, a sectional telescoping shaft, the sections of which have universal-joint connection with a driving-shaft and a driven shaft, respectively, the driving-shaft being geared to and operated by the main power-shaft of the machine, while the driven shaft is journaled upon the buckler-supporting frame and directly operates the buckler mechanism. By the employment of this automatically-adjustable buckler-operating mechanism the buckler mechanism can be quickly adjusted longitudinally, laterally, or vertically with respect to the pile without regard to the operating mechanism, the parts of which automatically adjust themselves to suit the adjusted position of the buckler.

My invention relates, secondly, to a simplified and improved form of automatically-controlled sheet-feeding mechanism. This mechanism comprises a reciprocating carriage, upon which are mounted the usual spring-pressed push-fingers, an operating device adapted to be automatically disengaged from the carriage, a sheet-actuated tripper controlling the disengagement of the operating device from the carriage, means for elevating and lowering the sheet-feeding carriage, and a stationary bar or frame-piece which is adapted to engage a controlling-lever connected with the push-fingers when the carriage is elevated to cause the fingers to be elevated upon the carriage simultaneously with the elevation of the carriage in the frame of the feeding-machine. This part of my invention differs from the feeding-off devices covered by my prior patents in that the carriages and push-fingers are elevated as a whole after the completion of the forward stroke, whereas in the former devices the push-fingers were elevated from the sheet by the operation of a longitudinally-movable controlling-bar upon the carriage, said movable bar being controlled by the sheet-actuated tripper and the carriage being in some cases subsequently elevated and in other cases allowed to remain in one plane above the pile. The objections to the devices formerly used are, first, that it requires a great deal of power to shift the bar, owing to the tension-springs of the push-fingers, and causes the jarring of the carriage and consequent inaccuracy in the operation of the feeding devices, and, second, that when the push-fingers at one side of the sheet are tripped and elevated by the arrival of the front edge of that side of the sheet in registered position the pressure of the push-fingers at the opposite side of the sheet is sometimes sufficient to advance the sheet bodily,

owing to the fact that the push-fingers at the registered side of the sheet have been elevated and there is nothing to retard said first-registered side of the sheet. By the new arrangement of feeding devices the push-fingers of both carriages remain in contact with the sheet until the carriages are simultaneously elevated from the paper, the fingers being at the same time elevated upon the carriage by the engagement of the stationary bar with the controlling-lever. I also employ a novel form of push-finger in which the block of rubber is yieldingly mounted upon the finger and automatically adjusts itself to the surface of the pile.

My invention relates, thirdly, to means for simultaneously adjusting the feeding-off mechanism and tripping mechanism transversely of the pile. This part of my invention comprises a suitable device for connecting these parts without interfering with their operation.

My invention relates, fourthly, to an improved sheet-calipering mechanism, which differs from the calipering device covered by my above-named Patent No. 623,770 in that it is mechanical throughout. The principle upon which this novel mechanical calipering device operates is broadly the same as the device covered by said patent and is clearly within the scope of the claims of said patent, the novel features of construction only being claimed in the present case. I also provide in connection with the calipering device means for arresting the operation of the machine by the action of a rumpled sheet.

My invention relates, fifthly, to certain features of construction in a governing device adapted to regulate the height of a pile of sheets.

My invention relates, further, to certain details of construction of the various parts of the machine, which will first be described with reference to the accompanying drawings and afterward pointed out more particularly in the annexed claims.

The machine covered by my present case differs from the general style of machines covered by my above-named patents in that the sheet-separator at the delivery end of the machine is omitted in the present case.

I have found that the several parts of my present machine operate with such accuracy that the separating device of the former machine is unnecessary, the improved mechanical calipering device being sufficiently accurate to correct any errors of the feeding devices by arresting the operation of the machine when more than one sheet happens to pass forward under the action of the feeding devices or when a sheet is rumpled or otherwise improperly fed from the machine.

In the drawings, Figure 1 is a diagrammatic plan view of my improved paper-feeding machine, showing the relative positions of the several parts. Fig. 2 is a detail rear elevation of one of the improved sheet-buckling mechanisms, showing the buckling-finger starting on its inward or active stroke. Fig. 3 is a view similar to Fig. 2, showing the buckler-finger on its return or inactive stroke. Fig. 4 is a sectional side elevation of the same looking from the central longitudinal line of the machine toward one side. Fig. 5 is a longitudinal sectional elevation of one of the sheet-controlled mechanisms, showing the parts in the position assumed when feeding a sheet. Fig. 6 is a similar view showing the parts in the position assumed after the feeding stroke has been arrested by the automatic tripper and the feeding-carriage and push-fingers have been elevated. Fig. 7 is a rear elevation, partly in section, of one of the feeder-carriages. Fig. 8 is a detail plan view of part of the feeder-carriage and the push-fingers mounted thereon. Fig. 9 is an enlarged sectional elevation of one of the tripping mechanisms which control the feeding operation of the carriages. Fig. 10 is a detail plan view of a part of the same. Figs. 11 and 12 are detail views of the preferred form of push-finger. Figs. 13 and 14 are respectively a front elevation and a detail sectional elevation of the mechanisms for simultaneously adjusting the feed mechanism and tripper mechanism transversely of the machine. Fig. 15 is a detail sectional elevation of the sheet-calipering mechanism, also the mechanism for detecting a rumpled sheet and a part of a folding-machine to indicate the relation of these mechanisms thereto. Figs. 16 and 17 are detail views of the clutch operated by the calipering mechanism. Fig. 18 is a view similar to Fig. 15, showing one of the tripped positions of the calipering mechanism. Fig. 19 is a detail view showing another tripped position of the sheet-calipering mechanism. Figs. 20 and 21 are detail views illustrating a modified adjusting device for the calipering mechanism. Fig. 22 is a side elevation of the pile-governor mechanism. Fig. 23 is plan view of the same, and Fig. 24 is a detail plan of part of same in inoperative position.

The framework of my improved machine may be of any suitable construction to properly support the several mechanisms hereinafter referred to and I will not specifically describe the same.

The pile P of paper to be fed to the folder, printing-press, ruling-machine, or other machine to operate upon the paper is mounted upon an automatically-adjustable table, which is intermittently elevated under the control of an automatic device in the manner well understood. The table and elevating-screws are not shown in the drawings, the improved form of automatic governor for controlling the height of the pile, as hereinafter described and illustrated, being designed to operate any approved form of table-elevating mechanism.

A longitudinally-adjustable buckler-supporting frame comprising side bars 1 and a transverse connecting-bar 2 is mounted upon

the side frames of the machine in substantially the same manner as described in my Patent No. 623,770. This adjustable frame extends forwardly over the pile of sheets to be fed, and mounted upon the transverse bar 2 of said frame are two sets of my approved adjustable sheet-buckling mechanisms, one of which I will now proceed to describe.

5 is a casting mounted upon the bar 2 and adjustable thereon transversely of the pile of sheets.

6 is a vertically-adjustable slide or bracket-arm which is vertically movable in the guideway formed in the rear face of the casting 5 and held in any desired adjusted position by means of the screw 7, controlled by the crank 8. At the lower end of the vertically-sliding bracket-arm 6 is formed a horizontally-extending plate 9, upon the rear face of which is formed integral horizontal flanges 10, forming, with the plate 9, a dovetailed guideway for the reception of the horizontally-reciprocating buckler slide or carriage 11.

12 is the buckler-finger, journaled upon a bolt 13, which projects from the buckler-slide 11.

The buckler mechanism as far as described is substantially the same as set forth in my pending application, filed September 24, 1898, Serial No. 691,755.

15 is a holding-down foot or clamp formed at the forward end of an arm 16, which is journaled at 17 in the bracket 18 of the plate 9.

19 is a lever journaled at 20 upon the forward face of the plate 9 and provided with an antifriction-roller 21, journaled upon a stud upon lever 19. Lever 19 is connected to the heel 23 of arm 16 through the medium of a link 24.

Journaled in brackets 25, secured to the vertical slide 6, is a short rotary shaft 27, having keyed to it a cam 28, which intermittently engages the antifriction-roller 21 of lever 19 for raising the holding-down foot or clamp 15 from the pile. The holding-down foot or clamp is provided with a torsional spring 29, giving it a normal spring tendency to move into engagement with the pile. This torsional spring 29 is mounted upon the journal 17 in a manner well understood.

30 is an auxiliary frictional device operating adjacent to the holding-down foot or clamp 15, such as covered, broadly, in my Patent No. 615,817, granted December 13, 1898.

The buckling-finger 12 is provided with the customary torsional spring 12^a for forcing it downwardly into engagement with the pile and a heel 31, projecting rearwardly from the bolt 13 and carrying an antifriction-roller 32, which operates in engagement with the straight face 33^a of a lever 33, which is journaled at 34 to the slide 6. The lever 33 carries an antifriction-roller 35, which is engaged by a cam 36, keyed to the shaft 27.

37 is a long link pivoted at 38 to the upper end of the slide 6 and connected at its lower end through the medium of the link 39 with the journal-bolt 13 of slide 11.

40 is a crank-pin upon cam 36, and 41 is a pitman connecting crank 40 with the link 37. By these means the buckling-finger is raised and lowered and reciprocated forward and back transversely of the pile in a manner which I will now describe. The rotation of crank-pin 41 oscillates the link 37 and causes it to reciprocate the slide 11, which carries the buckling-finger 12. While the buckling-finger is moving inwardly, the cam 36 being disengaged from roller 35, the spring of the buckling-finger will hold it in engagement with the pile. As soon as the finger starts to move back, however, the cam 36 engages roller 35 and forces lever 33 into engagement with the heel of the buckling-finger and elevates the finger, the roller 32 traveling upon the straight face 33^a while the finger is moving rearwardly in elevated position.

50 is the main operating-shaft of the machine, suitably journaled in the machine-frame and operated in any suitable manner.

51 is a short shaft journaled in the bracket 52, keyed to the side frame of the machine.

53 54 are worm-gears keyed, respectively, to the shaft 50 and shaft 51 and meshing with each other.

55 is a universal joint connecting the shaft 27 with a shaft-section 56.

57 is a universal joint connecting a hollow shaft-section 58 with the short shaft 51. The shaft-section 56 telescopes with the shaft-section 58 and has a spline connection therewith. By means of this sectional telescoping driving-shaft communicating motion from the main shaft of the machine to the buckler-shaft 27 it will be observed that the buckler mechanism may be adjusted vertically, horizontally, or transversely of the machine without requiring a separate adjustment of the operating-shaft, said telescoping shaft automatically adjusting itself to the changed position of the buckler mechanism.

It will be understood that two sets of the above-described sheet-buckling mechanisms are to be used at the opposite rear corners of the pile of sheets to simultaneously buckle the rear corners of the sheet.

I will now proceed to describe the improved sheet-feeding devices which take the partially-separated sheet after it is buckled and feed it from the pile to the drop-roller or delivery mechanism. There are two of these sheet-feeding mechanisms arranged in parallel longitudinal planes above the pile of sheets; but I will only describe one of them, they being substantially duplicates.

Keyed to the main operating-shaft 50 within the side frames of the machine, at each side, is a cam 60, upon which operates an antifriction-roller 61, journaled upon a stud 62, projecting from the face of a slide 63. The slide 63 is mounted in vertical guideways 64, formed in a frame-piece 65 of the machine.

The slide 63 is formed with an elongated slot 66, through which the shaft 50 extends, the slot allowing the slide to reciprocate vertically in the guideways 64.

Mounted rigidly upon the lower end of the slide 63 is a track-bar 70, upon which is mounted the horizontally-reciprocating carriage 71. The carriage 71 has secured to it a bracket-arm 72, which is capable of vertical adjustment thereon.

75 75 indicate the push-fingers, which are journaled at 76 in the bracket-arm 72 and are provided at their forward ends with rubber blocks 77. The push-fingers are provided with adjustable tension-springs 78, which hold them into engagement with the pile of sheets when they are in operation.

79 indicates heels projecting from the journals 76 of the push-fingers 75, which are engaged by lugs or tappets 80, adjustably mounted upon a rod 81, which is longitudinally movable in brackets 82 of the bracket-arm 72. Pivoted to the forward end of the rod 81 is a bell-crank lever 83, which is journaled at 84 to the carriage.

85 is an antifriction-roller journaled in one arm of the bell-crank lever 83.

90 is a rock-shaft journaled in the side frames of the machine and operated in any suitable manner.

91 is a rock-arm keyed to the shaft 90 and having journaled to its lower end a link 92, provided with an antifriction-roller 93, which engages a notch 94 in the upper face of the carriage 71.

95 is a spring connecting the heel 96 of arm 92 with the rock-arm 91.

97 is a longitudinally-movable rack-bar supported upon the carriage 71 and formed with a beveled rear end 98, which rests normally directly beneath the antifriction-roller 93. When the rack-bar 97 is forced rearwardly upon the carriage 71, the antifriction-roller 93 of arm 92 is lifted out of engagement with the notch 94, thereby effectively disconnecting the operating device from the carriage and arresting the feeding motion of the carriage. The movement of the rack-bar for accomplishing this purpose is effected by the automatic tripping mechanism, which I will now describe.

100 indicates one of a series of knurled wheels or rollers journaled upon a driven shaft 101 at the forward edge of the pile of sheets directly above the stationary front guides 102. The rollers 100 lift the forward edge of the sheet as it is forced forward by the push-fingers.

103 is one of a pair of circumferentially-grooved wheels or rollers keyed to a constantly-rotating shaft 104 a little in front of the shaft 101.

105 is a bracket-arm depending from and adjustable upon the slide 63.

106 is a sheet-guiding rod mounted upon the lower end of the bracket-arm 105 for confining the sheet within the plane of feed.

107 is a trip-finger journaled at 108 upon the bracket-arm 105. The trip-finger 107 is formed with two legs which rest normally within the grooves of the wheel or roller 103.

109 is an arm projecting from the journal of the trip-finger 107, and 110 is a small adjustable weight mounted upon arm 109. Journaled to the heel 111 of the trip-finger is a vertically-extending rod 112, which passes freely through an ear 113, formed on the pawl 114, journaled at 115 to a bracket 116, the pawl being located in proper position to engage the rack-bar 97.

117 is an adjustable nut mounted upon rod 112 and adapted to engage the ear 113 for supporting the pawl 114 in inoperative position.

I have found it sometimes desirable to provide the circumferentially-grooved wheels or rollers with a central ring or portion 103^a, of rubber or other frictional material, to further insure the raising and carrying forward of the edge of the sheet. It will be observed that with this sheet-actuated tripping device the sheet is fed forward by the push-fingers, causing its front edge to engage the trippers which hold the sheet into frictional engagement with the grooved rollers and cause said rollers to carry the forward edge of the sheet forward until the tripper-fingers are raised and the push-fingers are arrested.

120 is a cam-plate secured to frame 65 just above the reciprocating carriage 71 in position to engage the antifriction-roller 85 when the carriage is elevated by the cam 60, the engagement of said plate with the antifriction-roller causing the push-fingers 75 to be raised upon the carriage simultaneously with the vertical movement of the carriage away from the pile. This operation takes place immediately after the operating mechanism has been disengaged from the carriage by the tripping mechanism just described.

In Figs. 11 and 12 I have shown in detail the preferred form of push-finger. The finger 75 is formed at its forward end with an angular bracket 125, against which is securely fastened a plate 126 by means of the screw 127. 128 is a flat block of soft rubber having a rounded upper end formed by cutting off its upper corners. The block 128 is provided with a plurality of holes 129, through which a screw 130 is adapted to pass for confining the block 128 between the bracket 125 and plate 126, this connection allowing at the same time an easy transverse movement of the rubber upon the push-fingers to enable it to automatically adjust itself to the surface of the sheet which is being operated upon. The plurality of holes allows for a vertical adjustment of the block upon the push-fingers, so that it may be lowered slightly as it becomes worn in use.

It is very desirable to provide means for the convenient adjustment of the automatic tripping mechanism transversely of the machine to suit the adjustment of the feeding mechanism transversely of the machine, and for

this purpose I provide mechanism clearly illustrated in Figs. 13 and 14 of the drawings. Rigidly secured to the transversely-adjustable frame-piece 64 (in which the feeder mechanism is mounted) is an arm 275, which extends outwardly and downwardly to a point adjacent to the shaft 104, where its end is formed into a thin fin 276, which engages the circumferential groove 277 of the elongated roller 278, which has a spline connection 279 with shaft 104. The roller 278 takes the place of the usual continuously-rotating roller of the sheet-delivering device. I form the roller of elongated shape to avoid the necessity of frequently adjusting the drop-roller which coöperates therewith. 280 is one of the drop-rollers, which operates as usual, being mounted upon a suitable journal 281, supported in the usual manner in rock-arm 282, keyed to rock-shaft 283, to which a rocking motion is imparted in the usual way. If it become necessary to adjust the drop-rollers, the rock-arms may be adjusted upon their shaft 283. This can be accomplished by reason of the key 284 and set-screw 285. The grooved wheel or roller 103 is formed integral with elongated roller 278, so as to be moved with it. By adjusting the carriage-supporting frame it will be clear that the tripping mechanism and under feed-roll of the delivery device will be carried into proper adjusted position therewith.

At the delivery end of the machine, in the central longitudinal line thereof, I arrange my improved mechanical sheet-calipering device, which is designed to accurately caliper the thickness of the successive sheets as they pass from the machine and automatically shift the clutch for arresting the operation of the machine when an improper thickness of sheet passes or when a sheet becomes rumpled by the action of the feed-tapes which convey the sheets to the folder or other machine. I will now proceed to describe this mechanism, and in this connection particular reference is made to the electrical sheet-calipering device covered by my above-named patent, No. 623,770, upon which my present device is an improvement.

Adjacent to one end of the shaft 50 is keyed a cam 135, with which constantly engages an antifriction-roller 136, journaled upon the upper end of a rod or bar 137. The rod or bar 137 is formed with a yoke portion 138, which embraces and guides upon the shaft 50. The lower end of the rod or bar 137 is journaled at 139 to the rock-arm 140, which is keyed to a rock-shaft 141, journaled in the brackets 142 of the machine-frame. The rock-shaft 141 extends transversely of the machine at or adjacent to the central longitudinal line thereof, at which point it has keyed to it a short rock-arm 143, for the purpose which will presently appear.

145 is a rock-shaft to which is keyed one of the calipering members 146, which is held normally directly beneath the plane of feed of the sheets. A rod 147 is journaled to the calipering-finger 146 and passes downwardly through a bracket-bearing 148 and carries a spiral expansion-spring 149, which is confined upon the rod 147, between the bracket-bearing 148 and a collar 150 upon the rod. The spring 149 gives the calipering-finger 146 a spring tendency to move upwardly into the path of the sheets.

151 is a rock-arm keyed to the shaft 145 and formed with a shoulder 152, which intermittently engages an adjustable screw-stop 153, threaded into the lug 154 on part of the frame. The screw-stop 153 limits the movement of the calipering-finger 146 under the action of the spring 149 when released by the controlling-cam. The arm 151 is also formed with a heel 155, which projects down adjacent to the rock-arm 143, so as to be engaged by said rock-arm to hold the calipering-finger 146 in retracted position beneath the plane of feed. The rock-arm 143 normally engages the heel 155 of arm 151 for this purpose and is disengaged for an instant only during each revolution of the shaft, so as to allow the calipering member 146 to operate.

160 is a stationary transverse frame-bar supported above the plane of feed, and 161 is a bracket adjustably mounted upon the bar 160.

162 is a long upright arm journaled to the bracket 161 at 163 and formed with a rearwardly-projecting curved foot 164, the arm 162 and foot 164 being, in effect, a bell-crank lever, with a very long arm extending vertically. The foot 164 rests normally just above the plane of feed of the sheets and is adjustably supported in this position by means of a screw-stop 165, threaded into a lug 166 of the bracket 161 and engaging the vertical face of arm 162.

165[a] is a spring connecting arm 162 to bracket 161 for the purpose of holding the upper calipering member in position with a yielding pressure. The upper end of the arm 162 engages and supports a rock-arm 167, which is keyed to a rock-shaft 168, journaled in the side frames of the machine and provided with means for operating the clutch, hereinafter described, which throws the machine into and out of operation. The rock-arm 167 has journaled to it an antifriction-roller 169, which operates upon the face of a cam 170, keyed to the shaft 50.

171 is an arm formed integrally with or rigidly attached to the rock-arm 167, and 172 is a weight adjustably mounted upon the arm 171 for insuring the downward movement of rock-arm 167, causing the shaft 168 to be rocked for operating the clutch.

As the calipering-foot 164 above the plane of sheets is directly above the calipering-finger 146, which is below the plane of sheets, it will be clear that when the finger 146 is allowed to move upwardly toward the shoe 164 the presence of an unusual thickness of sheets between said members 146 and 164 will lift

the member 164 slightly and rock the arm 162 forwardly, causing it to disengage the rock-arm 167. The rock-arm 167 will be suspended in elevated position for an instant until the low portion of cam 170 reaches the antifriction-roller 169, when the roller will enter the low portion of the cam and will allow the arm 167, under the action of weight 172, to drop into this lower position, as shown in Figs. 18 and 19, this movement rocking the shaft 168 and throwing the clutch of the machine, as hereinafter explained.

It sometimes happens that in feeding the sheets over a feeding-machine to the folder, ruling-machine, or other machine designed to operate upon the sheets the feeding-tapes leading from the feeder cause the sheets to rumple, and if such rumpling of sheets is not arrested the succeeding sheets from the feeder will be rammed into them, causing not only the destruction of the sheets, but sometimes the breaking of the machine. To avoid this defect, I provide, in addition to the above-described sheet-calipering device, certain devices for detecting the passage of a rumpled sheet, and I will now describe these devices.

Journaled at 175 on the bracket 161 is an arm 176, which curves downwardly and forwardly and is formed with a straight portion, which is normally suspended directly above and parallel with the plane of feed of the sheets. This arm is supported in the desired position by means of a screw-stop 177, threaded into a lug 178 and engaging the arm 176, as indicated in dotted lines in Figs. 15 and 19. Journaled upon the arm 176 is an antifriction-roller 179, which normally rests in engagement with the face of the arm 162. When a sheet becomes rumpled upon the feed-tapes beneath the arm 176, said arm will be moved upon its journal 175, causing the antifriction-roller 179 to engage and rock the arm 162 from the rock-arm 167 with the same result as when calipering the sheet. I also provide an arm 180, journaled to bracket 161 at 181 and extending beyond the arm 176 to the folding-machine or other machine to which the sheets are to be fed, said arm 180 having a horizontal portion normally supported above and parallel with the feed-tapes the same as the arm 176. The arm 180 is formed with a rearwardly-projecting heel 182, which engages a forwardly-projecting heel 183, formed integrally with or attached to the upper calipering member 162 to 164. If a rumpled sheet succeeds in passing beneath the detecting-arm 176, it will engage the arm 180 and cause the heel 182 to engage heel 183, and thereby rock the arm 162 out of engagement with the rock-arm 167 to cause the throwing of the clutch and the arresting of the feeding-machine. 184 is a screw-stop for adjusting the position of the arm 180. In Fig. 19 of the drawings I have shown the arms 176 and 180 in the position assumed when tripped by the presence of a rumpled sheet, the sheet being shown at X. In the usual operation of this mechanism one or the other of arms 176 180 arrests the machine; but they seldom operate together, both being shown in operation in the same figure (Fig. 19) merely for convenience.

In place of relying on the adjusting-screw 153 beneath the plane of feed and in an inconvenient position I prefer to provide an adjustment for the upper calipering member, as shown in Figs. 20 and 21. In this form of the mechanism the upright arm 162 is made separate from the foot 164, both of these parts being journaled upon the journal 163. The part 164 has an upwardly-projecting arm 164^a, resting alongside the part 162, which is formed with a yoke 164^b, through which extends a screw-stud 164^c, threaded into part 162. A washer 164^d is confined against yoke 164^b to hold parts 162 and 164 in juxtaposition. The adjusting-screws 164^c are threaded through the ends of yoke 164^b and engage opposite sides of the stud 164^c, and by means of them the relation of part 164 to part 162 can be adjusted to a nicety, and as the relation of part 164 to the other calipering member 146 depends upon the relation of part 162 to part 164 the relative adjustment of the calipering members can be accomplished in this way. Upon the end of shaft 50 outside of the side frame of the machine is a main power-gear 185, having attached to or formed integral with it one member of the automatic clutch. This member of the clutch on gear 185 is shown in the form of a cam-shaped shoulder 186, having a notch 187 for the engagement of the clutch-dog 188. The dog 188 is journaled at 189 to an arm 190, which is adjustably secured to the shaft 50, outside of gear 185, by means of a tap-bolt 191. Formed integral with arm 190 is a plate or flange 192 for the purpose presently to be explained. 193 is a spring-arm secured to shoulder 194 of arm 190 and having journaled to its free end a small antifriction-roller 195, which is adapted to engage the angular faces of the lug 196, attached to or formed upon the face of the rear portion of dog 188 to hold the dog in engaged or disengaged position. Keyed to the end of rock-shaft 168 is a clutch-operating arm 197, formed with a depending finger 198, which arm and finger are supported in the same longitudinal plane with the clutch-dog 188. Keyed to the rock-shaft 168 inside the side frames of the machine is one or more operating rock-arms 199, to one of which may be connected an operating-rod, such as 200, extending forward or backward to a convenient point of operation. The rock-arms 199 are for returning the parts to normal operative position after the machine has been thrown out by the calipering mechanism. Assuming now that the caliper 146 164 or one of the rumpled sheet-detecting arms 176 180 has tripped the arm 162 and disengaged it from rock-arm 167, as above described, allowing arm 167 to drop under the action of weighted arm 171 when the low portion of cam 170 reaches anti-

friction-roller 169, the rock-shaft 168 will be rocked to throw arm 197 into engagement with the cam-surface 188[a] of dog 188, thereby forcing the heel 188[b] of said dog downwardly into engagement with the plate or flange 192, the nose of the dog being withdrawn from the notch 187 to release the main gear 185 and arrest the operation of shaft 50 and all the operating parts of the machine which are driven therefrom. When the dog is disengaged in this manner, the spring-arm 193 yields outwardly under the action of angular lug 196 upon antifriction-roller 195, causing said roller to disengage the under angular face of said lug and engage its upper angular face for holding the dog in disengaged position. When it is desired to start the operation of the machine, the rock-shaft 168 is rocked rearwardly by one of the hand-levers, causing finger 198 to engage the forward end of dog 188 and force it downwardly until the lug 188[c] rests upon the plate or flange 192, the spring-arm 193 operating, as before, to give the dog a spring tendency to move into engagement with the other clutch member. The continuously-rotating gear 185 brings the cam-shoulder 186 around into engagement with the nose of the dog and lifts it slightly till the dog springs into engagement with the notch to again lock the clutch members together when the machine immediately starts off. When the rock-shaft 168 is operated, as described, to throw the clutch members into engagement, the rock-arm 167 is lifted and (the improper thickness of sheets having been removed from the caliper or the rumpled sheets from beneath the detecting-arms) the long rock-arm 162 and caliper-foot 164 will automatically return to normal position.

I will now proceed to describe the improved governor and table-elevating mechanism, whereby the height of the pile of sheets may be maintained at the proper level.

The pile-supporting table (not shown) is mounted, as usual, upon the vertical elevating-screws 205, upon the upper end of one of which is keyed a ratchet-wheel 206. The screws are geared together in any suitable manner, (not shown,) so as to rotate in unison for raising both sides of the table equally.

210 is a rock-arm journaled upon the vertical shaft 205, directly beneath the ratchet-wheel 206.

213 is a rod journaled to the dog 211 at 214, said rod 213 extending through an enlarged opening in a lug 215, formed on the rock-arm 210.

216 is a spiral spring surrounding rod 213 and confined by the lug 215 to hold the dog 211 yieldingly in engagement with the ratchet-wheel 206.

217 is a knob formed on dog 211, by which the dog may be thrown into inoperative position against the limiting-lug 218, the spring-rod 213 being so arranged as to hold the dog in either its operative or inoperative position. In Fig. 22 the dog is shown in operative position, while in Fig. 23 it is shown in inoperative position.

Journaled to the free end of the rock-arm 210 is a reciprocating bar 220, which extends rearwardly therefrom and is formed with an end 221, which passes through a bracket-bearing 222 and supports the spiral extension-spring 223, which is confined upon the rod in any suitable manner. The bar 220 is formed with shoulders 224 and 225. Keyed to the rock-shaft 90 is a rock-arm 226, carrying at its lower end a stud 227, which is adapted to engage the shoulder 225 of bar 220 and move said bar forwardly, compressing the spring 223 and causing the rock-arm 210 to move with the bar to carry the dog 211 forward and rotate the ratchet-wheel 206. When the rock-arm 226 moves rearwardly, the spring 223 causes the bar 220 to follow it, except in case the bar is restrained by the governing mechanism, which I will now explain.

230 is a bracket-arm in which is journaled a rock-shaft 231, carrying an adjustably-mounted dog 232, which projects normally forward just above the bar 220.

233 is an arm keyed to the rock-shaft 231, and 234 is a rod journaled to the arm 233 and extending downwardly therefrom and journaled at its lower end at 235 to a rock-arm 236, keyed to a rock-shaft 237, journaled in a depending bracket-arm 230. 239 is another arm adjustably secured to the rock-shaft 237 by means of the set-screw 240, the arm 239 having journaled in its end a metal roller 241, which constantly rests upon the surface of a pile of sheets.

Assuming that the pile of sheets is a little lower than the desired working plane, the parts will be in the position shown in Fig. 22. In this position of the parts the ratchet-wheel will be operated a step at each forward motion of the rock-arm 226, causing the pile of sheets to be gradually elevated. As the pile is elevated the arm 239 is raised, and through the medium of rock-shaft 237, arm 236, rod 234, arm 233, and the shaft 231 the dog 232 is gradually lowered until it rests in the path of the shoulder 234, when upon the return movement of bar 220 said shoulder will be engaged by the dog 232 to prevent the further rearward movement of the bar 220, the rock-arm 226 being allowed free movement rearwardly by reason of the disengagement of stud 227 from the shoulder 225. The bar 220 will be held in this position until a sufficient number of sheets has been fed to lower the arm 239, which causes the elevation of dog 232, each forward movement of rock-arm 226 giving a slight forward hitch to bar 222 to release the dog 232 in case the pile has fallen sufficiently far.

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

1. The combination, in a paper-feeding machine, of a support for a pile of sheets, with suitable adjustable sheet-buckling mechan-

ism, including a buckling-finger and a holding-down foot or clamp, a driving-shaft and a connecting-shaft having universal-joint connections with the driving-shaft and the sheet-buckling mechanism, substantially as set forth.

2. The combination, in a paper-feeding machine, of a support for a pile of sheets, with suitable sheet-buckling mechanism adjustable vertically with relation to the pile and including a buckling-finger and a holding-down foot or clamp, a driving-shaft, and a connecting-shaft having universal-joint connections with the driving-shaft and the sheet-buckling mechanism, substantially as set forth.

3. The combination, in a paper-feeding machine, of a support for a pile of sheets, with suitable sheet-buckling mechanism adjustable transversely with relation to the pile and including a buckling-finger and a holding-down foot or clamp, a driving-shaft, and a connecting-shaft having universal-joint connection with the driving-shaft and the sheet-buckling mechanism, substantially as set forth.

4. The combination, in a paper-feeding machine, of a support for a pile of sheets, with suitable sheet-buckling mechanism adjustable longitudinally with relation to the pile and including a buckling-finger and a holding-down foot or clamp, a driving-shaft, and a connecting-shaft having universal-joint connection with the driving-shaft and the sheet-buckling mechanism, substantially as set forth.

5. In a paper-feeding machine, the combination of a support for a pile of sheets, with suitable sheet-buckling mechanism, a driving-shaft, and a telescoping sectional connecting-shaft having suitable connections with the driving-shaft and sheet-buckling mechanism, substantially as set forth.

6. In a paper-feeding machine, the combination of a support for a pile of sheets, with suitable sheet-buckling mechanism, a driving-shaft, a telescoping sectional connecting-shaft, and universal-joint connections between the sections of said connecting-shaft and the driving-shaft and buckling mechanism respectively, substantially as set forth.

7. In a paper-feeding machine, the combination of a support for a pile of sheets, with suitable sheet-buckling mechanism, a driving-shaft, an auxiliary shaft having gear connection with the driving-shaft, and a telescoping sectional shaft the sections of which have universal-joint connections with the auxiliary shaft and buckling mechanism respectively, substantially as set forth.

8. In a paper-feeding machine, the combination of a support for a pile of sheets, an adjustable buckler-supporting frame adjustable longitudinally of the machine, and sheet-buckling mechanism transversely adjustable upon said supporting-frame and including a buckling-finger and a holding-down foot or clamp, a driving-shaft, an auxiliary shaft, and a telescoping sectional connecting-shaft having universal-joint connections with the auxiliary shaft and buckling mechanism, substantially as set forth.

9. In a paper-feeding machine, the combination of a support for a pile of sheets, with a buckler-supporting frame, a rotary shaft journaled in said frame, a reciprocating buckler-carriage mounted in said frame, a buckling-finger mounted upon said carriage, a holding-down foot mounted upon said frame, a link journaled upon said frame and suitably connected with the buckler-carriage, means controlling the buckler-finger, a crank upon said rotary shaft suitably connected with said link, means for operating said rotary shaft, substantially as set forth.

10. In a paper-feeding machine, the combination of a buckler-supporting frame, a buckler-carriage reciprocating in said frame, a buckling-finger journaled upon said carriage and formed with a heel projecting rearwardly from its journal, a lever journaled upon the buckler-supporting frame and adapted to intermittently engage the heel of the buckling-finger, and means for operating said lever, substantially as set forth.

11. In a paper-feeding machine, the combination of a support for a pile of sheets, buckler-supporting frame, a reciprocating buckler-carriage, mounted therein, a buckling-finger journaled upon the carriage and formed with a heel projecting rearwardly from its journal, an antifriction-roller journaled in said heel, a lever journaled upon the buckler-frame and formed with a straight face adapted to engage the antifriction-roller of said heel, and a rotary cam adapted to intermittently engage said lever for throwing it into effective engagement with said antifriction-roller substantially as and for the purpose set forth.

12. In a paper-feeding machine, the combination of a buckler-supporting frame, a rotary shaft journaled in said frame, means for operating said shaft, a cam upon said shaft, a link pivoted upon said frame, means for oscillating said link from said shaft, a reciprocating buckler slide or carriage mounted in said supporting-frame, a spring-pressed buckler-finger journaled upon said slide or carriage and formed with a heel projecting rearwardly from its journal, an antifriction-roller mounted upon said heel, a buckler-finger-controlling lever journaled upon the supporting-frame and formed with a straight face which engages the antifriction-roller of the buckling-finger heel, and an antifriction-roller upon said lever which is intermittently engaged by said cam, substantially as set forth.

13. In a paper-feeding machine, the combination of a feeder-frame and a support for a pile of sheets, with a reciprocating feeding-carriage, feed-fingers movably mounted on said carriage, and means for simultaneously raising the fingers upon and with relation to the carriage and the carriage within the feeder-frame, substantially as set forth.

14. In a paper-feeding machine, the combination of a support for a pile of sheets, with a vertically-movable frame, means for operating said frame, feed-fingers movably mounted upon said feeder-carriage, and means for elevating the fingers upon the carriage thrown into operation by the vertical movement of the frame, substantially as set forth.

15. In a paper-feeding machine, the combination of a support for a pile of sheets, with a vertically-reciprocating frame carrying a horizontal track-bar, means for operating said frame, a carriage reciprocating upon said track-bar, means for operating said carriage, feed-fingers movably mounted upon said carriage, a stationary bar, and means upon the carriage connected with the feed-fingers adapted to be engaged by said stationary bar when the frame is moved upwardly to cause the feed-fingers to be elevated upon the carriage at the same time, substantially as set forth.

16. In a paper-feeding machine, the combination of a support for a pile of sheets, with a vertically-movable carriage-supporting frame, a feed-carriage mounted upon said frame, a carriage-operating device, a sheet-actuated tripping device adapted to disengage the operating device from the carriage, a feed-finger movably mounted upon the carriage, and means, operated by the upward movement of the carriage-supporting frame, for raising the feed-finger upon and with relation to the carriage, substantially as set forth.

17. In a paper-feeding machine the combination of a support for a pile of sheets, with a vertically-reciprocating frame supporting a horizontal track-bar, a carriage mounted upon said track-bar, a carriage-operating device, a sheet-actuated tripping device adapted to disengage the operating device from the carriage, feed-fingers movably mounted upon the carriage, a stationary bar, and means upon the carriage connected with the feed-fingers and adapted to be engaged by said stationary bar when the frame is moved upwardly to cause the feed-fingers to be raised upon the carriage at the same time, substantially as set forth.

18. In a paper-feeding machine, the combination of a support for a pile of sheets, with a vertically-movable carriage-supporting frame having a horizontal track-bar, means for intermittently raising and lowering said frame, a carriage mounted upon said track-bar, a carriage-operating device, means for automatically disengaging the operating device, from the carriage, feed-fingers journaled upon said carriage, a lever journaled upon said carriage and suitably connected with the feed-fingers, and a stationary bar adapted to engage said lever when the carriage-supporting frame is elevated, substantially as and for the purpose set forth.

19. In a paper-feeding machine, the combination of a support for a pile of sheets, with two sheet-feeding mechanisms arranged transversely of the machine and operating in parallel lines longitudinally of the machine, two independent sheet-actuated tripping devices controlling said sheet-feeding mechanisms and adapted to independently arrest their feeding operation without disengaging them from the sheet, and means for simultaneously elevating said feeding mechanisms out of engagement with the sheet after the feeding operation of both of said mechanisms has been arrested, substantially as and for the purpose set forth.

20. In a paper-feeding machine, the combination of a support for a pile of sheets, two vertically-movable carriage-supporting frames, reciprocating feed-carriages mounted upon said frames, feed-fingers movably mounted upon said carriages, means, controlled by the sheet fed from the machine, for independently arresting the operation of said feed-carriages, means for simultaneously raising the carriage-supporting frames, and means, operated by the upward movement of said supporting-frames, for elevating the feed-fingers upon the carriages, substantially as and for the purpose set forth.

21. In a paper-feeding machine, the combination of a support for a pile of sheets, with a feeding-carriage, a feed-finger mounted upon said carriage, and a friction-pad loosely journaled upon the end of said finger, so as to have free lateral movement enabling it to automatically adjust itself to the surface of the pile, substantially as set forth.

22. In a paper-feeding machine, the combination of a support for a pile of sheets, with a feeding-carriage, a feed-finger mounted upon said carriage, a friction-pad and a pin or screw passing through a perforation in said pad and into the feed-finger to secure the pad loosely upon the finger, as set forth.

23. In a paper-feeding machine, the combination of a support for a pile of sheets, with a feeder-carriage, a feed-finger mounted upon said feeder-carriage, and formed with an angular shoulder at its free end, a plate secured to said shoulder, a friction-pad supported between said plate and the end of the finger, and a screw or pin passing through the plate into the finger and loosely engaging the friction-pad to support it yieldingly in position, as set forth.

24. In a paper-feeding machine, the combination of a support for a pile of sheets, with a feeder-carriage, a feed-finger mounted upon said feeder-carriage, a friction-pad formed with a plurality of holes or openings, and a pin or screw passing loosely through one of said holes or openings to support the pad loosely in the desired position upon the finger, substantially as set forth.

25. In a paper-feeding machine, the combination of a support for a pile of sheets, a transversely-adjustable sheet-feeding mechanism, a sheet-actuated tripping device mounted upon the support of the feeding

mechanism, a transversely-adjustable delivery-roller with which the tripping device cooperates, and means connecting the support of the feeding mechanism with said delivery-roller, whereby it can be adjusted simultaneously with the feeding mechanism and tripping device, as set forth.

26. In a paper-feeding machine, the combination of a support for a pile of sheets, a transversely-adjustable carriage-supporting frame, a feeding-carriage mounted upon said frame, a feed-controlling sheet-actuated tripping device also mounted upon the carriage-supporting frame, a transversely-adjustable grooved delivery-roller with which the tripping device coöperates, and an arm projecting from the carriage-supporting frame and engaging a groove of said delivery-roller, substantially as and for the purpose set forth.

27. In a paper-feeding machine, the combination of a support for a pile of sheets, suitable sheet-feeding mechanism, a transversely-adjustable elongated sheet-delivery roller, and a drop-roller coöperating therewith, whereby the delivery-roller may be adjusted without the necessity of adjusting the drop-roller, substantially as set forth.

28. In combination with a paper-feeding machine, a sheet-calipering device comprising two movable members between which the successive sheets pass, one of which members is capable of movement toward the other to cause said other to move when a sufficient thickness of sheets has been interposed between the members, means for moving said first-named member toward said other member, suitable throw-out mechanism for arresting the operation of the machine, an arm or lever connected with and operating said throw-out mechanism, and an arm projecting from said other calipering member and normally engaging and sustaining said throw-out-operating arm or lever in inoperative position, substantially as and for the purpose set forth.

29. In combination with a paper-feeding machine, a sheet-calipering device comprising two movable members between which the successive sheets pass, one of which members is capable of movement toward the other to cause said other to move when a sufficient thickness of sheets has been interposed between the members, means for moving said first-named member toward said other member, suitable throw-out mechanism for arresting the operation of the machine, an arm or lever connected with and operating said throw-out mechanism, an arm projecting from said other calipering member and normally engaging and sustaining said throw-out-operating arm or lever in inoperative position, and means adapted to temporarily sustain said throw-out-operating arm or lever, when it is released by the arm of the calipering member, and allow it to operate at the proper time to actuate the throw-out mechanism, substantially as and for the purpose set forth.

30. In combination with a paper-feeding machine, a sheet-calipering device comprising two movable members between which the successive sheets pass, one of which members is capable of movement toward the other, to cause said other to move when a sufficient thickness of sheets has been interposed between the members, means for moving said first-named member toward said other member, suitable throw-out mechanism for arresting the operation of the machine, an arm or lever connected with and operating said throw-out mechanism, an arm projecting from said other calipering member and normally engaging and sustaining said throw-out-operating arm or lever in inoperative position, and a cam device adapted to engage said throw-out-operating lever and time its operation after it is released by the arm of the calipering member, substantially as and for the purpose set forth.

31. In combination with a paper-feeding machine, a sheet-calipering device comprising two movable members between which the successive sheets pass, one of which members is capable of movement toward the other to cause said other to move when a sufficient thickness of sheets has been interposed between the members, means for moving said first-named member toward said other member, suitable throw-out mechanism, an antifriction-roller upon said arm or lever, a cam engaging said antifriction-roller, means for giving said arm or lever a downward tendency, and an arm projecting from said other calipering member and normally engaging and sustaining said throw-out arm or lever, substantially as set forth.

32. In combination with a paper-feeding machine, a sheet-calipering device comprising two movable members between which the successive sheets pass, one of which members is capable of movement toward the other to cause said other to move when a sufficient thickness of sheets has been interposed between the members, means for moving said first-named member toward said other member, suitable throw-out mechanism for arresting the operation of the machine, an arm or lever connected with and operating said throw-out mechanism, an arm projecting from said other calipering member and normally engaging and sustaining said throw-out arm or lever in inoperative position, springs holding said calipering members in operative relation, and means for adjusting the relation of said members, substantially as set forth.

33. In combination with a paper-feeding machine, a sheet-calipering device comprising two movable members between which the successive sheets pass, one of which members is capable of movement toward the other to cause said other to move when a sufficient thickness of sheets has been interposed between the members, means for moving said first-named member toward said other member, suitable throw-out mechanism for arrest-

ing the operation of the machine, an arm or lever connected with and operating said throw-out mechanism, said first-named calipering member being formed of a horizontally-projecting foot, and an upright arm, means for retaining the calipering members normally in operative position, and an arm or lever connected with the throw-out mechanism and normally engaged and sustained by the upright arm of the calipering member, substantially as and for the purpose set forth.

34. In combination with a paper-feeding machine, a sheet-calipering device comprising two movable members between which the successive sheets pass, one of which members is capable of movement toward the other to cause said other to move when a sufficient thickness of sheets has been interposed between the members, means for moving said first-named member toward said other member, suitable throw-out mechanism for arresting the operation of the machine, said first-named calipering member being formed of a horizontally-projecting foot, and an upright arm, which are adjustable relatively, means for securing said parts in the desired adjusted relation, means for retaining the calipering members normally in operative position, and an arm or lever connected with the throw-out mechanism and normally engaged and sustained by the upright arm of the calipering member, substantially as and for the purpose set forth.

35. In combination with a paper-feeding machine, a sheet-calipering device comprising two movable members between which the successive sheets pass, one of which members is capable of movement toward the other to cause said other to move when a sufficient thickness of sheets has been interposed between the members, suitable throw-out mechanism controlled by said calipering device for arresting the operation of the machine, and a detecting-arm arranged adjacent to the path of the sheets, and adapted, when operated by the presence of a crumpled sheet, to actuate one of the calipering members for arresting the machine, as set forth.

36. In combination with a paper-feeding machine, suitable throw-out mechanism therefor, an operating arm or lever for the throw-out mechanism, and a sheet-calipering device including a member formed with an arm which normally engages and sustains the said throw-out-operating arm or lever in inoperative position, substantially as set forth.

37. In combination with a paper-feeding machine, suitable throw-out mechanism therefor, an operating arm or lever for the throw-out mechanism, a controlling-arm normally engaging and sustaining said throw-out-operating arm or lever in inoperative position, and a rumpled-sheet-detecting arm supported adjacent to and approximately parallel with the path of the sheets and adapted to engage and actuate said controlling-arm, substantially as and for the purpose set forth.

38. In combination with a paper-feeding machine, a suitable throw-out mechanism therefor, an operating arm or lever for the throw-out mechanism, a controlling-arm normally engaging and sustaining said throw-out-operating arm or lever in inoperative position, means temporarily sustaining and timing the operation of said throw-out-operating arm or lever when it is disengaged from the controlling-arm, and a rumpled-sheet-detecting arm supported adjacent to and approximately parallel with the path of the sheets and adapted to engage and actuate said controlling-arm, substantially as and for the purpose set forth.

39. In a paper-feeding machine, the combination of a support for a pile of sheets, and suitable feeding devices, with a main driving-shaft, a power-gear loosely journaled thereon, a clutch member formed on or connected with said gear, an arm keyed to said shaft, a clutch-dog journaled upon said arm, an angular lug upon said dog, a spring secured upon said arm, and engaging the angular lug to hold the dog in either locked or unlocked position, and means for operating said dog, substantially as and for the purpose set forth.

40. In a paper-feeding machine, the combination of a support for a pile of sheets, with suitable elevating mechanism therefor comprising an elevating-shaft, a ratchet-wheel upon said shaft, an oscillating arm carrying a pawl which operates said ratchet-wheel, a reciprocating rod or bar connected with said arm, a spring tending to hold said rod or bar in retracted position, a rock-arm adapted to engage said rod or bar and force it forward against the action of its spring, a dog adapted to engage said rod or bar and hold it in its forward position, and a pile-gaging arm connected with said dog and adapted to move it into and out of engagement with the rod or bar, substantially as set forth.

41. In a paper-feeding machine, the combination of a support for a pile of sheets, with suitable elevating mechanism therefor, including an elevating-shaft, a ratchet-wheel upon said shaft, an oscillatory pawl-carrying arm, a pawl journaled upon said arm, a stop for limiting the outward movement of said pawl upon the arm, a spring-rod passing through a guide upon said arm and journaled to the pawl at such a point that the pawl will be held into engagement with the ratchet or with the limiting-stop, and means for operating said pawl-supporting arm, substantially as and for the purpose set forth.

TALBOT C. DEXTER.

Witnesses:
J. GREEN,
WM. E. KNIGHT.