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R. S. ODER.

METHOD OF AND MACHINE FOR FEEDING PAPER.

No. 519,341. Patented May 8, 1894.

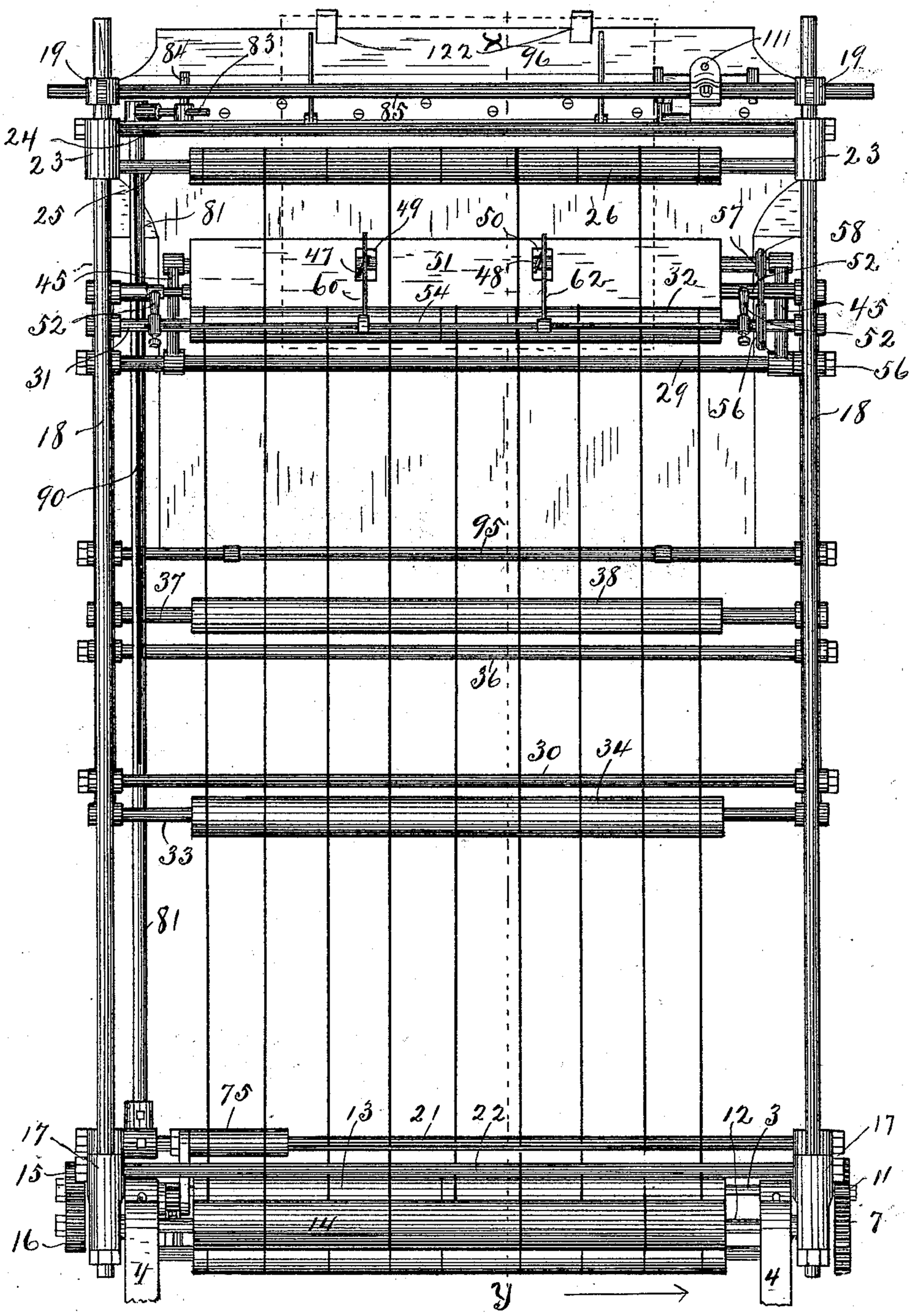

Fig I

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R. S. ODER.

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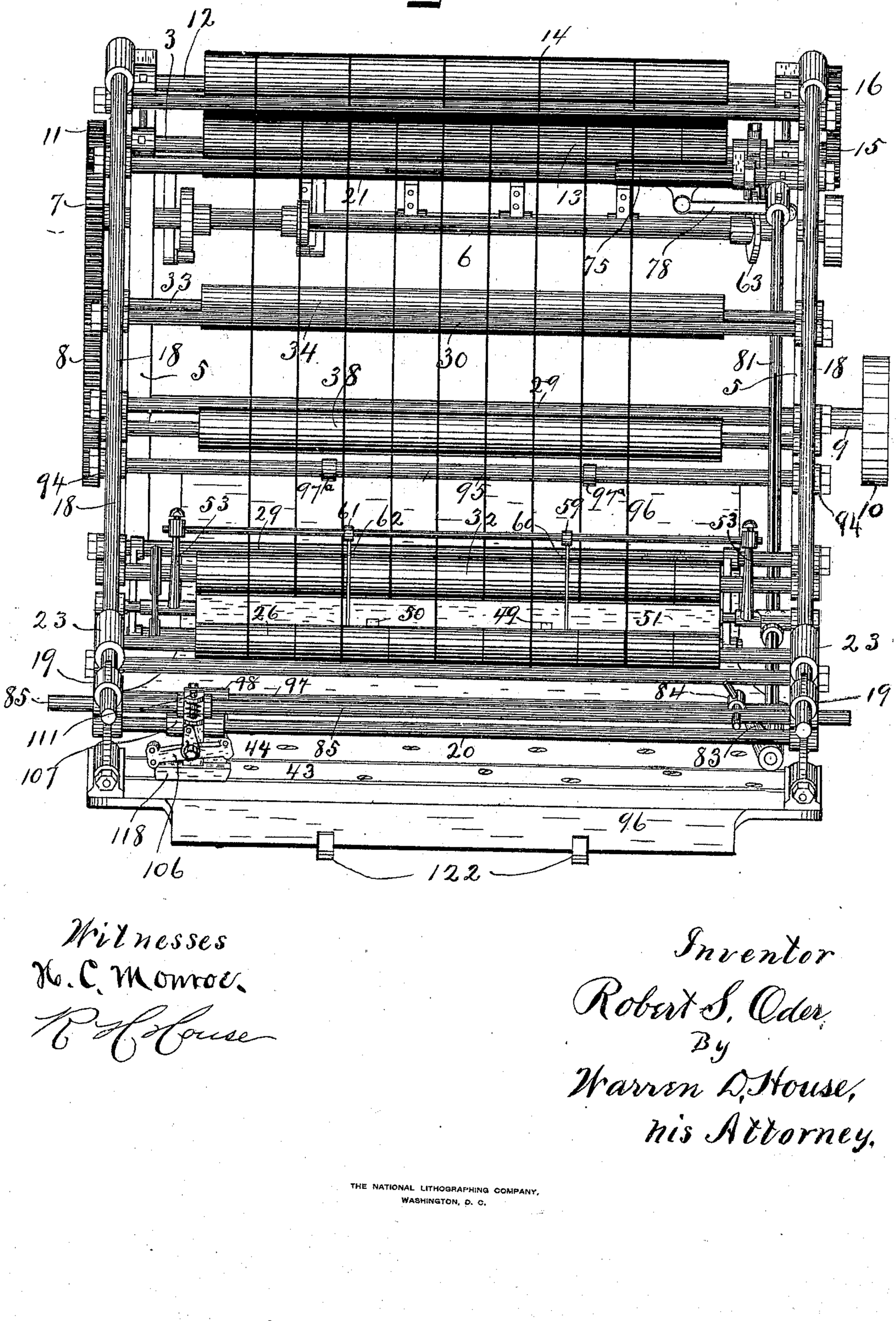
Fig II



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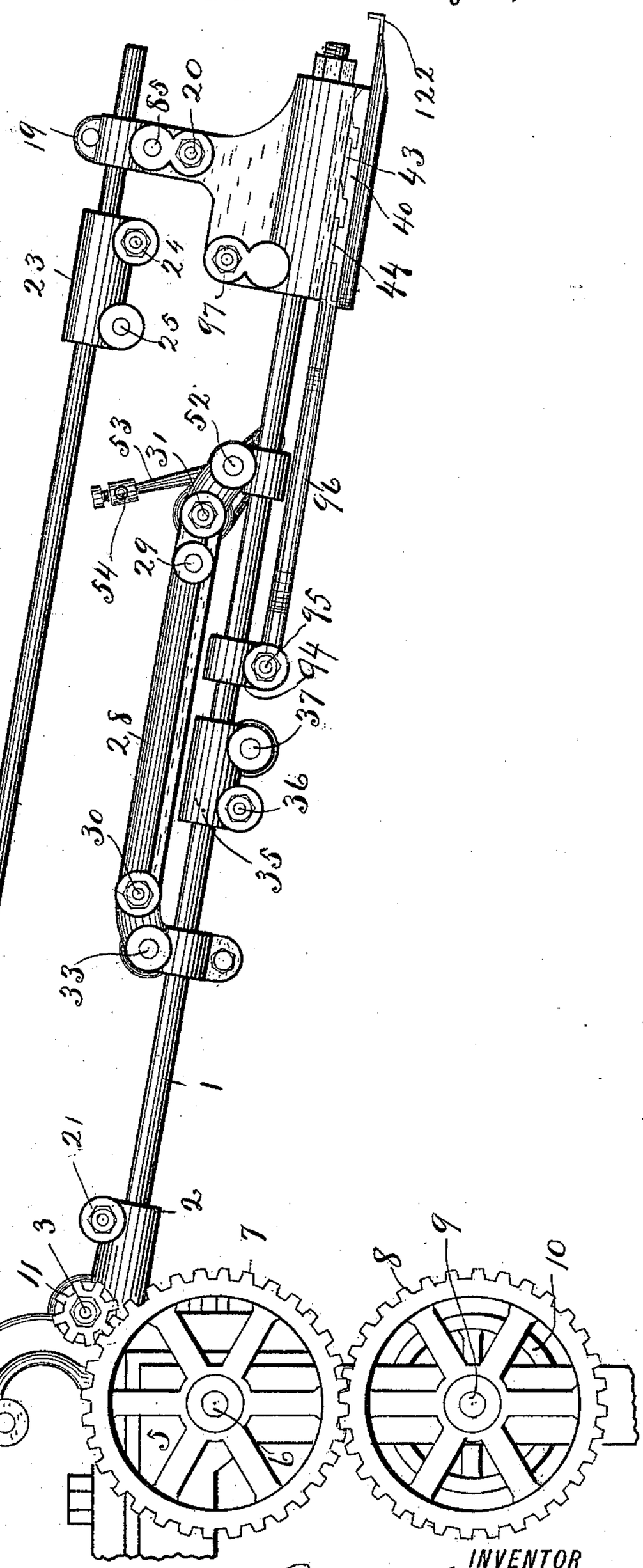

Fig. III.

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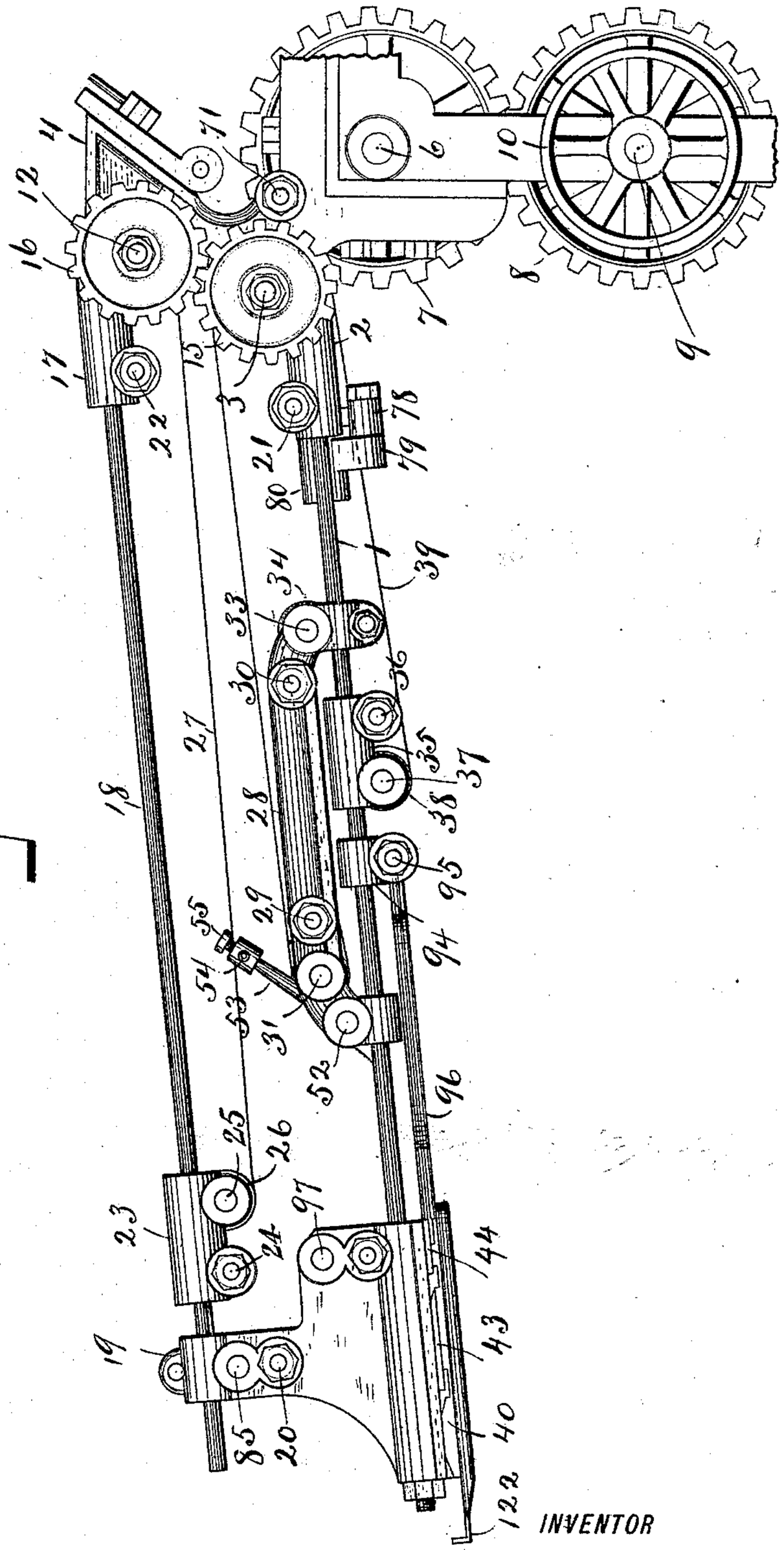
FIG. IV



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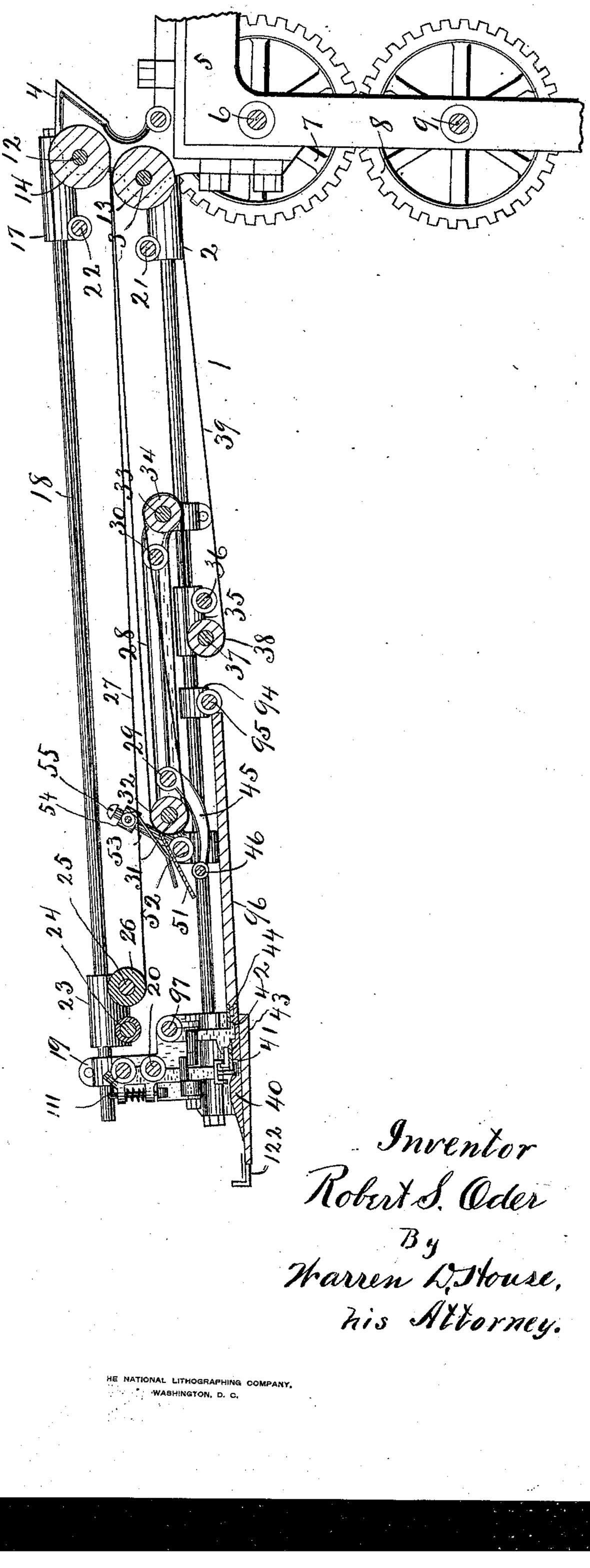

Fig V

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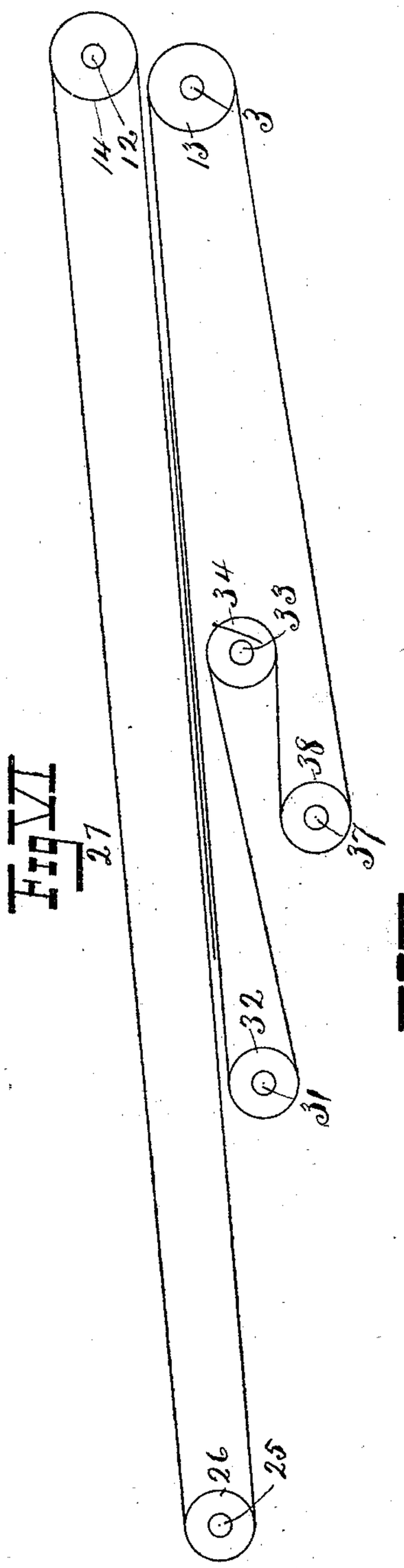

FIG VI

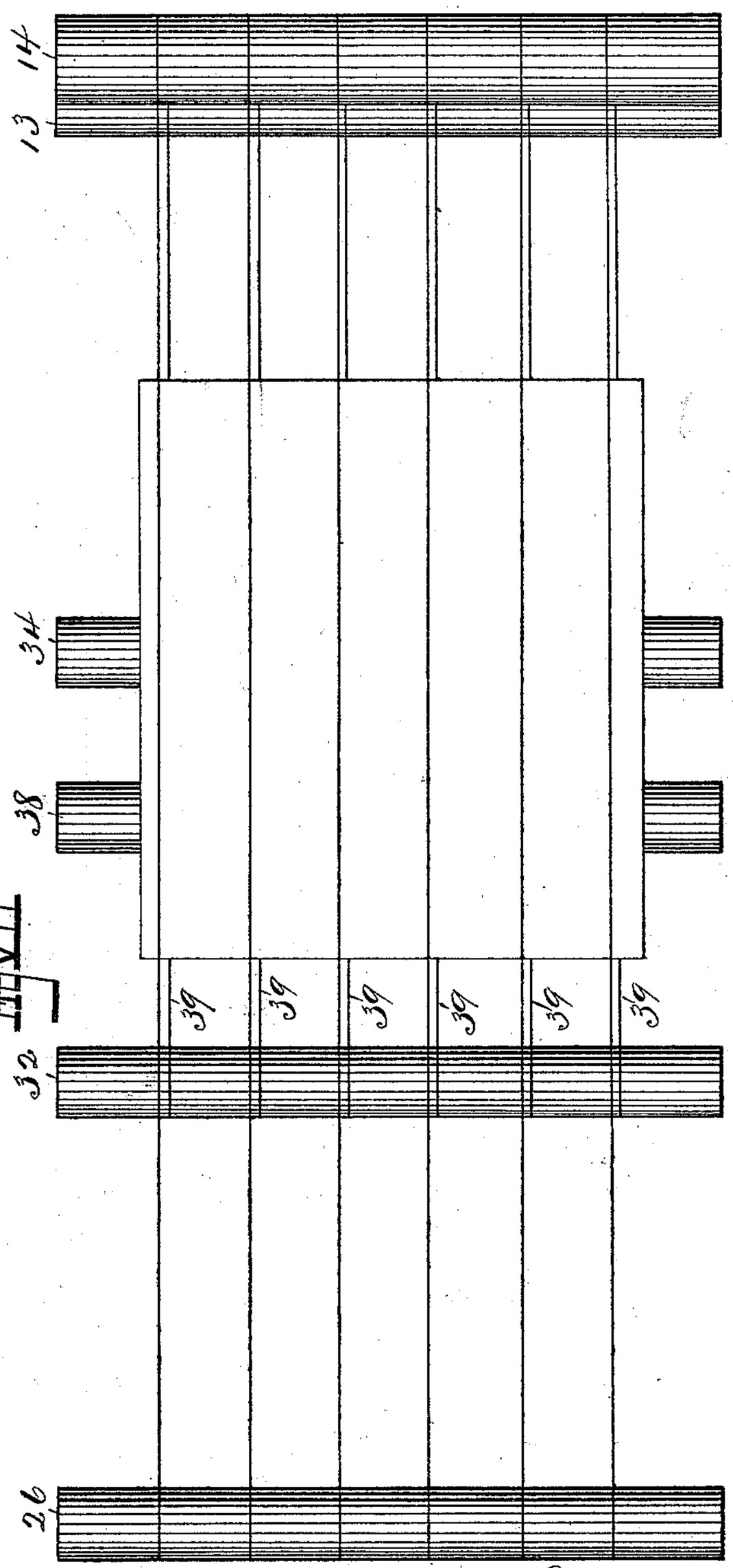

FIG VII

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R. S. ODER.

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FIG IX

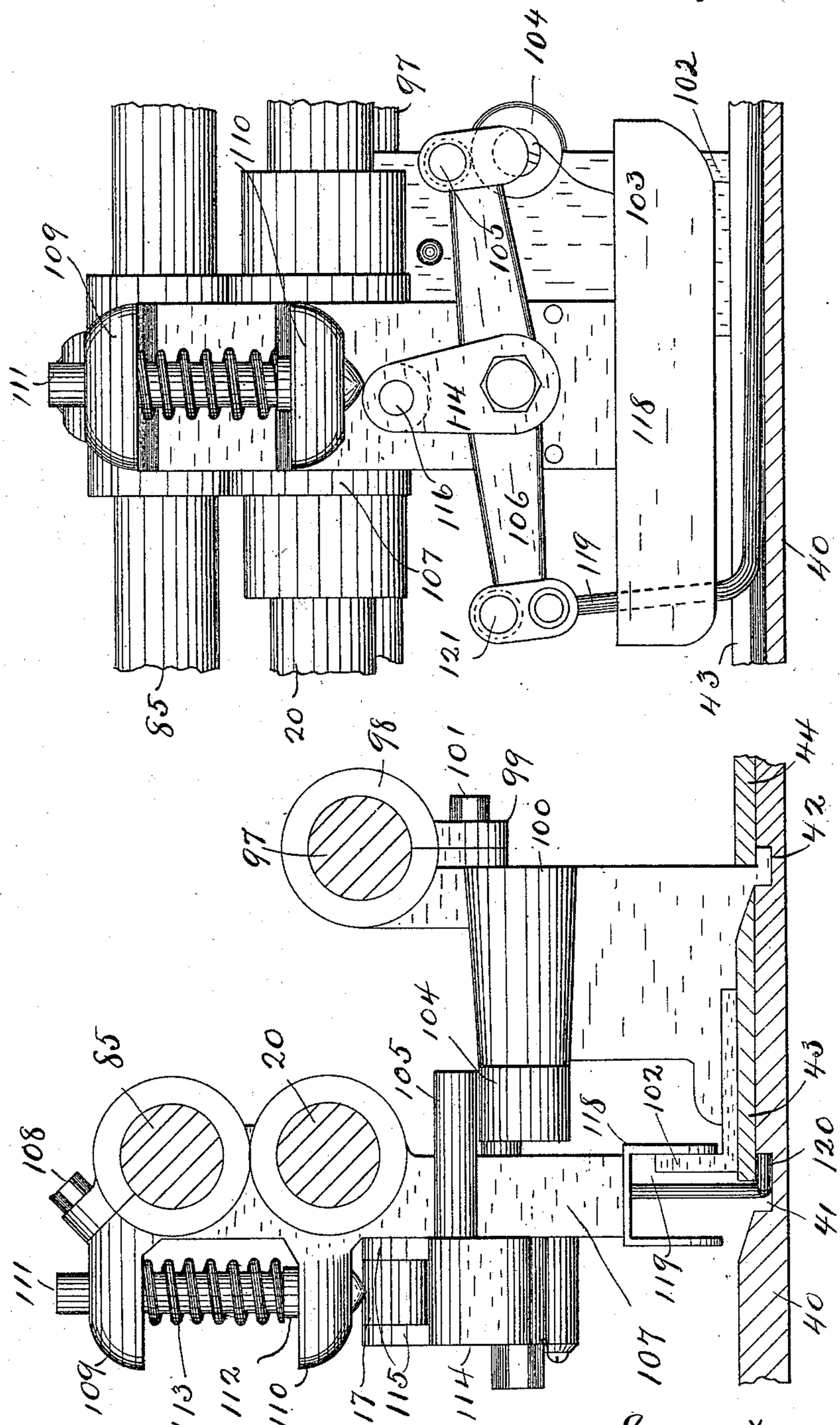

FIG VII

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Fig X

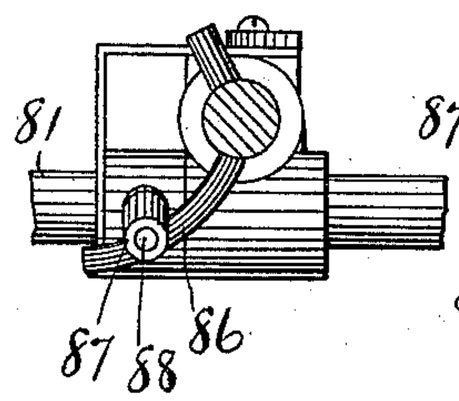

Fig XI

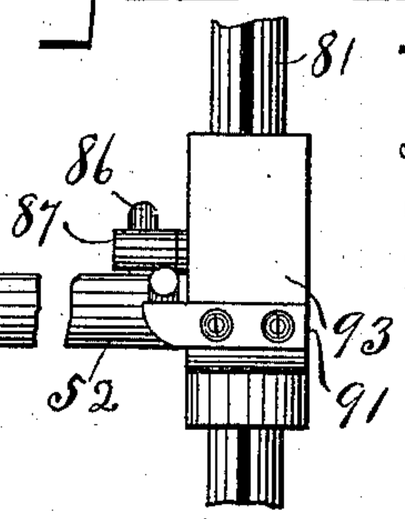

Fig XII

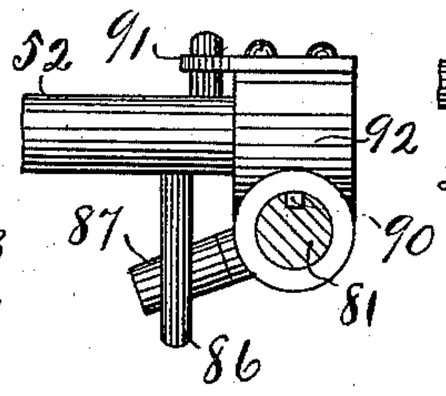

Fig XIII

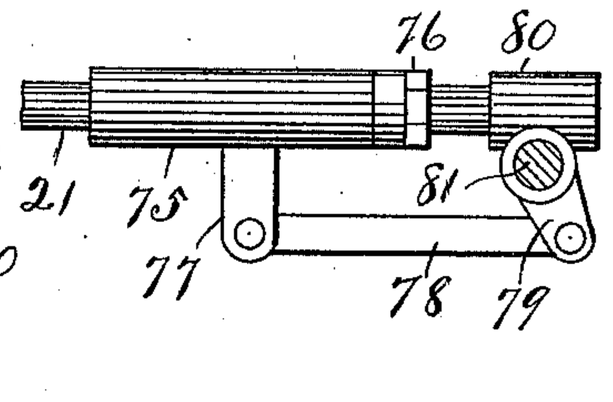

Fig XIV

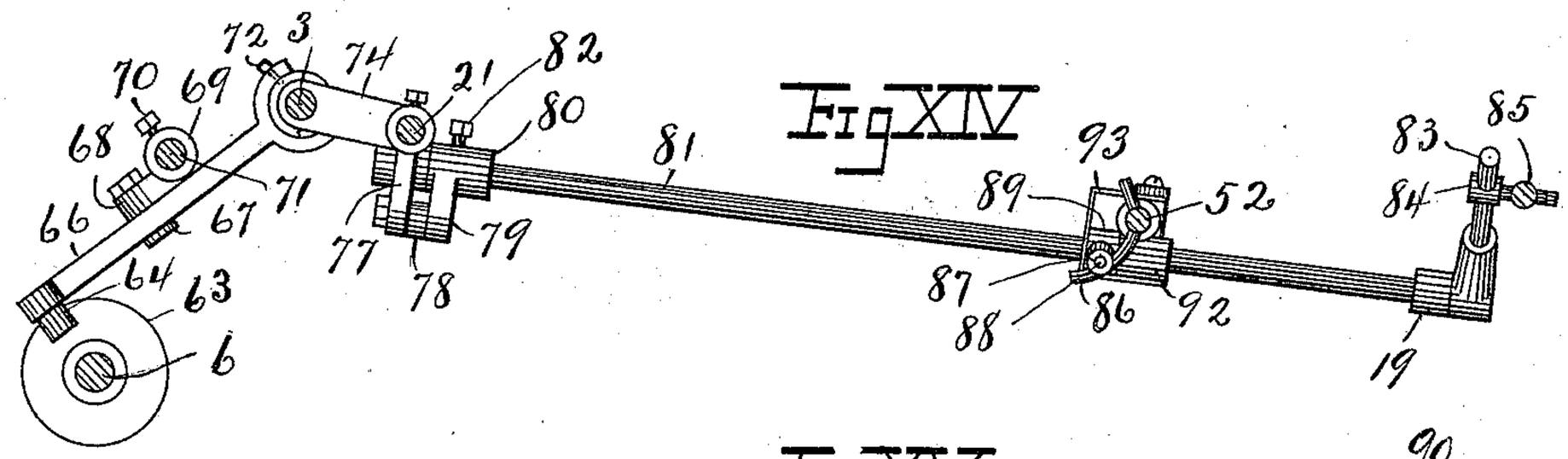

Fig XV

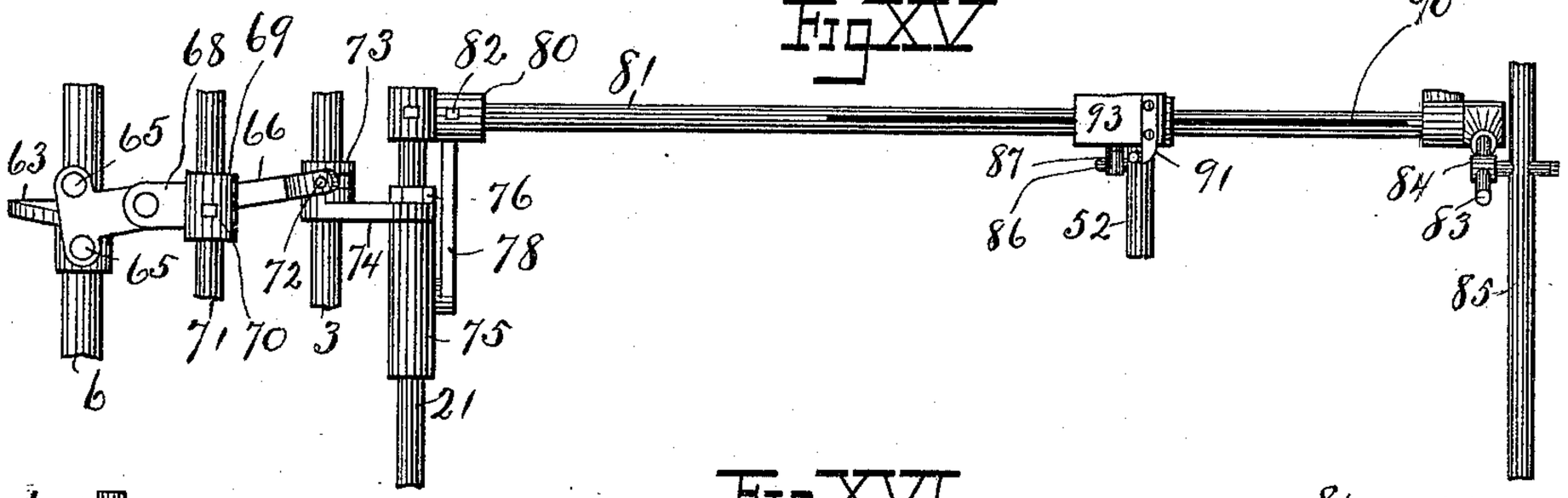

Fig XVI

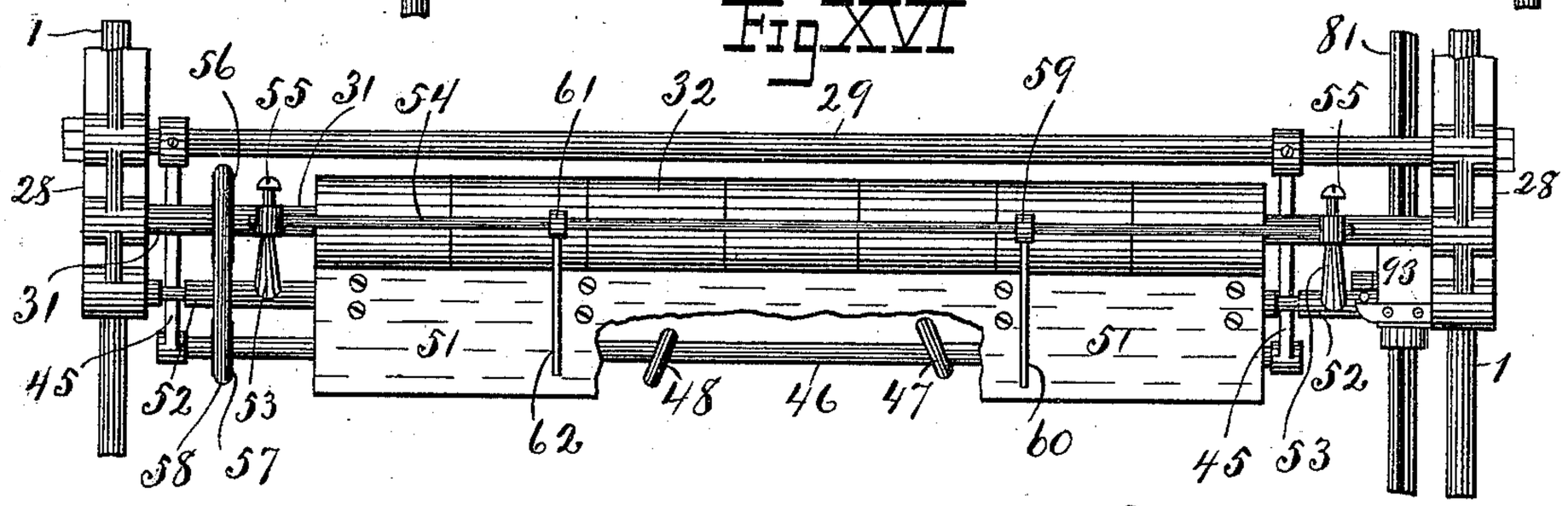

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FIG XVIII

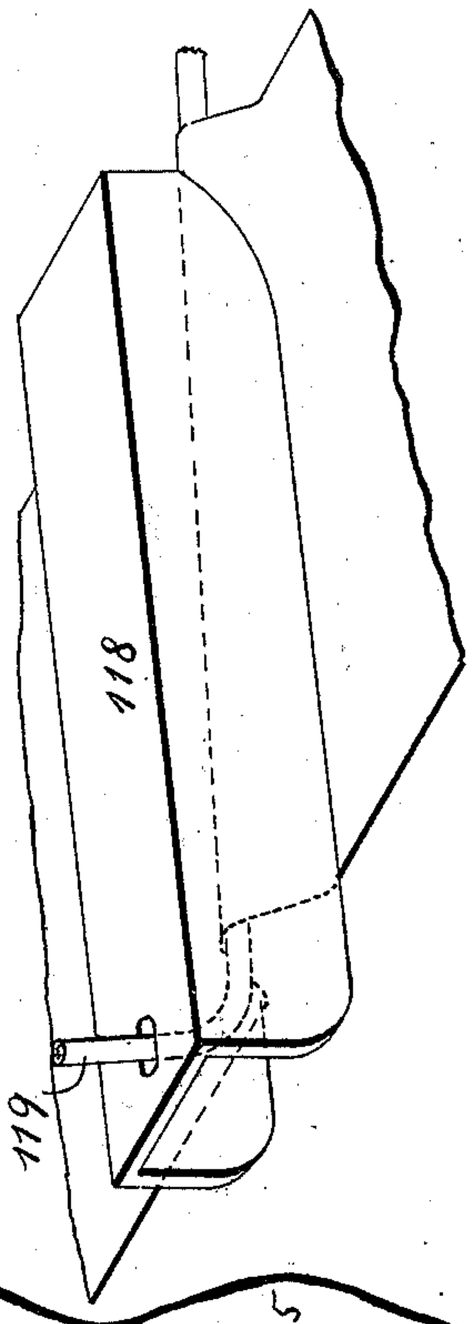

FIG XVII

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UNITED STATES PATENT OFFICE.

ROBERT S. ODER, OF KANSAS CITY, MISSOURI.

METHOD OF AND MACHINE FOR FEEDING PAPER.

SPECIFICATION forming part of Letters Patent No. 519,341, dated May 8, 1894.

Application filed November 26, 1892. Serial No. 453,284. (No model.)

To all whom it may concern:

Be it known that I, ROBERT S. ODER, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Sheet-Registering Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in automatic paper sheet registering devices.

The object of my invention is to provide an automatic mechanism for taking a single sheet of paper which has been detached from the pile forward to the registering gages adapted to straighten the front edge of the sheet and providing mechanism automatically operated for drawing the said sheet to a side gage.

My invention further consists in providing a means by which the sheet is clamped without wrinkling or otherwise marring said sheet.

The further peculiarities of my invention are described hereinafter.

The accompanying drawings illustrating my invention show a portion of the mechanism and framework of a paper feeding device.

My invention is adapted to be used in connection with a ruling machine, printing press, or other machine to which are fed several sheets of paper which require to be properly registered on two sides.

The invention herein shown and described is particularly adapted to be used in connection with a paper feeder, of my invention, an application for a patent for which was made on even date herewith. As before stated, a portion of the mechanism and framework of the press feeder is shown in the accompanying drawings. However, in this application no claim is made on such construction.

In the accompanying drawings illustrative of my invention, similar figures of reference indicate similar parts.

Figure I represents a plan view of a machine constructed in accordance with the principles of my invention. Fig. II represents a front view. Fig. III represents a left side elevation. Fig. IV represents a right side elevation. Fig. V represents a view in vertical section taken on the dotted line X—Y, in the direction indicated by the arrow, Fig. I. Fig. VI represents a side view of the forwarding cords and rollers. Fig. VII represents a plan view of the parts shown in Fig. VI. Fig. VIII represents a side elevation of the side registering mechanism. Fig. IX represents a front elevation of the same. Fig. X represents a left side elevation of part of the sheet depressing mechanism. Fig. XI represents a plan view of the same. Fig. XII represents in front elevation the same. Fig. XIII represents a front elevation of a portion of the mechanism for rocking the shaft. Fig. XIV represents a left side elevation of the rocking mechanism. Fig. XV represents a plan view of the same. Fig. XVI represents a plan view of the sheet depressing mechanism and contiguous parts. Fig. XVII represents a plan view of the gripping mechanism. Fig. XVIII represents a view showing the paper in position between the gripper jaws. In this figure a portion of the plate 51 is broken away in order to better show the agitating disks 47 and 48, the fingers 60 and 62 are shown moved to one side so as to not obstruct the view of the agitating disks. The agitating disks 47 and 48 may be placed parallel upon the shaft 46 as shown in Fig. I, or as shown in this figure they may be placed at angles to one another. It is immaterial whether the fingers 60 and 62 are placed directly over the disks 47 and 48 as shown in Fig. I or a little to one side as shown in Fig. XVI.

Referring to the drawings, 1, 1, indicate substantially horizontal tie rods or bars, secured to a head 2, which is provided with a horizontal opening fitted to a transverse horizontal shaft 3 pivoted at each end in projecting brackets 4, secured respectively to the top corners of the sides 5, 5, of the framework of the paper feeder.

5, 5, indicate two parallel vertical plates which may either form the sides of the framework of the paper feeder or they may be used as independent supports for one end of the straightening device. Transversely mounted between the two plates 5, 5, and having bearings therein, is a horizontal shaft 6. Secured upon the left end of said shaft is a spur gear wheel 7, which meshes with a spur gear wheel 8, which is secured upon the left outer end of

a horizontal shaft 9, which is provided with bearings in the vertical plates 5, 5. Upon the right outer end of the shaft 9, is secured a pulley wheel 10, which is adapted to be connected by a driving belt with the pulley on the power shaft, or, if used with a printing press, the said belt would be connected with the driving shaft of the press. Secured upon the left outer end of the shaft 3, and revoluble therewith, is a spur gear 11, which meshes with the spur gear 7, from which it receives a rotary motion. Parallel to the shaft 3, and provided with bearings in brackets 4, at each end, is a revoluble shaft 12, located above and a little to the rear of shaft 3. Securely mounted upon the shafts 3, and 12, and revoluble therewith, are wooden rollers 13, and 14, respectively. Secured upon the right outer ends of shafts 3, and 12, and revoluble therewith, are spur gears 15, and 16, respectively. Blocks 17, are pivoted respectively upon the outer ends of the shaft 12. Rigidly secured to each of said blocks is a bar 18, which is movably mounted at its front end in a longitudinal opening of a head block or housing 19, which is mounted upon and rigidly secured to the front end of each of the bars 1. Each of the housings 19, is connected by a tie rod 20, extending transversely and horizontally between said head blocks, being rigidly secured at each end thereto. Transverse horizontal tie rods 21, and 22, are secured at their outer ends respectively to the blocks 2, and 17.

Upon each one of the bars 18, is mounted a movable housing 23, which is provided with a longitudinal opening fitting said bar 18. A tie rod 24, is mounted at each end in one of said housings 23, and rigidly secured thereto. A revoluble shaft 25, is movably mounted at each end in a horizontal opening in the housing 23. Rigidly secured upon said shaft 25, is a wooden roller 26. Mounted like belts upon the rollers 26, and 14, are longitudinal cords 27, best shown in Fig. VI.

Upon each one of the bars 1, is movably mounted a side frame 28. These side frames are rigidly secured together by means of transverse tie rods 29, and 30. The tie rod 29, is rigidly secured at each end to the front ends respectively of the side frames 28. The tie rod 30, parallel to the tie rod 29, is secured at each end to the rear ends respectively of the side frames 28. These side frames 28, and tie rods 29, and 30, provide a movable sliding framework which can be adjusted in any desired position upon the longitudinal bars 1.

A transverse revoluble shaft 31, is mounted in bearings located respectively in the front ends of the side frames 28. Securely mounted upon said shaft 31, is a wooden roller 32. A transverse horizontal revoluble shaft 33, is mounted at each end in bearings in the rear ends of the side frames 28, respectively. Securely mounted upon said shaft 33, is a transverse wooden roller 34. A housing or block 35, is provided with a longitudinal opening into which is fitted the bar 1, each of said bars 1 being provided with said housing 35. A tie rod 36, is rigidly secured at each end to the housings 35, respectively. Parallel to said tie rod 36, and mounted in horizontal openings in front of said tie rod in each of the housings 35, is a revoluble shaft 37, which has mounted upon it and revoluble therewith, a wooden roller 38. A series of cords 39, are passed around the wooden rollers 32, 34, 38, and 13, respectively, in the manner shown best in Figs. VI and VII, as follows:—beginning at the top of roller 32, passing around and below said roller toward the front, back upon the top of roller 34, downward around said roller and forward over the top of roller 38, around said roller and backward around the rear of roller 13, to the place of beginning, making a continuous loop. A transverse horizontal metallic plate 40, is rigidly secured at each end to one of the head blocks 19. In the upper surface of said plate 40, are cut two parallel grooves 41, and 42, best indicated in Figs. V and VIII. Partially covering for their full length each of the grooves 41, and 42, are parallel metallic plates 43, and 44, respectively, which are secured to the upper surface of the plate 40. A forwardly projecting arm 45, is rigidly secured near each end between bars 1, to the tie rod 29. Each forward end of said arm 45, is provided with an opening which serves as a bearing for a transverse revoluble horizontal shaft 46, upon which are rigidly secured eccentrically mounted disks 47, and 48, respectively, shown best in Fig. XVI. The said disks 47, and 48, are adapted during revolution to revolve in openings 49, and 50, in a transverse, forwardly sloping metallic plate 51, which is rigidly secured upon a rock shaft 52, which has bearings at each end in the front ends of the side frames 28. The said shaft 52, is parallel with and a little in front and below the shaft 31. Near each end of the shaft 52, and rigidly secured thereto, is an upwardly and rearwardly axtending arm or pin 53. Each of these said pins 53, is provided at its upper end with a transverse opening into which is fitted a transverse rod 54. A vertical screw-threaded opening extending downward to the transverse opening, is provided in the upper end of each of the pins 53. A set screw 55, is fitted into each of said openings and serves when tightened, to secure the transverse rod 54, in position. A pulley wheel 56, is rigidly secured upon and near the left end of the revoluble shaft 31. In a line horizontal therewith is a pulley wheel 57, rigidly secured upon the left outer end of the revoluble shaft 46. A belt 58, serves to communicate motion from pulley wheel 56, to 57. Rigidly secured by means of set screw or otherwise upon the rod 54, and nearly above the opening 49, is a collar 59, which has secured to it a downwardly projecting wire 60.

Secured upon the same rod in a similar manner, nearly over opening 50, on the plate 51, is a collar 61, provided with a downwardly projecting wire 62.

Secured upon the shaft 6, is a cam disk 63, which revolves between two friction rollers 64, revolubly mounted upon pins 65 respectively, which are secured in the lower end of a rock lever 66, which is pivoted near its center upon a point 67, rigidly secured to a projection 68, depending from a sleeve 69, secured by a set screw 70, upon the right end of a tie rod 71, which has its outer ends secured respectively to each of the brackets 4. The parts being described are best illustrated in Figs. XIV, and XV. The upper and front end of the pivoted lever 66, is bifurcated, each bifurcation being provided with an inwardly projecting pin 72, which operates in a groove of a sleeve 73, which is mounted movably, longitudinally and circumferentially upon the shaft 3. Said sleeve 73, has secured to it or is a part of an arm 74, which is provided at its front end with a transverse horizontal opening into which is fitted the right shouldered end of a sleeve 75, the outer shouldered end of said sleeve 75, being screw-threaded and provided with a nut 76, outside of the arm 74, securing it to the sleeve 75. Said sleeve 75, is mounted upon the tie rod 21, and is provided with a downward projection 77, which has pivoted to it at its lower end a connecting rod 78, which in turn is pivoted at its right end to a crank arm 79, projecting downward from and secured to a sleeve 80, which is mounted upon a rock shaft 81, and rigidly secured thereto by means of a set screw 82. The said rock shaft 81, is parallel to the right bar 1, and is pivoted at its rear end in the block 2, and at its front end in the right housing 19. Secured to the front end of said rock shaft 81, is a crank arm 83, which extends upward through an opening in a horizontal pin 84, and movable therein. The horizontal pin 84, is secured in an opening in a transverse rod 85, within which the pin 84, is movable. The said transverse rod 85, is parallel to and just above the tie rod 20, and is pivoted at each end in an opening in the upper end of each of the housings 19, and is longitudinally movable therein.

Secured to and near the right end of the rock shaft 52, is a curved cam 86, which is operated upon by a friction roller 87, mounted upon a pin 88, secured to the inner side of a sleeve 89, which is mounted upon the rock shaft 81, and longitudinally movable thereon. In the top of said rock shaft 81, as shown in Fig. XV, is a longitudinal groove 90, into which is fitted a projection from the inner surface of sleeve 89. These parts are best shown in Figs. X, XI, XII, XIV, XV, and XVI. A projecting plate 91, Fig. XV, is secured upon a block 92, provided with a longitudinal opening fitting the rock shaft 81, within which opening the rock shaft 81, is revoluble and also with a transverse opening into which is fitted the right end of rock shaft 52. A right angled plate 93, has its horizontal leg secured at one end to the block 92, and an opening in its vertical leg fitting the rock shaft 81. This right angled plate serves to hold the sleeve 89 in its position against the rear face of the block 92. The curved cam pin 86, extends through and above the rock shaft 52, into such a position as to strike against the projection 91, for the purpose of preventing the shaft 52, from rocking too far. A sleeve block 94, Figs. I, II, III, IV, and V, is provided with a longitudinal opening fitted one to each of the bars 1. A transverse tie rod 95, is secured at each end in openings in each of the sleeve blocks 94, respectively. A horizontal transverse board 96, is provided with two cleats 97^a, at its rear end which are bent over and around the tie rod 95, thus upholding the rear end of said board 96. The front end of said board is secured upon the under side by screws, or in any other manner, to the transverse metallic plate 40. The transverse plates 43, and 44, are so arranged as to be flush on their top surface with the top surface of the board 96. This board 96, and the said transverse plates 43, and 44, serve as a rest for the sheet of paper after it has been delivered thereto from the cords 39. A tie rod 97, parallel to and a little below the tie rod 20, is secured at either end to each of the housings 19, see Figs. VIII and IX. Mounted upon said tie rod 97, is a split sleeve 98, provided with downward projections 99, and 100. A clamping screw 101, passes through an opening in the projection 99, and engages a threaded opening in the projection 100. The projection 100, extends downward and is provided with a flange at its lower extremity fitting into the groove 42. Secured to said projection 100, is a right angled gage 102, against which the paper is brought by the registering mechanism. Upon a shouldered screw-threaded projection 103, on the projection 100, is mounted a friction roller 104, which is adapted to be struck by a pin 105, rearwardly extending from the inner end of a transverse rock lever 106. Said rock lever is pivoted at its center to a double sleeve 107. Said sleeve is mounted upon the transverse rods 20, and 85, two openings being provided for that purpose. The said double sleeve is movable upon the transverse rod 20, but it is rigidly secured to the transverse or reciprocating rod 85. The upper portion of the sleeve 107, or that portion which surrounds the rod 85, is split and the clamping screw 108, operating in and between the said split parts serves to secure the sleeve upon the rod 85. Two projections 109, and 110, extending from the front of the double sleeve 107, one being directly above the other, are provided with vertical openings within which is fitted a rod 111. Between the two projections 109, 110, and being a part of the rod 111, is a shoulder 112. Surrounding the

rod 111, and bearing one end upon the shoulder 112, the upper end upon the lower side of projection 109, is a coil spring 113, which serves to keep by its tension the rod 111, in its lowest position. Secured upon the rock lever 106, is an upwardly projecting plate 114, provided with bifurcated ends 115. Transversely through the bifurcated ends are openings into which is fitted at each end a pin 116, upon which is movably mounted a friction roller 117, which is adapted to strike against and force up against the pressure of the spring 113, the vertical rod 111, whenever the rock lever 106, is rocked past its center either way. This mechanism just described, simply serves as a releasable locking device for holding the rock lever 106, in a position into which it may be placed one side or the other from the center.

The same downward projection of the double sleeve 107, upon which the rock lever 106, is pivoted, has secured to its lowermost end a transverse, inverted U-shaped trough 118, between the sides or jaws of which operates for the purpose of clinching the sheet of paper and drawing it to the gage 102, a right-angle shaped wire 119, the vertical leg of which is rigidly secured to the left end of the rock lever 106. The horizontal leg or jaw is provided at its right end with a bent end 120, which engages the under side of the metallic plate 43, and is capable of being moved transversely along in the slot 41. This bent end 120, prevents the wire 119, from being withdrawn from the slot during the operation of gaging a sheet. A rearwardly projecting pin 121, is secured to the left end of the rock lever 106, directly above the point at which is secured the bent wire 119. This pin 121, and the pin 105, serve to strike, as the case may be, one or the other during the reciprocating motion of this part of the mechanism against the friction roller 104, thus rocking the lever 106, at such time.

Power being applied to the pulley wheel 10, and revolving it in an opposite direction to the movement of the hands of a clock, as viewed in Fig. IV, causes the shaft 9, together with the spur gear 8, to revolve in a similar direction thus causing the gear wheel 7, to revolve and through the intermediacy of the pinion 11, Fig. III, which meshes into gear wheel 7, causing a movement toward the left of shaft 3, as viewed in Figs. IV and V. The gear 15, being secured upon the shaft 3, revolves in the same direction and through its meshing with gear 16, causes it and the shaft 12, to which it is secured to revolve also, but in an opposite direction. The cords 27, serving as belts impart motion from the wooden roller 14, to the wooden roller 26, and also to the shaft 25, upon which said wooden roller is mounted. The cords 39, being connected as hereinbefore described, serve to impart the motion of the wooden roller 13, to the rollers 32, 34, and 38. The sheet of paper which has been detached from the pile by the paper feeding device or otherwise, and which it is desired to bring into proper register before being removed by the printing press, ruling machine or other machine, is fed in between the rollers 13, and 14, and is carried forward upon the cords 39, and under the cords 27, as indicated in Figs. VI and VII. The top cords 27, prevent the sheet from being blown off from the carrying cords 39. The sheet is carried by the cords 39, over the roller 32, and upon the board 96, and against the gages 122, which may either be a part of the press grippers or they may be L-shaped projections secured by one leg to and projecting forward from the front edge of the board 96, as illustrated in the drawings. Normally the sheet in being fed forward owing to the inclination of the board 96, will be carried by its momentum with the front edge against the gages 122. Means are provided, however, for agitating or shaking the rear part of the sheet so as to make certain its advancement against the gages, as follows:— The sliding carriage of which the side frames 28, mounted movably upon the bars 1, and the tie rods 29, and 30, form the body, is moved forward or backward upon the bars 1, into the position at which the rear end of the sheet rests upon the inclined tilting plate 51. As soon as the forward end of the sheet strikes against the gages 122, the plate 51, is tilted forward by mechanism, the operation of which will be afterward described and explained, permitting the sheet to rest upon the eccentrically mounted disks 47, and 48, which upon being revolved and being secured upon the shaft 46, at an inclination from the perpendicular of said shaft, as shown in Fig. XVI, cause the sheet to be given an agitating movement toward and against the gages 122. The roller 32, being secured upon the shaft 31, causes it to revolve, together with the pulley wheel 56, and through the intermediacy of the belt 58, and pulley wheel 57, imparts motion in the proper direction to the shaft 46, and eccentric disks 47, and 48, mounted thereon. The tilting motion imparted to the plate 51, is given it once during every single revolution of the gear wheels 7, and 8, said gear wheels being of a like size, as will now be described.

Referring to Figs. X, XI, XIII, XIV, XV, and XVI, the cam disk 63, secured upon the shaft 6, is so shaped as to impart, while rotating between the friction rollers 65, a reciprocating motion to the pivoted arm 66. It is also so shaped as to rock the said pivoted arm 66, backward and forward once for every revolution of the cam 63. The front or bifurcated end of the pivoted arm 66, in moving backward and forward, or rather, from side to side, causes through the intermediacy of the pins 72, engaging in the groove of the sleeve 73, a longitudinal motion of the said sleeve 73, upon the shaft 3. By means of the connection between the sleeve 73, and the

sleeve 75, through the intermediacy of the crank arm 74, a reciprocating motion of the sleeve 73, is imparted to said sleeve 75. The sleeve 75, in reciprocating upon the tie rod 21, causes a rocking motion to be imparted to the shaft 81, through the intermediacy of the connecting rod 78, which is pivoted to the projection 77, of the sleeve 75, at one end and at the other end to the crank arm 79, secured to the sleeve 80, which, in turn, is rigidly secured to the shaft 81. The rocking motion of the shaft 81, is imparted to the sleeve 89, which has a sliding keyed connection with the shaft 81. This rocking motion of the sleeve 89, is imparted to the pin 88, and roller 87, mounted thereon. During every downward movement of said roller 87, it strikes the curved cam pin, 86, which, being secured rigidly within the rock shaft 52, causes a rocking motion to said shaft 52, for every rocking motion of the shaft 81. The plate 51, being secured to said rock shaft 52, thus acquires its tilting or rocking motion up and down. The pins 53, being also secured to said rock shaft 52, also receive the same rocking motion, and carrying with them the rod 54, cause said rod together with the wires 60, and 62, to receive an upward and downward rocking motion for every corresponding rocking motion of the shaft 81. The sheet of paper having its rear end lying upon the said plate 51, and under the wires 60, and 62, is thus brought down against the eccentric disks 47 and 48, by which it is agitated. The sheet now being with its front edge against the forward gages 122, it is necessary to properly register it to bring its left side edge over to and against the gage 102. This is accomplished as follows:—The rocking motion of the rock shaft 81, Fig. XIV, is imparted to the rod 83, secured thereto. The rod 83, operating in the opening of the pin 84, which is revolubly mounted within an opening in the shaft 85, in its rocking motion causes a reciprocating motion longitudinally of said shaft 85. The split sleeve 98, is moved along upon the tie rod 97, to the position required by the width of the sheet. The clamping screw 101, is then tightened, securing the said sleeve 98, with its connected parts, rigidly in the desired position. The double sleeve 107, is now moved along upon the reciprocating shaft 85, and tie rod 20, into the proper position required by the location of the sleeve 98, upon the tie rod 97. The clamping screw 108, is then tightened, securing the double sleeve 107, upon the reciprocating shaft 85. It is now evident that with every reciprocation of the shaft 85, a similar reciprocation will be communicated to the double sleeve 107. The location of the double sleeve 107, upon the shaft 85, is such that the roller 104, will be located between the pins 105, and 121, and also in such a position that the pins 105, and 121, will be struck in turn by the friction roller 104, during each reciprocation and thus impart a rocking motion to the pivoted lever 106. As the shaft 85, moves toward the right, as viewed while facing the machine, the double sleeve 107, together with its attached mechanism, is also carried to the right, or toward the left side of the sheet of paper as it lies with its front edge against the gages 122. The position of the gripping mechanism at this time will be that shown in Figs. IX and II. As the said reciprocating shaft 85, and attached double collar 107, approaches the sheet, the trough 118, passes over the top of said sheet and the bent wire 119, passes below the sheet. The said collar 107, and shaft 85, continue to advance toward the sheet until the pin 121, strikes against the roller 104. When this is done the roller 104, forces the left end of the rock lever 106, upward, drawing up the left end of the bent wire 119, and causing the horizontal portion of the wire 119, to grip the paper between the vertical sides of the trough 118. The mechanism is so timed as to now cause the rock shaft 81, through the intermediacy of the pins 83, and 84, to force toward the left the reciprocating shaft 85, which carries with it the gripping mechanism and double sleeve 107. The sheet of paper held between the sides of the trough 118, and the wire 119, is also carried to the left until it strikes against the stationary side gage 102. The said side gage 102, holds the paper from further advancement in that direction and causes it to slip from between the wire 119, and the sides of the trough 118. The sheet of paper is thus left with the front and one side edge in proper register to be seized and withdrawn by the press or ruling machine grippers. As the shaft 85, and double sleeve 107, and attached parts are carried toward the left, the pin 105, strikes against and near the top of roller 104, and is forced by it upward, rocking that end of the pivoted lever 106, upward and depressing the other end of the pivoted lever, together with the left end of the bent wire 119, causing said wire 119, to emerge in its horizontal portion from between the sides of the trough 118, into the position indicated in Fig. IX. The horizontal portion being now below the top surface of plate 43, and the gripping mechanism being again in position to seize the next sheet, the releasable locking mechanism shown in Figs. VIII and IX, operates as follows:—Whenever the rock lever 106, is rocked from left to right or right to left, the roller 117, striking against the lower end of pin 111, forces it up against the pressure of the spring 113, until said roller has passed the vertical rod 111, at which time said rod is forced back by the spiral spring and prevents the roller 117, from moving out of the position last assumed, until one of the pins 121, 105, is forced against the roller 104.

It will be noted that in the manner in which I have arranged the cords 39, around the rollers 32, 34, 38, and 13, the sliding carriage carrying rollers 32, and 34, may be moved for

a considerable distance either way upon the guide bars 1, without altering the length of or changing the cords 39. This arrangement of the cords permits the carriage to be moved upon the bars 1, into a position suitable for any length of paper. It will also be noted that the side gage 102, and the side gripping mechanism, can be moved transversely over the table 96, to accommodate any width of paper.

I will now give a brief *résumé* of the operation of my invention:—The mechanism is imparted motion, as hereinbefore described. The sheet which is to be registered passes between the rollers 13, and 14, under the cords 27, and upon the cords 39, by which it is carried forward over the roller 32, upon the board 96, and against the front gages 122, with its rear end resting upon the plate 51, which now lowers, together with the wire 60, 62, pressing the sheet upon the top of the eccentrically mounted revolving rollers 47, and 48, by which it is certainly forced against both of the front gages 122. At this time the gripping mechanism advances and operates upon the left side of the sheet seizing the sheet and drawing it toward the left against the side gage 102, against which it remains. The gripping mechanism afterward is automatically reset into a position for engaging the sheet following. At this time the registered sheet is removed another sheet being now upon the cords 39, and being advanced toward the front gages 122. The mechanism is so timed that one complete operation is performed by each part for every sheet that is registered.

It will be observed that the front end of the machine may be raised or lowered to any desirable angle so as to accommodate the machine to any height of press or ruling machine with which the straightening mechanism is connected. The construction of the parts is such that the framework of the machine may be rocked upward or downward upon its pivoted connections with the shafts 3, and 12, into any position without disturbing the operation of the working parts.

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

1. In paper registering, the method of registering a sheet which consists in advancing the front edge of the sheet toward a given point, secondly, communicating an agitating motion to the sheet, and thirdly, giving the sheet a sidewise motion toward another given point, substantially as described.

2. In sheet registering machines, a carrying belt or a series of carrying belts upon which the sheet lies, a gage against which the front edge of the sheet is brought, means for imparting an agitating motion to the sheet, means for taking the sheet to a side gage, and means for suitably timing said operations substantially as described.

3. In sheet registering machines, the combination with means for forwarding the sheet against a front gage, of means for imparting an agitating motion to said sheet, means for taking the sheet to a side gage, and means for suitably timing the said operations, substantially as described.

4. In sheet registering machines, the combination with means for carrying the sheet against the front gage, a reciprocating gripping mechanism for taking the sheet to a side gage, means for imparting an agitating motion to the sheet, and means for suitably timing the said operation, substantially as described.

5. In a sheet registering machine, the combination with the carrying belt or a series of belts upon which the sheet rests, with means for operating said belt or belts, the gage against which the front edge of the sheet is brought, a reciprocating gripping mechanism for carrying the sheet against the side gage, means for imparting an agitating motion to the sheet, and means for suitably timing the said operation, substantially as described.

6. In a sheet gripping device, the combination with a U-shaped jaw operating upon one side of the sheet, of a jaw operating upon the other side of the sheet, and between the arms of the U-shaped jaw, and means for closing and opening said jaws, substantially as described.

7. In a sheet gripping device, the combination with a reciprocating carriage provided with a suitable means of support, of a U-shaped jaw connected to said carriage and operating upon one side of the sheet, of a jaw also carried by said carriage and operating upon the other side of the sheet, and between the arms of the U-shaped jaw, and means for opening and closing said jaws, substantially as described.

8. In sheet registering machines, the combination with means for carrying the sheet forward against a gage or stop, of a suitable propelling means, a reciprocating carriage carrying a U-shaped jaw operating upon one side of the sheet, of a jaw also carried by said carriage, and operating upon the other side of the sheet, means for opening and closing the one jaw between the arms of the other, and a side gage for forcing the sheet from between the jaws, substantially as described.

9. In sheet registering machines, the combination with means for carrying the sheet forward against a gage or stop, of means for agitating the sheet, a reciprocating carriage, a U-shaped jaw connected to said carriage and operating upon one side of the sheet, a jaw also carried by said carriage and operating upon the other side of the sheet, means for opening and closing the jaws and a side gage for forcing the sheet from between the jaws, substantially as described.

10. In sheet registering machines, the com-

bination with a carrying belt or a series of belts, of means for imparting motion to said belt or belts, a gage against which the front edge of the sheet is brought, a reciprocating carriage, a U-shaped jaw carried by said carriage and operating upon one side of the sheet, a jaw also carried by said carriage and operating upon the other side of the sheet, means for opening and closing the jaws and a side gage for forcing the sheet from between said jaws, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT S. ODER.

Witnesses:
A. MIDDLESWORTH,
ED. S. ARMITAGE.