

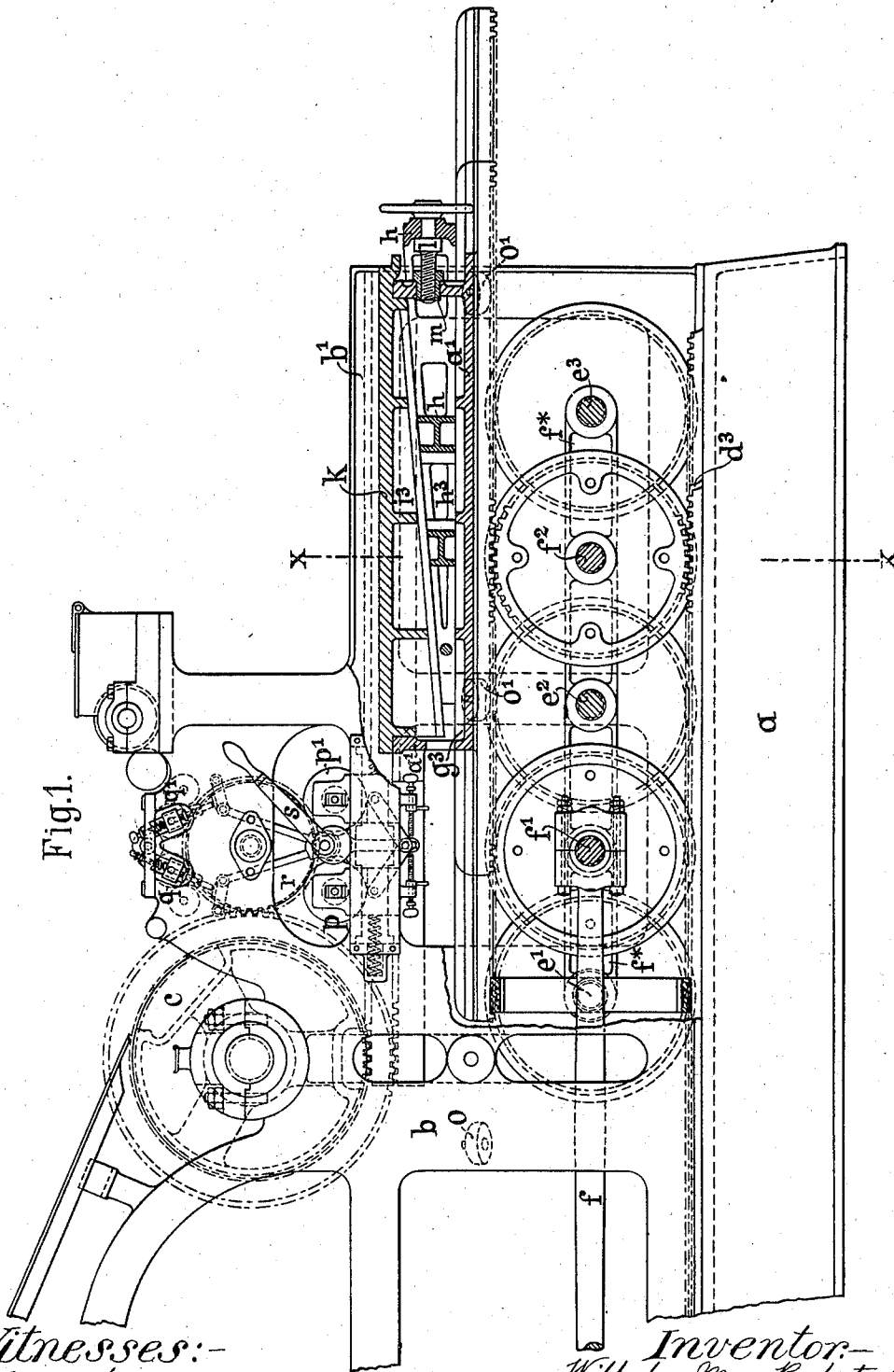
(No Model.)

8 Sheets—Sheet 1.

W. M. ROCKSTROH.
PRINTING MACHINE.

No. 577,584.

Patented Feb. 23, 1897.



Witnesses:-

Ernst Hays
George Barry Jr

Inventor:-

Wilhelm Max Rockstroh
by attorneys *Brown & Leonard*

(No Model.)

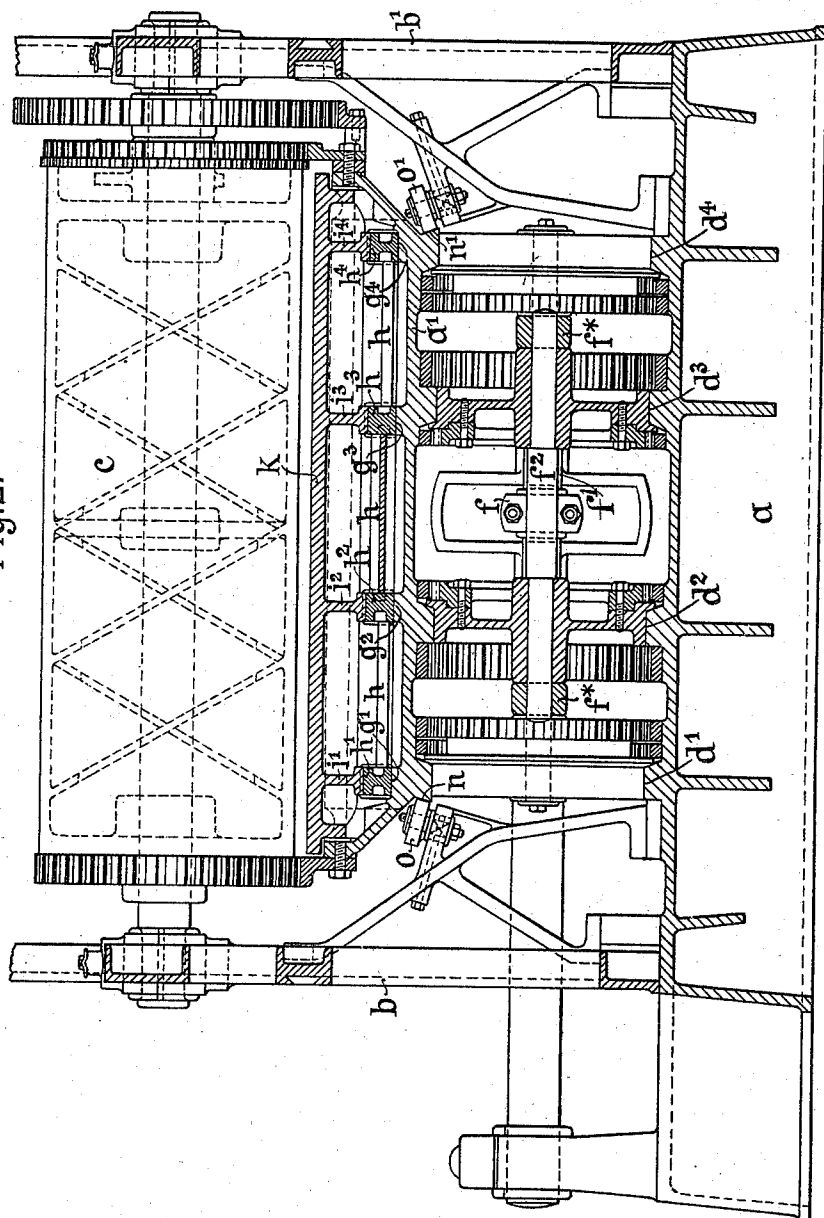
8 Sheets—Sheet 2.

W. M. ROCKSTROH.
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Patented Feb. 23, 1897.

Fig. 2.



Witnesses:—
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(No Model.)

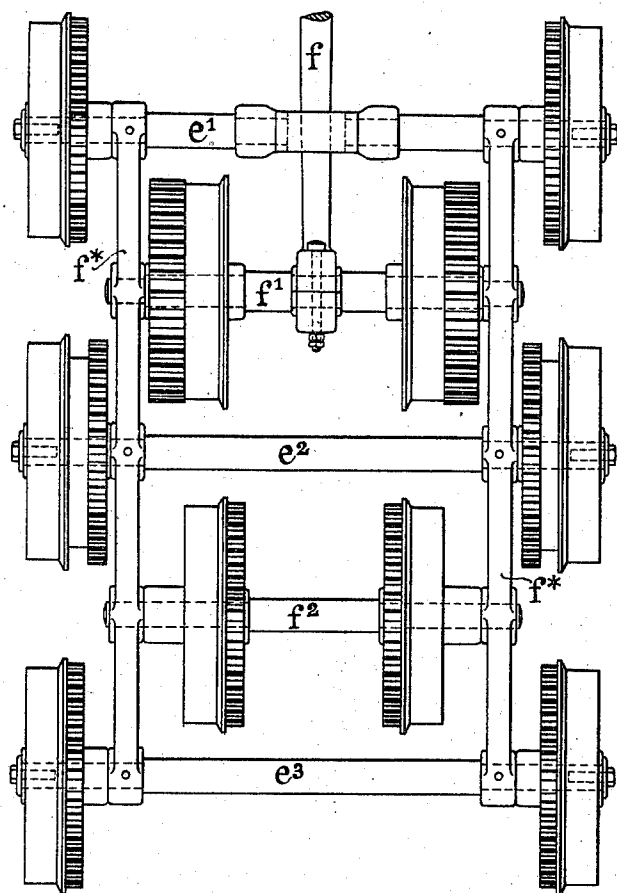
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Patented Feb. 23, 1897.

Fig.3.



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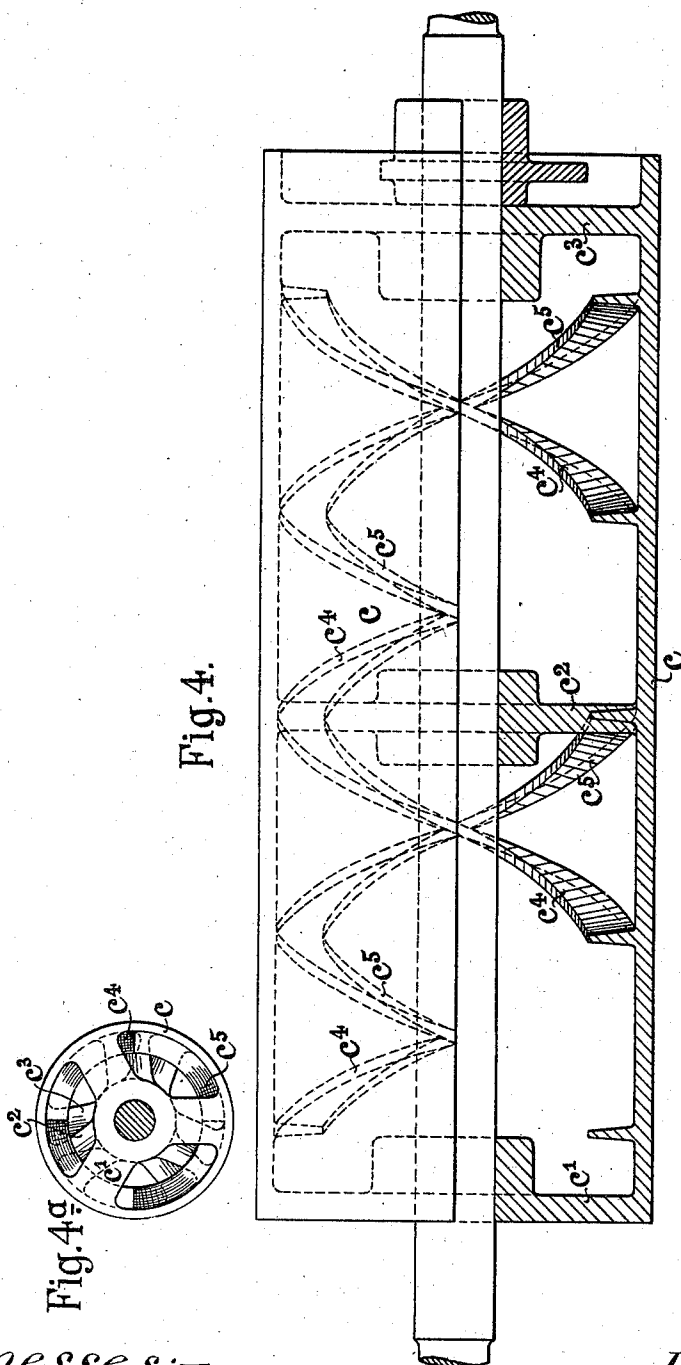
(No Model.)

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W. M. ROCKSTROH.
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Witnesses:—
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(No Model.)

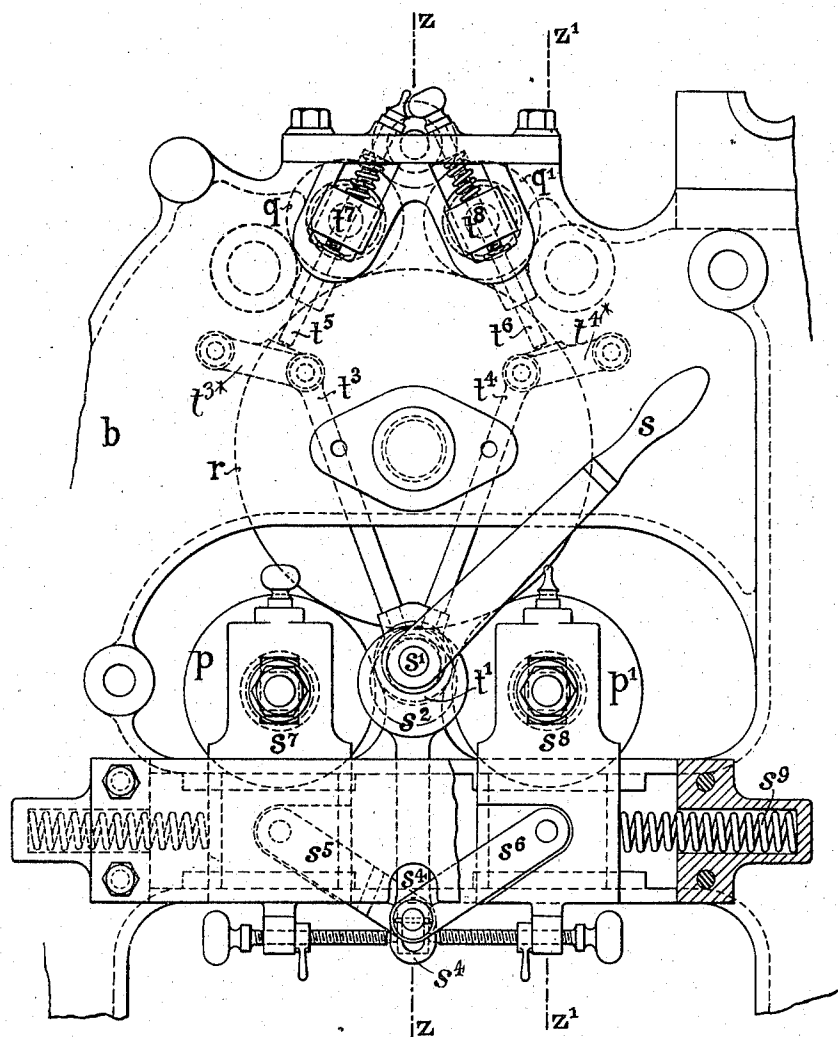
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W. M. ROCKSTROH.
PRINTING MACHINE.

No. 577,584.

Patented Feb. 23, 1897.

Fig. 5.



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(No Model.)

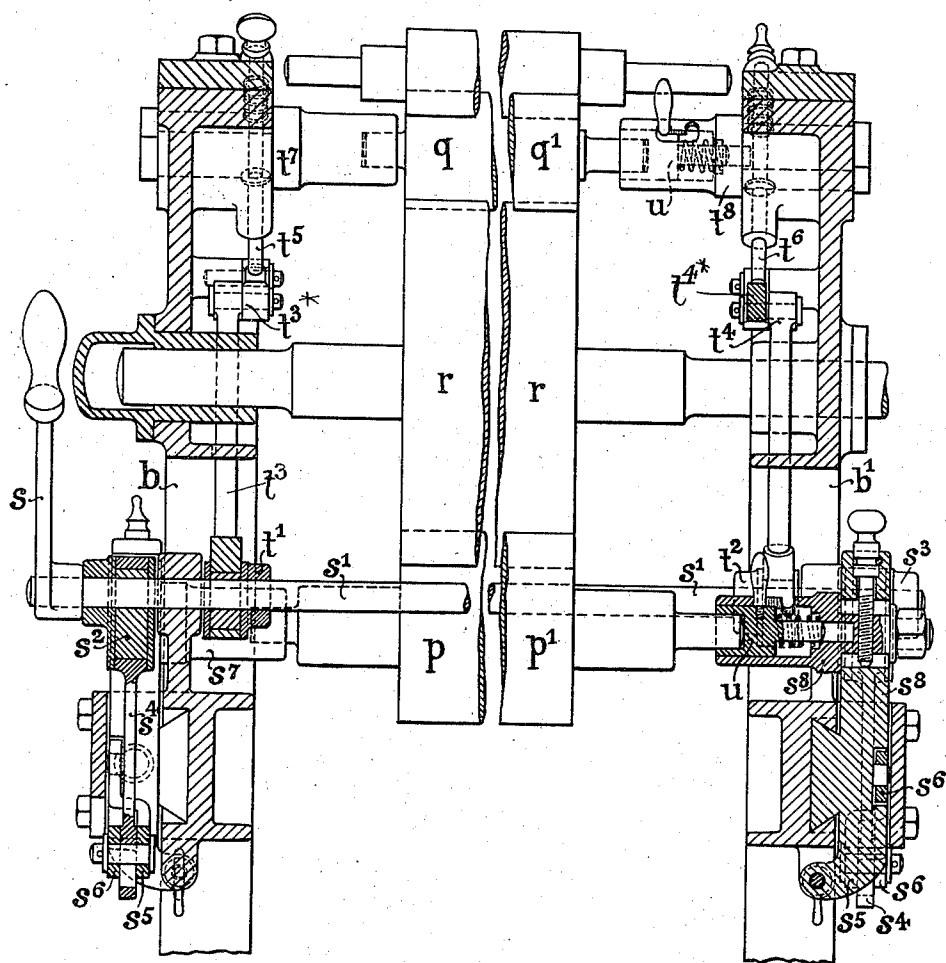
W. M. ROCKSTROH.
PRINTING MACHINE.

8 Sheets—Sheet 6.

No. 577,584.

Patented Feb. 23, 1897.

Fig.6.



Witnesses:-

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(No Model.)

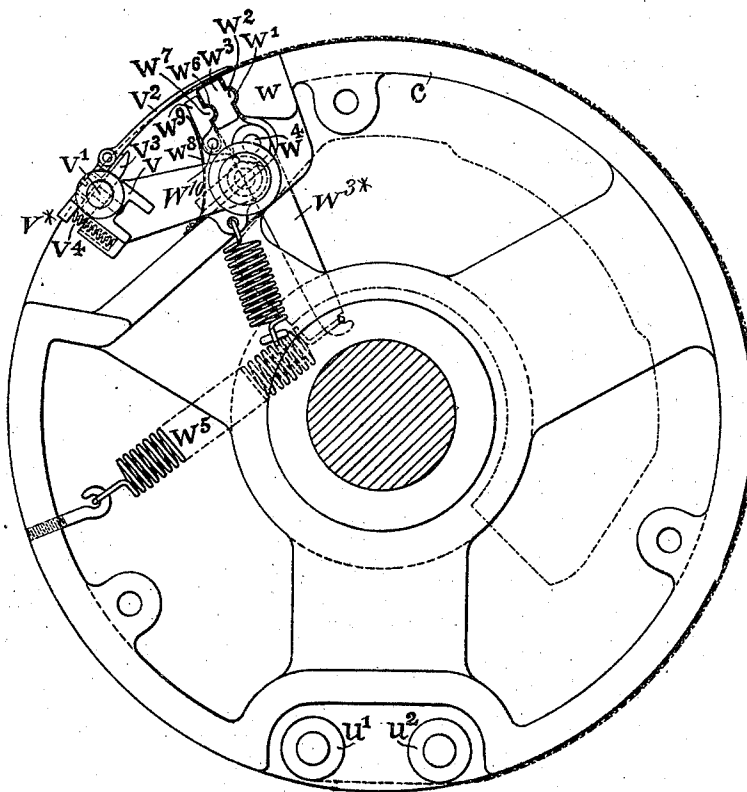
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PRINTING MACHINE.

8 Sheets—Sheet 7

No. 577,584.

Patented Feb. 23, 1897.

Fig. 7.



Witnesses:-
Fred Hagner
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(No Model.)

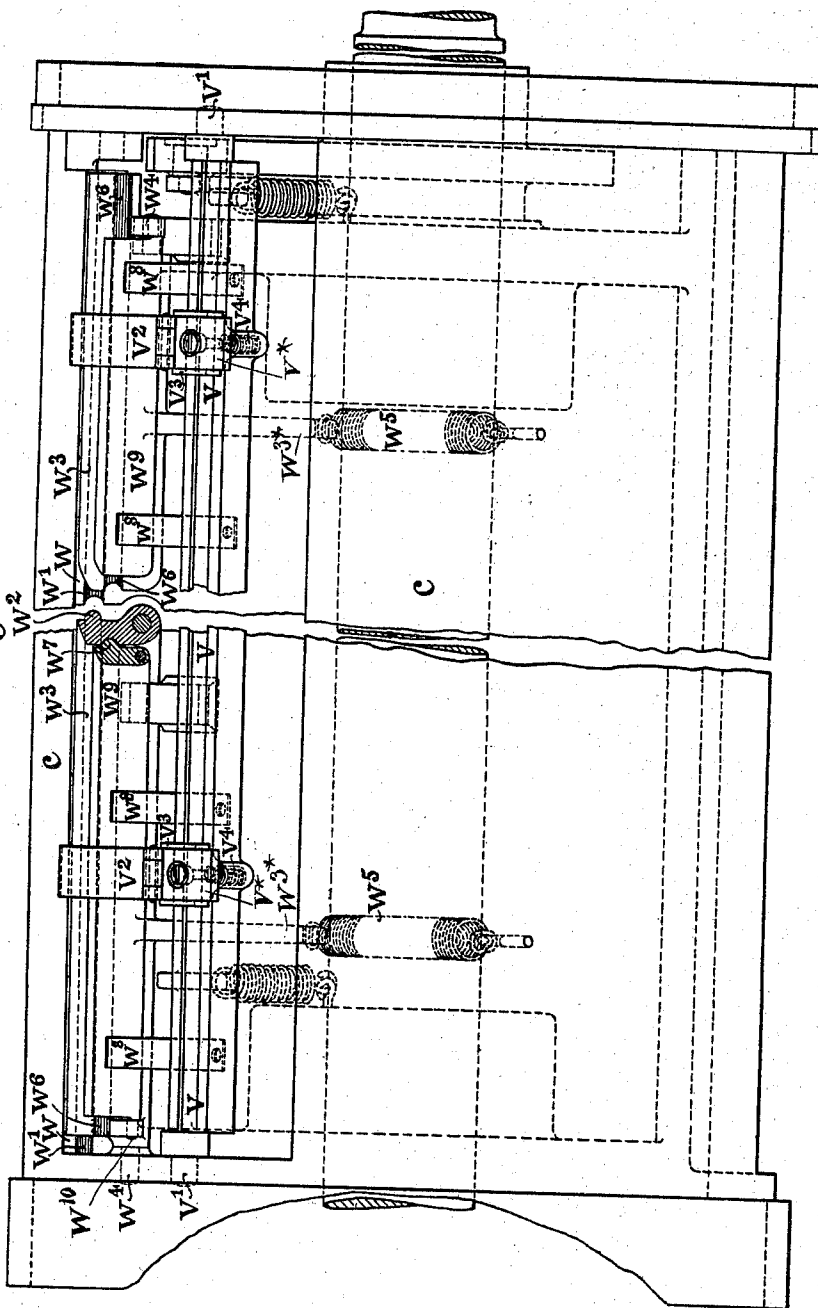
W. M. ROCKSTROH.
PRINTING MACHINE.

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No. 577,584.

Patented Feb. 23, 1897.

Fig. 8.



Witnesses:-
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UNITED STATES PATENT OFFICE.

WILHELM MAX ROCKSTROH, OF PLAUEN, GERMANY.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 577,584, dated February 23, 1897.

Application filed February 14, 1896. Serial No. 579,267. (No model.)

To all whom it may concern:

Be it known that I, WILHELM MAX ROCKSTROH, mechanical engineer, of No. 12 Grenzstrasse, Plauen, near Dresden, Germany, have invented a new and useful Improvement in Printing-Machines, of which the following is a specification.

It is of essential importance in printing-machines that the adjustment of the parts that coöperate in the formation of the impression should be most exact and correct and that this exact adjustment should not be injured by the yielding or springing of the said parts. The parts chiefly concerned are the cylinder and the bed, for the relative adjustment of which the bearings of the cylinder have been made adjustable, the bed being made unadjustable; also, a bed-adjusting arrangement has been combined with the cylinder-adjusting arrangement.

According to the present invention there are combined in a printing-machine arrangements which enable the most exact and correct mutual adjustment of the working parts to be effected in a very simple manner, and also secure that these parts shall be mutually unyielding and unalterable. By this means not only are speed and certainty of action secured to an extraordinary extent in the operation of the machine, but the exactness and beauty of the printing is increased to an important degree. The object desired is attained, according to this invention, by the combination of a cylinder carried by stationary bearings, and consequently unadjustable, a form-bed with form adjustable parallel to itself and consequently to the cylinder, and a considerably-increased support for the reciprocating form in its longitudinal and lateral directions, with lateral guiding devices for preventing deviations of movement on the part of the box carrying the form. As is well known, the adjustment of the cylinder in its two bearings to its proper position relatively to the form has hitherto been one of the most important tasks of the foreman or other person in charge of the machine, as on this adjustment depends the exact working of the machine. The accuracy of this adjustment depends, however, on the skill of the said foreman or other person, and rests very often more on experiment than on the safer manip-

ulation of mechanism provided for the purpose. Any inaccuracy in the adjustment is immediately visible in the printing and will necessitate correction. To obviate these objections, cylinder-adjusting devices are dispensed with in a printing-machine according to this invention, the cylinder being arranged in immovable bearings.

In order to prevent any yielding of the cylinder whatever over the whole width thereof, it is provided internally with a number of arms or cross-shaped frames, which are displaced relatively to one another, and also with helical ribs that cross one another, so that a rigid cylinder-surface is produced that will not yield at any point.

As a further consequence of the mounting of the cylinder in stationary bearings any necessity for altering the diameter of the cylinder by increasing the thickness of the blanket thereon, as heretofore usual, is avoided, so that the position of the cylinder and its peripheral speed remain constant. The mounting of the cylinder in stationary bearings also possesses the substantial advantage that, on account of its unalterable position as regards height, there is always the same depth of engagement of its toothed ring with the racks that rotate it, and which are located on the form-carrying box, which always remains at the same height. There is thus avoided the irregularity in the gearing that is always a consequence of any alteration of the height of the cylinder.

The bed carrying the form used in combination with a cylinder mounted in stationary bearings, as described, rests by means of ribs, which are wedge-shaped in the longitudinal direction, on a frame which is provided with corresponding wedges and is situated so as to be capable of sliding on the form-box mounted on the carriage. The adjustable bed is prevented from shifting horizontally and can only be raised and lowered. The sliding frame is provided with a screw that is capable of being rotated by an adjusting-wheel, but which cannot move endwise relatively to the frame and which engages in a nut fixed to the aforesaid form-carrying box. By this arrangement the form can be shifted parallel to itself in accordance with the divisions of a scale, so that it can be adjusted in height,

and consequently in relation to the periphery of the cylinder, with the utmost accuracy, certainty, and quickness. The points of support of the bed may be as numerous as desired in the direction of the breadth of the bed. It is desirable that the bed should be supported in such a manner that the supporting or shifting places should be directly above the supporting or bearing lines formed by the rows of carriage-wheels, which are arranged one behind another below the aforesaid box.

In printing-machines as heretofore constructed there has been arranged a track or traveling way on which the carriage, with its two rows of wheels, runs after the manner of railway-vehicles. The support of the form was in this arrangement of the machine restricted in the longitudinal direction to the necessary distance apart of the carriage-axles, that is, to the wheel-base, and in the direction of its breadth to the breadth of the single track provided. This is, however, recognized as inadequate. The arrangement is supplemented in a machine according to this invention by a second traveling way or track, whereby the support of the form in the direction of the width of the machine is increased fourfold, while an important closing up or contraction of the supporting-lines in the longitudinal direction of the machine is effected by the distribution or displacement between the wheels of the first traveling way of the wheels that roll on the second traveling way. In addition to this very much increased support of the form provision is made against its shifting laterally and upwardly by means of a prismatic guidance of the box, there being arranged for this purpose at the sides of the box outwardly and downwardly inclined surfaces located between adjustable rollers.

By the combined arrangement hereinbefore set forth a stiffening, which extends from the base-frame upward, is produced, due to the increase of the number and the decrease of the distance apart of the axles in the longitudinal direction of the machine, to the increase of the number and the displacement relatively to one another of the wheels in the direction of the width of the machine, to the mounting on these multiplied supporting-points of the form-foundation and the supporting thereon of the form, and to the mounting of the cylinder, which is itself stiffened, in stationary bearings. Between these several parts only the bed with the form is capable of being very slightly adjusted as regards height, with its firm support nevertheless maintained, the bed and form being secured against any lateral deviation and any improper upward motion by the prismatic-roller guidance of the box.

The accompanying drawings represent a printing-machine constructed according to this invention.

Figure 1 is a side elevation of the machine with the foundation-box, the adjustable wedge-frame mounted thereon, and the form-

bed resting on the wedge-frame, in section. Fig. 2 is a cross-section on the line xx of Fig. 1. Fig. 3 shows the arrangement of the carriage-wheels in plan. Fig. 4 is a view of the printing-cylinder, half in elevation and half in section. Fig. 4^a is an end view of the cylinder to a smaller scale, showing the means employed for strengthening it. Fig. 5 is a side view of the inking apparatus. Fig. 6 is a transverse sectional view of the same. Fig. 7 is an end view of the cylinder, showing the gripper arrangement and blanket-clamping attachment. Fig. 8 represents a front view of the cylinder corresponding with Fig. 7, partly in section.

From the bed a of the machine rises the side frames $b b'$, carrying fixed bearings in which the cylinder c is mounted to rotate. On the bed a there are formed or arranged four ways $d' d^2 d^3 d^4$. On the outer ways $d' d^4$ run the wheels of the axles $e' e^2 e^3$, and on the inner ones—viz., $d^2 d^3$ —the wheels of the axles $f' f^2$. With one of the latter axles there engages the driving-rod f , by means of which the carriage comprising the frame f^2 and the wheels and axles connected thereto are caused to move to and fro. The inner wheels are so arranged with regard to the outer ones that there are only the smallest practicable distances between the wheel-axles $e' f' e^2 f^2 e^3$, while there are at the same time only short distances between the places where support is afforded in the breadth of the form by the four rows of wheels. All the wheels are provided with rings of teeth in gear with racks fixed to the bed a and to the form-carrying box a' . This box a' , which bears on the carriage below, as shown, is provided over each row of wheels with longitudinal rails or ways $g' g^2 g^3 g^4$, on which wedges $h' h^2 h^3 h^4$, which are connected together to form a frame h , Fig. 1, rest and can slide, while on these wedges rest the oppositely-arranged wedges $i' i^2 i^3 i^4$ of the bed k , which carries the form. (Not shown.)

The frame h is provided with an adjusting-screw l , which is so mounted that it can be rotated, but cannot move endwise relatively to the frame, and which enters a nut m , fixed on the box a' , the arrangement being such that by rotating the screw, by means of the hand-wheel thereon, the frame h can be screwed in or out, whereby the bed k and with it the form resting thereon can be accurately, easily, securely, and quickly brought, in accordance with a suitable scale, to the desired position as regards height in relation to the cylinder c . The box a' has at nn' downwardly and outwardly inclined surfaces, against which rollers $o o'$, which are adjustable in the machine-frame, lie and form a prismatic guide, which prevents the box from moving laterally or rising.

The cylinder c , Figs. 4 and 4^a, is provided internally with cross-arms $c' c^2 c^3$, which are displaced relatively to one another, and with helical strengthening-ribs c^4 and c^5 , which cross each other, as shown.

The endeavor to reduce the adjustment of the machine to the smallest amount and to the least number of adjusting devices is completed by a disengaging arrangement which is provided for the purpose of removing the inking-rollers and distributing-rollers from the ink-transferring cylinder represented in side elevation in Fig. 5 and in cross-sectional elevation in Fig. 6 and by a gripper arrangement and blanket-clamping arrangement represented in end view in Fig. 7 and in side elevation, partly in section, in Fig. 8. The left and right hand portions of Fig. 6 are sections on the lines zz and $z'z'$, respectively, of Fig. 5.

It is important that both the inking-rollers $p p'$, which transfer the ink to the form, and also the distributing-rollers $q q'$, to which the ink is transferred from the ink-box, should be capable of being moved away from the large ink-cylinder r , that lies between these pairs of rollers, when the machine is to stand still for any length of time, for the resting-lines formed between the past rollers and the iron cylinder when the machine is allowed to rest for a time are injurious to good contact-surfaces. To enable this moving away of the whole of the rollers from the cylinder r to be effected quickly and easily by the rotation of a single part, the following arrangement is provided: On a shaft s' , on which is a lever s , there are arranged two eccentrics $s^2 s^3$, the straps of which are connected by links s^4 and links $s^5 s^6$, that form toggles with the bearings $s^7 s^8$ of the inking-rollers $p p'$, which bearings are located in horizontal sliding ways. By turning over the lever s the links $s^5 s^6$ are raised and push the bearings $s^7 s^8$ away from each other in opposition to the pressure of springs s^9 , which, when engagement is to be effected by the turning back of the lever s , carry the bearings with the rollers back into the working position. Likewise, by turning the lever s , eccentrics $t' t^2$, also fixed on the shafts s' , are rotated, and the rods $t^3 t^4$ of said eccentrics are caused to raise levers $t^{3*} t^{4*}$ and cause bolts $t^5 t^6$ to press with their heads against the ends of the adjusting-screws of the bearings $t^7 t^8$ of the rollers $q q'$ and thereby so raise the bearings that the rubbing-rollers $q q'$ are lifted off the cylinder r . The bearings $t^7 t^8$ can also slide back under spring-pressure into their working positions upon the lever s being turned back. There is provided for the said rollers $p p'$ and $q q'$ a bearing arrangement which is shown in the right-hand side of Fig. 6 and according to which the bearings s^8 and t^8 consist of bolts u , that are capable of being slid back and are provided with bearing-boxes and which can be pushed back against spring-pressure into cases to enable the ends of the roller-axes to be readily removed from the bearings.

The grippers and clamping-in arrangement for the blanket on the cylinder (shown in end view in Fig. 7 and in longitudinal view

in Fig. 8) are to be considered as essential auxiliaries in this printing-machine for preventing the machine foreman from neglecting the machine.

As to the grippers it is well known that the machine foreman has often to adjust the grippers, which is done by striking them so as to make them act correctly and all grip each sheet of paper exactly when the same is fed thereto. Now any adjustment is obviated by the gripper arrangement now to be described, an essential feature of which is that the axis of rotation of the gripper-bar is arranged as near as possible to the periphery of the cylinder, and each gripper is independently rotatably mounted, the end of the gripper that projects backwardly with regard to this axis of rotation being subject to spring-pressure in order always to press the fore end of the gripper down upon the cylinder, so as to secure a proper grip.

In the recess in the periphery of the cylinder shown in Fig. 7 there is arranged, with its pivots v' as far out as possible, the bar v , that carries the grippers v^2 and which extends from end to end of the cylinder. The periodical rotation of this bar for operating the grippers v^2 takes place in a known manner through the action of cam-surfaces and spring-pressure, the grippers v^2 being rotatably mounted in small brackets v^3 on the bar v . Each gripper has, as usual, a long free end for gripping the sheet. It is, however, lengthened backward in the form of an arm v^* beyond the axis of rotation on the bracket v^3 , and this end is subject to the pressure of a spring v^4 provided under it. From this arrangement it follows that the gripper, besides possessing the ordinary motion for seizing a sheet, (which movement when the drag-bar is moved acts as near as possible to the periphery of the cylinder in such a manner that the gripper never moves the sheet, but always comes down upon it from above,) acts under all circumstances with additional gripping by reason of the spring-pressure and thus requires no further help or adjustment by the machine foreman. In the aforesaid recess of the cylinder c are also situated the clamping devices for the blanket, which, since the cylinder is constructed and mounted as hereinbefore described and subject to no displacement in height and very seldom requires enlarging, will generally only require to be single. The clamping arrangement is a double one, one part being for the ordinary blanket and the other for the covering oil-sheet.

The face of the stationary jaw w is formed with a groove w' , in which can engage the semicylindrical rib w^2 of the jaw w^3 , which is pivoted on the axle w^4 and is subject to the pull of the springs w^5 , fastened to the lower ends of arms w^{3*} , connected with the said jaw w^3 . The rib w^2 clamps fast the ends of the blanket inserted in the groove w' of the jaw w . The springs w^5 permit the jaw w^3 to be moved away from the jaw w far enough to

permit the introduction of the end of the blanket between the said jaws, after which on releasing the jaw w^3 the spring will close it upon the blanket and effect the clamping of the latter. The jaw w^3 has also a groove w^6 in its back, in which engages the rib w^7 of a jaw w^9 , which works on a pivot w^{10} and is subject to the pressure of a spring w^8 . The rib w^7 clamps fast the end of the oil-sheet inserted in the hollow channel w^6 . In this way the insertion of the blanket is greatly facilitated and the secure holding thereof insured. The tightening up of the blankets upon the surface of the cylinder is effected on the opposite side of the cylinder by means of the ordinary round bars $u' u^2$, provided with check action.

The above-mentioned movement of the jaw w^3 to permit the introduction of the blanket may be effected by prying back the said jaw with a suitable instrument inserted between it and the jaw w at their ends which project beyond the edges of the blanket or by the pressman applying his hands to the arms w^{3*} through openings in the ends of the cylinder. The corresponding movement of the jaw w^9 to permit the introduction of the oil-sheet is to be effected by prying it back from the jaw w^3 in the same way as described with reference to the movement of the latter.

What I claim as my invention is—

1. In a printing-machine, the combination of a printing-cylinder and stationary bearings therefor, a reciprocating form-box and prismatic guides therefor whereby it is prevented both from rising and from moving sidewise, a form-bed adjustable in said box toward and from the cylinder in parallel relation to itself and to the cylinder, means substantially as described for effecting such adjustment, a carriage for such form-box, a fixed foundation and three or more fixed supporting-ways for said carriage, wheels under said carriage for running on the several ways, the axles of said wheels rolling on the different ways being arranged as near as practicable to each other and those on each way being arranged between those on the next way so that the form is supported in the direction of its length and breadth at many places by the founda-

tion and the carriage, substantially as herein set forth.

2. The combination of a form-box, a carriage for said form-box, three or more fixed ways for said carriage, wheels for said carriage running on said fixed ways those wheels on each way being arranged between those on the next way, and an impression-cylinder having internal helical strengthening-ribs crossing each other, all substantially as herein described.

3. The combination with a printing-machine cylinder, of a rotatable gripper-bar v pivoted to the cylinder near the periphery thereof, brackets v^3 on the said bar, grippers v^2 independently pivoted to said bar and prolonged backward beyond their pivots, and springs applied to the backward prolongations of the several grippers for pressing them upon the sheet, substantially as herein described.

4. The combination with a printing-machine cylinder, of blanket-clamping devices consisting of a fixed jaw and a spring-pressed pivoted jaw provided with a groove and a rib that engage with each other for receiving the blanket ends, and a spring-pressed clamping-jaw pivoted to the back of the first-named pivoted jaw and engaging therewith by grooves and ribs for receiving the ends of the oiled sheet, all substantially as herein described.

5. In a printing-machine of the kind herein described wherein the distributing-rollers which are in rolling contact with the large ink-cylinder when the machine is in use, the combination with the said rollers of separate movable bearings therefor, springs applied to said bearings to press the several rollers toward the said cylinder, a lever common to all of said bearings and mechanism substantially as herein described intermediate of said lever and bearings for withdrawing the several rollers at one time from contact with the cylinder, as herein described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

WILHELM MAX ROCKSTROH.

Witnesses:

MARTIN KÖRNER,

WILHELM WIESENHÜTTER.