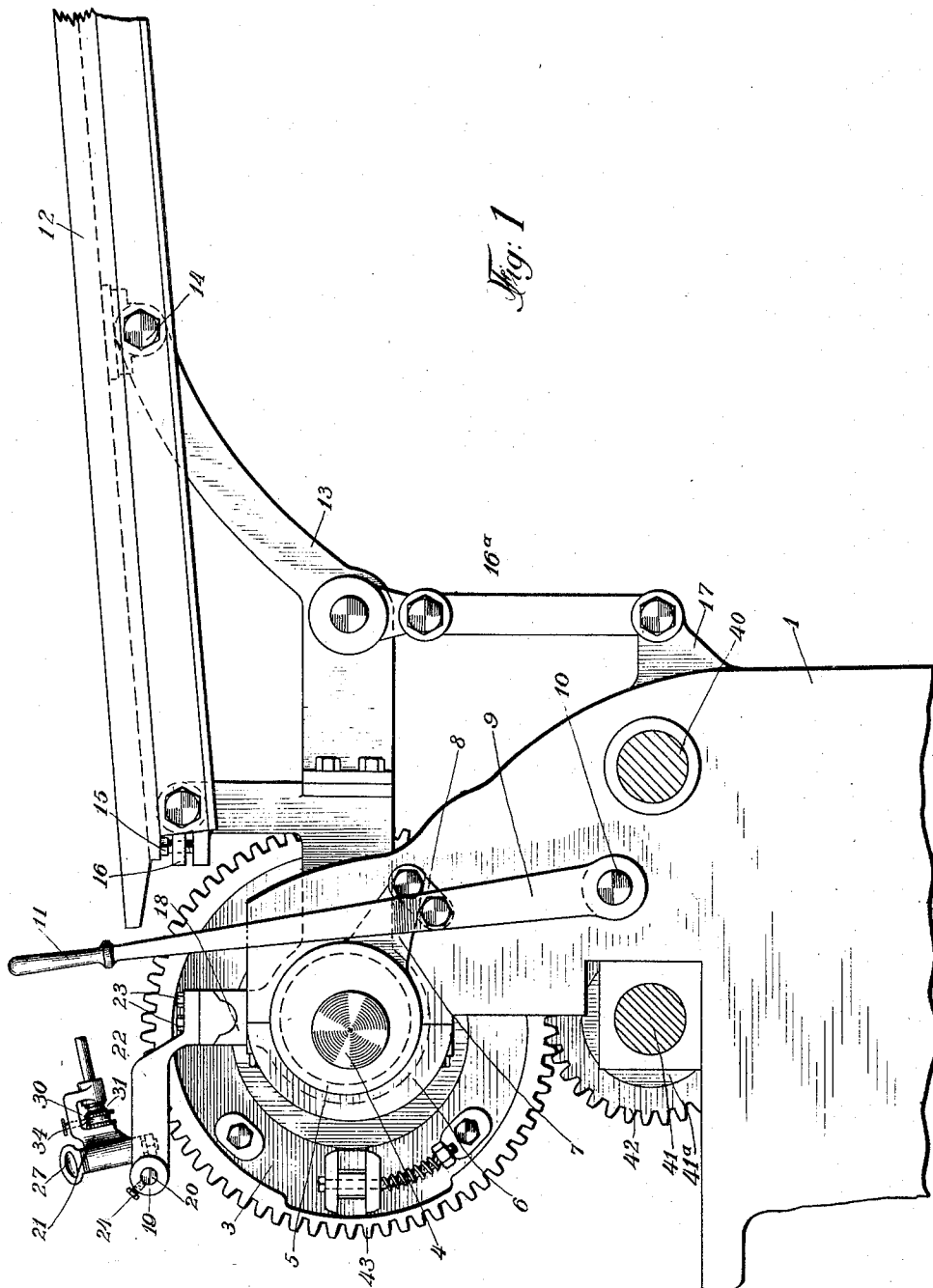


C. VAN MIDDLESWORTH.
GRIPPER MECHANISM.
APPLICATION FILED OCT. 15, 1909.

965,128.

Patented July 19, 1910.

7 SHEETS—SHEET 1.



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7 SHEETS—SHEET 2.

965,128.

Fig. 2

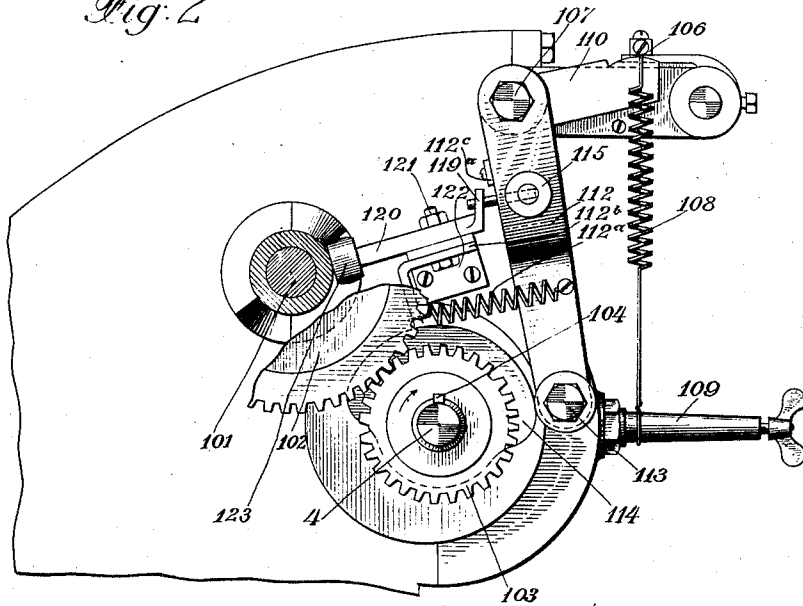


Fig. 3

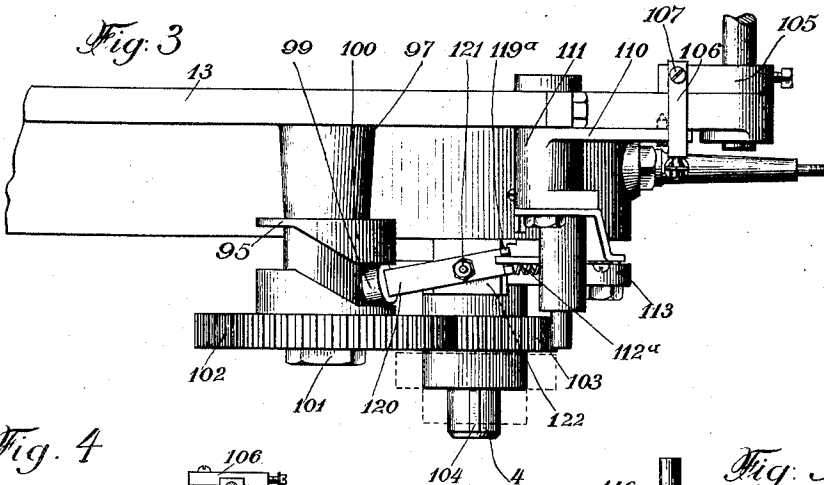


Fig. 4

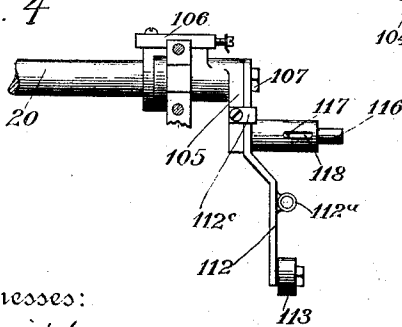
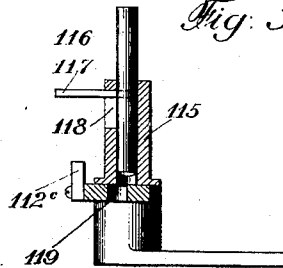


Fig. 5



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7 SHEETS—SHEET 3.

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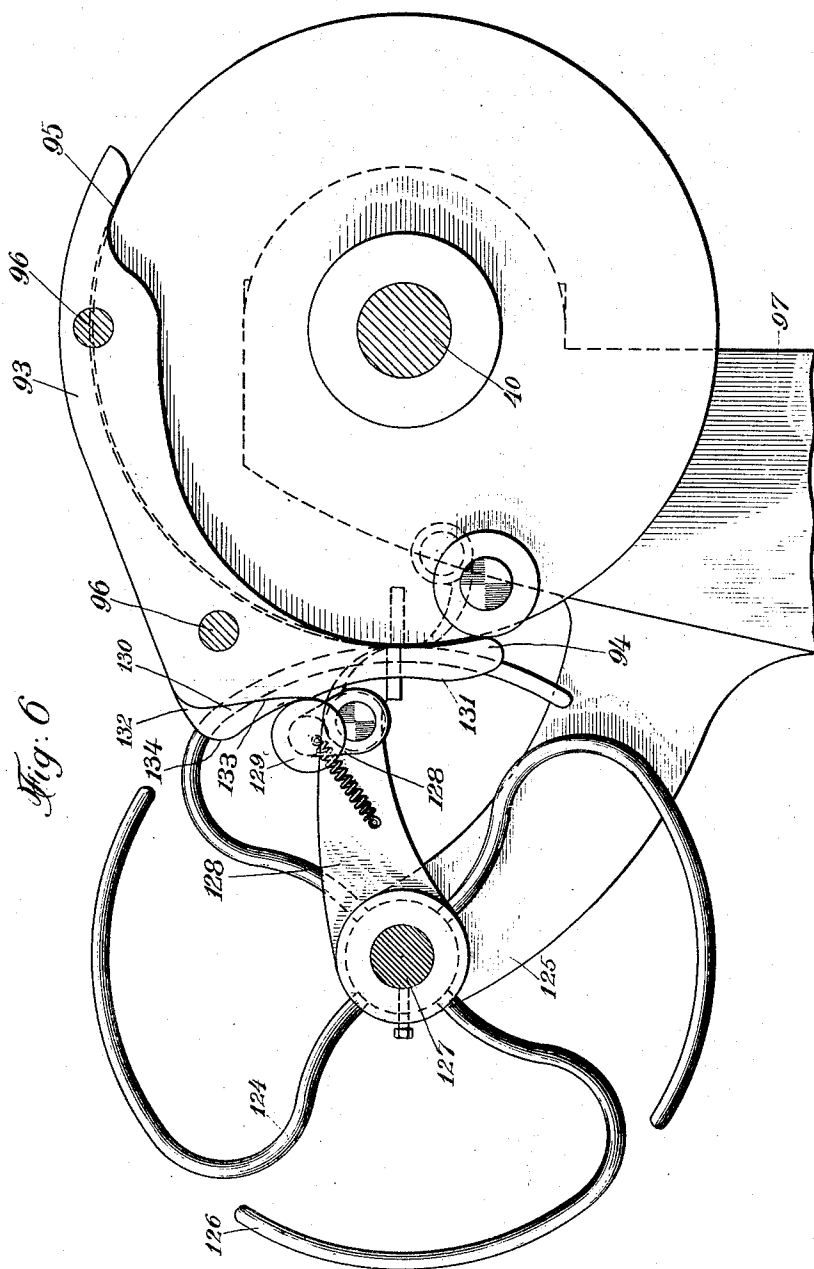


Fig. 6

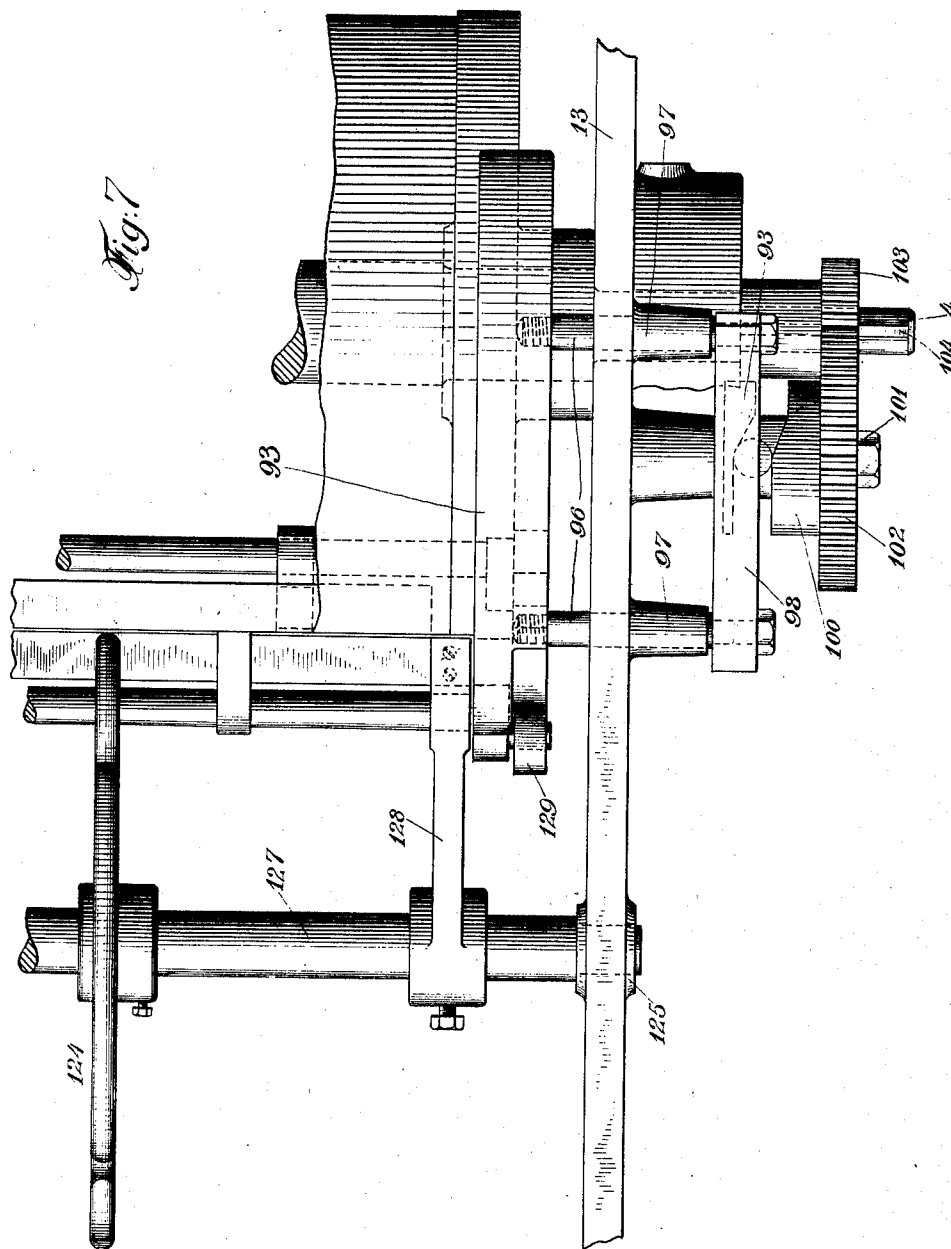
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7 SHEETS—SHEET 4.



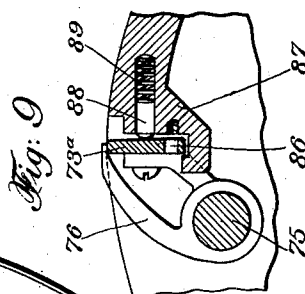
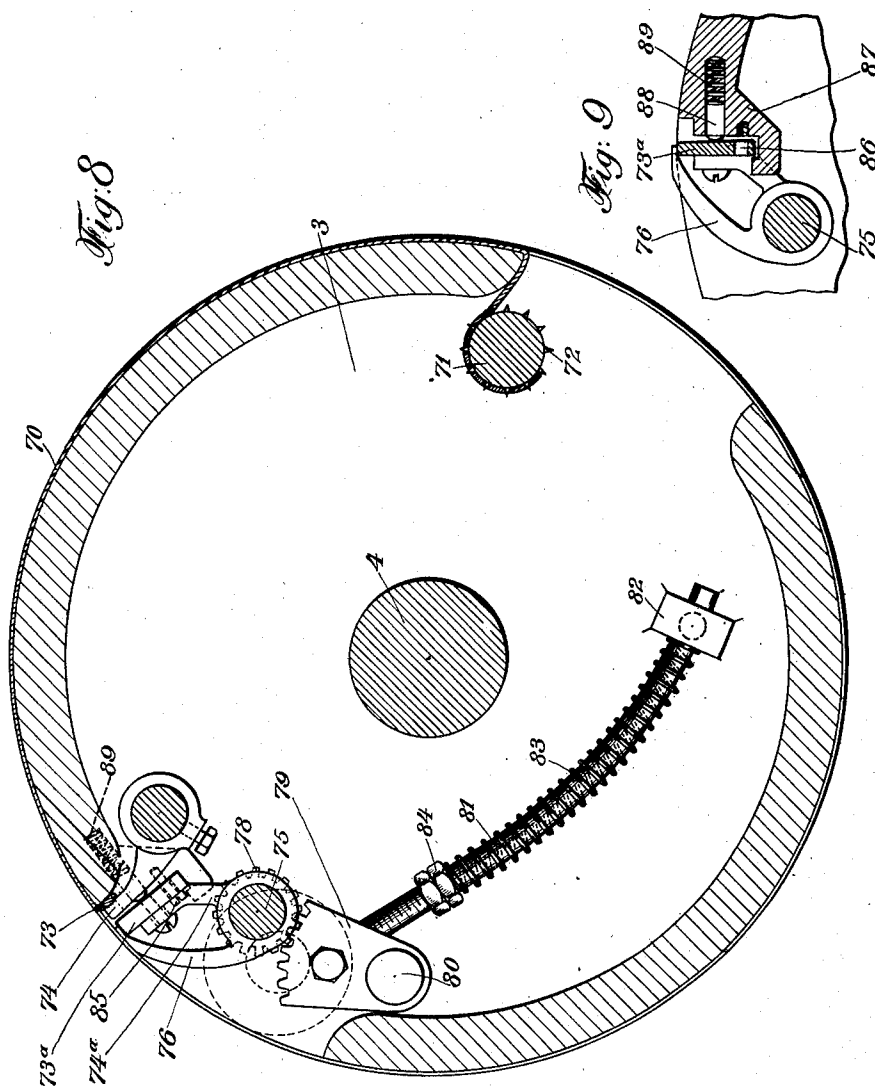
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7 SHEETS—SHEET 5.



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7 SHEETS—SHEET 6.

965,128.

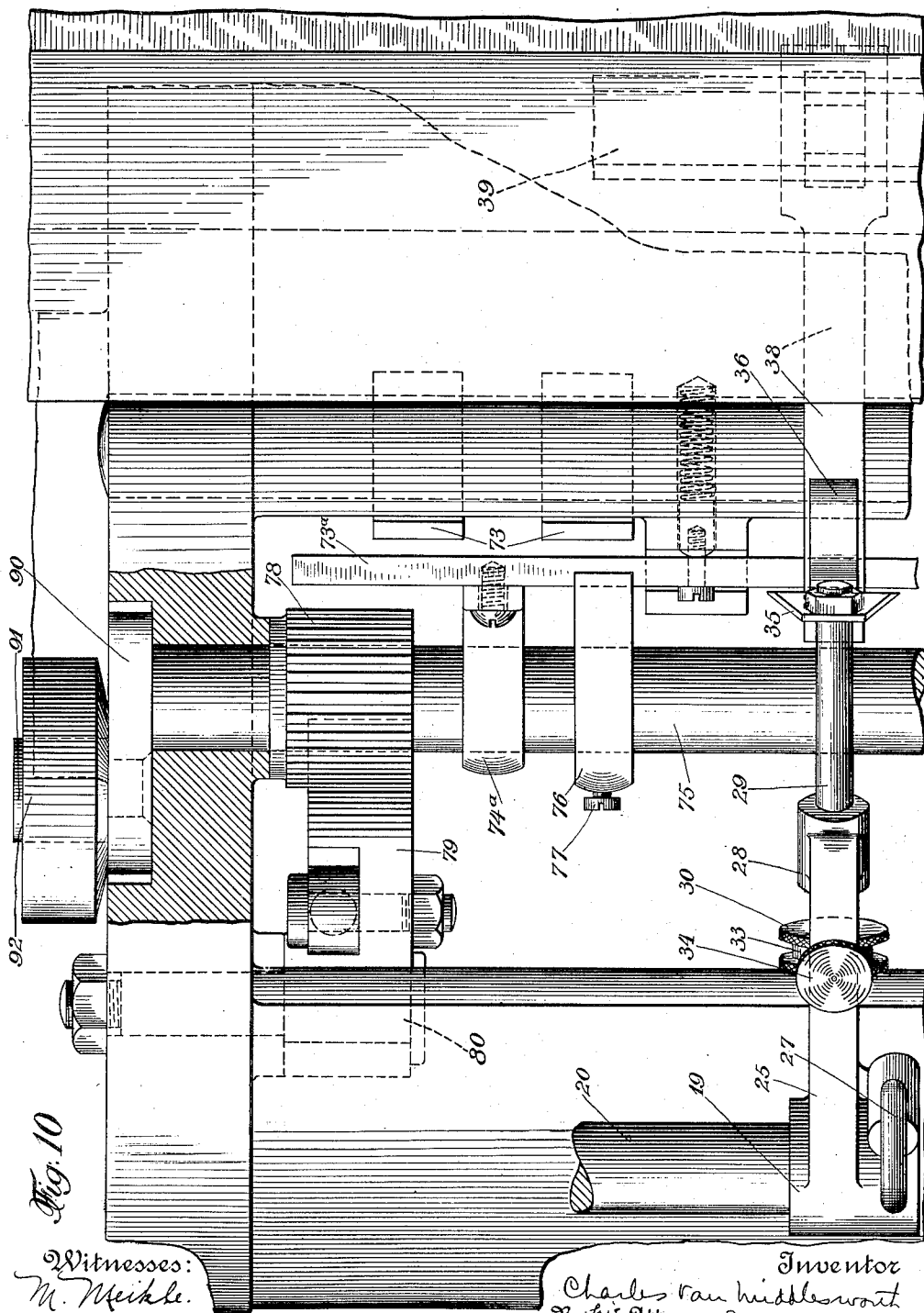


Fig. 10

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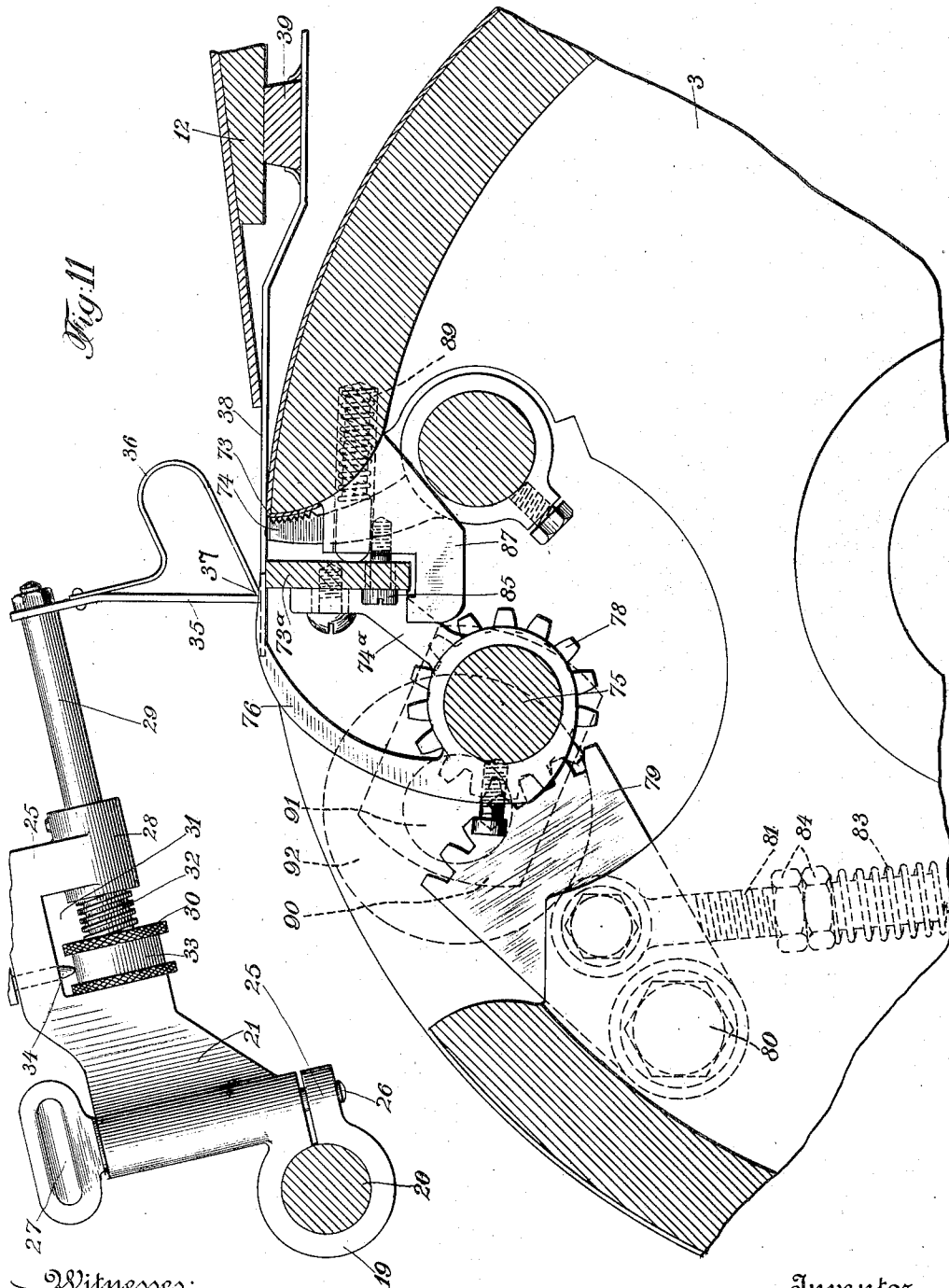
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APPLICATION FILED OCT. 15, 1909.

965,128.

Patented July 19, 1910.

7 SHEETS—SHEET 7.



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UNITED STATES PATENT OFFICE.

CHARLES VAN MIDDLESWORTH, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE VAN DYCK GRAVURE COMPANY, OF NEW YORK, N. Y.

GRIPPER MECHANISM.

965,128.

Specification of Letters Patent.

Patented July 19, 1910.

Original application filed November 23, 1908, Serial No. 464,096. Divided and this application filed October 15, 1909. Serial No. 522,750.

To all whom it may concern:

Be it known that I, CHARLES VAN MIDDLESWORTH, of Brooklyn, in the county of Kings and in the State of New York, have invented a certain new and useful Improvement in Gripper Mechanisms, (Case "A"), and do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to an improvement in gripper mechanisms, and especially to a gripper mechanism which is adapted to be operated at every revolution of the printing cylinder or at only every alternate revolution thereof, and which is adapted to be moved beneath the level of the printing cylinder when gripping a sheet of paper.

This is a divisional application of my application for printing machines, Serial No. 464,096, filed November 23rd, 1908.

I have shown one embodiment of my invention in the accompanying drawings, in which—

Figure 1 is a side view of a printing press equipped with my invention; Fig. 2 is a side view of the operating mechanism for the grippers; Fig. 3 is a plan view of the parts shown in Fig. 2; Figs. 4 and 5 are enlarged views of details of the operating mechanism; Fig. 6 is a side view of the rear portion of the printing press equipped with my invention; Fig. 7 is a plan view of the same; Fig. 8 is a vertical cross-section of the impression cylinder; Fig. 9 is an enlarged detail of one of the grippers carried by the same; Fig. 10 is a plan view of a portion of the printing press; and Fig. 11 is an enlarged cross-sectional view of the impression cylinder and paper guides.

In the accompanying drawings, 1 represents a side standard for supporting the parts of the printing machine, only one of these standards being shown in Fig. 1, although there is a similar standard 2 on the other side of the machine. Supported in the standards 1 and 2 there is an impression cylinder 3 having its journals 4 located in an eccentric sleeve 5 supported in the journal bearings 6. The eccentric sleeve 5 has attached thereto an arm 7, to the end of which is attached a link 8 designed to connect the eccentric sleeve with a manually-operated lever 9. The lower end of the lever 9 is pivoted at 10 to the side standard 1, while the other end of the lever is pro-

vided with a handle 11, so that the same may be conveniently moved to raise and lower the impression cylinder.

A feeding table 12 is adapted to be supported at its outer end from the standards 1 and 2, and at its inner end from the journals 5. This is accomplished in the following manner:—The table has attached thereto on its under face a supporting bracket 13, the table being pivoted to the same at 14 near the outer end of the table, while the inner end of the table is supported by means of an adjustable screw 15, screw-threaded in an upright 16 of the bracket 13, and having its head located in contact with the under face of the table. The outer end of the bracket 13 is supported from the standards 1 and 2 through the agency of links 16^a, one of which is situated on either side of the printing machine. The links 16^a are connected at their lower ends to the standards 1 and 2 by means of an integral bracket 17 projecting from each of the side standards. The inner end of the supporting bracket 13 is supported directly upon the eccentric sleeve 5 at each end of the impression cylinder, as shown in Fig. 6, the bracket for this purpose being provided with a circular housing 18 surrounding the eccentric sleeve 5. It will thus be seen that by the parts above described, a movement of the handle 11 effects a movement simultaneously either up or down of the impression cylinder 3 and the feeding table 12. The supporting bracket 13 also supports journal bearings 19, located on either side of the impression cylinder, for a shaft 20, which carries a series of drop guides 21. The bearings 19 are situated in detachable arms 22, which are bolted to the upper face of the circular housing 18 by means of the bolts 23. I prevent the shaft 20 from becoming displaced out of its proper position in a lateral direction, by inserting screws 24 in the journal bearings 19 so as to register with depressions or grooves located at these points in the shaft 20. Each of the drop guides 21 comprises a bracket 25 having a split sleeve adapted to surround the shaft 20 and be tightened upon the same by means of a screw 26 having a thumb-piece 27. In the end of the bracket 25 I support, by means of a journal bearing 28, a rod 29, the inner end of which is screw-threaded so as to

carry a milled nut 30, which nut 30 is situated in an opening 31 on the end of the bracket 25. A spring 32 is provided around the rod 29, between the journal bearing 28 and the milled nut 30, so as to press the milled nut 30 continually in a rearward direction against the bracket 25. The nut 30 is furthermore provided with an annular recess 33 in which a screw-threaded pin 34 is adapted to be projected and tightened so as to maintain the milled nut in its adjusted position. The end of the rod 29 carries a depending arm 35, which is located in a vertical position. To this arm 35 is riveted a curved guide 36, the end 37 of which is directed toward the arm 35 in an angular direction. The end 37 of the curved guide 36 is, however, directed to a point on the arm 35 slightly above the end of the latter. In the downward position of the drop guide, the arm 35 is designed to rest against a tongue 38 which extends from beneath the table 12, from which it is supported by means of a transverse strip 39, as shown in Fig. 11. The shaft 20 carries a series of drop guides of the character described and the table 12 carries a series of tongues 38 cooperating with said drop guides. It will now be observed that a movement of the handle 11 so as to raise or lower the impression cylinder 3, results simultaneously in a corresponding movement of the drop guides 21 and the table 12 with its attached tongues 38.

Power is conveyed to the machine from a shaft 40 supported in the side standards 1 and 2. This shaft 40 is connected by suitable gears with a shaft 41 also situated in the side standards 1 and 2. As these gears constitute no portion of my invention, and as the understanding of the machine would be facilitated by their omission, I have left them out of the description of the machine. The shaft 41 carries the printing cylinder 41^a. The printing cylinder may be of any desired character. It may be a cylinder provided with a planographic printing surface, or it may be provided with an intaglio or relief printing surface, but in the particular printing process which I make use of in connection with this machine, I use a photogravure etching as the printing surface.

Power is conveyed from the printing cylinder by means of a gear 42 situated upon the same, to the impression cylinder 3, which latter carries at either end thereof a spring-gear 43. There are, of course, two of the gears 42 to mesh with the two gears 43.

The gripping mechanism which I provide on the impression cylinder 3 is as follows:—A tympan or bed 70 is provided on the surface of the impression cylinder 3 in the usual manner, this being attached by one end to the cylinder by being passed over a rod 71 having a series of spines 72 on its periphery,

around which the bed is wound, as shown in Fig. 8, and the other end is gripped upon a beveled edge 73 on the diametrically opposite side of the cylinder 3 by means of jaws 74. As the above means for holding the bed 70 in place is of the usual type, I shall not describe it further. The cylinder is furthermore provided with gripping jaws for the sheet of paper to be printed upon. The lower jaw, as shown in Figs. 10 and 11, comprises a bar 73^a extending entirely across the cylinder 3, and supported upon arms or brackets 74^a situated upon a shaft 75 journaled in the two ends of the cylinder 3. The arms 74^a are loosely carried upon the shaft 75. Upper jaws 76 are also situated upon the same shaft 75, there being a plurality of these jaws 76 situated along said shaft and bearing upon the lower jaw 73^a. Each jaw 76 carries a screw 77, the purpose of which is to tighten the jaw 76 upon the shaft 75 when once a proper adjustment of the same has been effected, and also to cause said jaw to move in unison with the shaft 75. At either end of the shaft 75 and upon the interior of the cylinder 3, I locate a gear 78, with which a segmental gear 79, also located at either end of the cylinder on the interior thereof, is adapted to mesh. The segmental gears 79 are pivoted at one end 80 to the ends of the cylinder. The center of each segmental gear 79 has attached thereto a rod 81, the other end of which is passed loosely through an apertured lug 82, situated at either end of the cylinder 3. A spring 83 is designed to rest at one end against the lug 82, and at the other end against a pair of nuts 84, screw-threaded upon the rod 81. The effect of this construction is to normally push the segmental gears 79 upwardly and thus, through the agency of the gears 78, to cause the jaws 76 to close upon the jaw 73^a. The jaw 73^a is movable, but its movement is restricted by a series of pins 85 which extend through slots 86 therein and are screw-threaded in brackets 87 projecting from the interior of the cylinder 3. When the arms 76 are in their raised position, the means for effecting which will be hereinafter described, the jaw 73^a is automatically pressed upwardly or outwardly because of the presence of a plurality of spring-pressed heads 88 located in the faces of the brackets 87 and extending into the body of the shell of the cylinder 3, as shown in Figs. 10 and 11. The heads 88 are normally pressed outwardly against the face of the jaw 73^a by the encircling springs 89. Although, as described, the jaws 76, when raised, permit the jaw 73^a to rise to a certain extent also, the depression of the jaws 76 through the agency of the springs 83, causes the jaw 73^a also to be depressed against the force of the springs 89, as the force of the springs 83 is greater than the

force of the springs 89. This arrangement permits a sheet of paper to be gripped at the outer periphery of the cylinder 3, but at the same time causes the grippers 73^a and 76 to be retracted beneath the periphery of the cylinder 3 when the grippers reach the printing cylinder. The position in which the grippers are retracted beneath the surface of the impression cylinder is shown in Fig. 8.

In order to effect the raising of the jaws 76, the shaft 75 is provided at one end with a short lever arm 90, having at the outer end thereof a journal 91 for a roller 92. The roller 92 is designed to run upon the inner surface of a cam 93.

In the operation of the machine, the roller 92 first strikes the cam 93 at its lower end, indicated at 94, at which point the jaws 76 are raised so as to release the sheet of paper and permit it to be removed from the machine by mechanical devices to be hereinafter referred to. As the roller passes upwardly along the cam 93, the gripper jaws 76 are retained in their open position. The cam 93 near its upper end is given a deeper curve or cut 95. The machine is so constructed that when the roller 92 reaches the deeper curve 95, the jaw 73^a will have reached the edge of the sheet of paper to be fed into the machine, and the jaws 76 will have been lowered so as to grasp the sheet of paper, the jaws 73^a and 76 being at this point maintained so that the sheet is grasped at the outer periphery of the impression cylinder 3. At this point in the operation of the machine, the jaws 73^a and 76 are maintained in the position shown in Fig. 9. As the roller 92 passes along the deeper cut 95 in the cam 93, the jaws are maintained in the position named. When, however, the roller 92 passes beyond the end of the cam 93, both of the jaws are moved to a lower position, *i. e.*, that shown in Fig. 8, in which they are beneath the outer periphery of the cylinder 3 and are thus removed from any liability to contact with and injure the printing cylinder.

As above described, the machine would operate in such a manner as to print a sheet at every revolution thereof. I have so constructed my machine, however, that it may be adjusted so as to operate at every other revolution. When so adjusted, each sheet of paper will receive two impressions instead of one, thus deepening the tone of the particular color being printed. The mechanism which I use for this purpose is constructed as follows:—The cam 93 is carried upon two slide rods 96 which are supported by and extend through an extension 97 of one of the supporting brackets 13 which support the table 12. The two rods 96 after extending through the extension 97, are connected to each other by a bar 98. The

bar 98 carries near its center a roller 99, which runs within a cam 100, carried upon a stub shaft 101 also carried in the extension 97. The said shaft 101 also carries beyond the cam 93 a gear 102 which meshes with another gear 103, situated upon an extension of the shaft 4 which carries the impression cylinder. The gear 102 is exactly twice the diameter of the gear 103, so that as a consequence, when the gears are in mesh a single rotation of the impression cylinder will produce a half revolution of the gear 102, thus requiring two revolutions of the gear 103 for each complete revolution of the gear 102. When the cam 93 has been pulled by the roller 99 running upon the cam surface 100, as far away from the impression cylinder as possible, said cam 93 is withdrawn from the path of movement of the roller 92. When the cam 93 is in this position, therefore, the roller 92 is not operated upon, and as a consequence, the grippers remain closed. The cam surface 100 is of such a shape, as will be seen by an inspection of Fig. 3, that during a half revolution of the gear 102 the cam 93 is removed from the path of the roller 92, and for the remaining half revolution of the gear 102 said cam 93 is located in the path of the roller 92.

In the operation of this device it will thus be seen that as the gear 103 revolves the gear 102 will cause the cam 93 to be moved out of the path of the roller 92 for every alternate revolution of the gear 103. The impression cylinder is therefore caused to be rotated through two complete revolutions without the disengagement of the grippers, so as to effect a double impression upon the sheet. I have, however, made the shaft 4 sufficiently long so that the gear 103, which is carried upon said shaft and secured thereto by means of a spline 104, may be moved out of mesh with the gear 102 so as to disengage the shafts 4 and 101. When so moved the gear 103 will occupy a position such as shown in dotted lines in Fig. 3. As the paper is grasped by the gripper jaws 73^a and 76, it is, of course, necessary to move the drop guides 21 upwardly out of the path of the sheet of paper, and in order to effect this, I locate upon the end of the shaft 20, as shown in Fig. 3, a lever arm 105, which has a lateral extension 106 attached thereto by means of a screw 107. The lever arm 105 is tightly secured to said shaft 20. The lateral extension 106 is adapted to be normally drawn downwardly by means of a spring 108, which is attached at its lower end to any convenient support, such as rod 109.

A bell-crank lever 110 is pivoted to the frame 97 upon a stub shaft 111. One end of this bell-crank lever 110 extends beneath the lateral projection 106, where the said

lever 110 is curved to permit the extension 106 to move over it with as little friction as possible. Upon the same stub shaft 111 there is a depending lever arm 112 loosely
 5 carried upon said shaft, the lower end of which carries a roller 113 designed to run upon a cam 114, tightly secured to the shaft 4. The lower end of the lever arm 112 is normally maintained in contact with the
 10 cam 114 by a spring 112^a, which is attached thereto at one end and at the other end to a small bracket 112^b attached to the frame 97. The lever arm 112 is furthermore maintained from passing beyond one side of the
 15 bell-crank lever 110 by a projection 112^c, situated upon the lower end of the bell-crank lever 110 and projecting beyond the lever arm 112. The lever arm 112 carries near its center a bushing 115, in the center
 20 of which is situated a longitudinally movable rod or plunger 116 having a pin 117 attached thereto and adapted to slide within a slot 118 in the side of said bushing. The lower end of the bell-crank lever 110 is provided with a hole 119 alining with the opening
 25 in the bushing 115. When the pin 117 is located at the inner end of the slot 118, as shown in Fig. 4, the plunger 116 is projected into the hole 119, situated in the end
 30 of the bell-crank lever 110. Any movement of the lever arm 112 in this position of the parts, therefore, causes a corresponding movement of the bell-crank lever 110.

The plunger 116 is moved back and forth
 35 into and out of engagement with the hole 119 by the movement of the pin 117, which engages with the bifurcated end 119^a of a lever 120, pivoted at 121 to a bracket 122 carried upon the side of the frame 97. The
 40 lever 120 has at its other end a roller 123, which runs within the cam 100, above referred to. When the plunger 116 is maintained at its innermost position, in which it engages the hole 119, the rotation of the
 45 shaft 4, and as a consequence the attached cam 114, causes the lever arm 112 to be moved in unison with the bell-crank 110. As a consequence, with each revolution of the impression cylinder the drop guides 21
 50 are raised at the moment that the grippers pass the edge or end of the feeding table 12. The parts operate in the manner described when the gear 103 has been moved into the position shown in dotted lines, and the gear
 55 102 is caused to remain stationary. When, however, the gear 103 is moved inwardly so as to mesh with the gear 102, during every other revolution of the gear 103, and as a consequence the impression cylinder 3, the
 60 roller 123 is moved by the cam 100 into such a position that the pin 117 is caused to withdraw the plunger 116 from engagement with the hole 119, thereby permitting the movement of the lever arm 112 without
 65 causing the movement of the bell-crank

lever 110. In this position of the parts, therefore, the drop guides remain stationary in their lowermost positions throughout every alternate revolution of the impression cylinder, as the raising of the drop guides
 70 is unnecessary and even disadvantageous during the times when it is not desired to feed additional sheets of paper.

I provide a circular skeleton 124 of the usual type for removing and receiving the
 75 printed sheets of paper from the impression cylinder 3. This frame or skeleton 124 is carried in journal bearings 125 situated in the frame 97. The frame or skeleton 124 carries grippers 126 in the usual manner,
 80 which grippers are designed to be opened at the time that the sheet is released by the impression cylinder.

In order to effect the opening movement of the grippers 126, a shaft 127 upon which
 85 the same are located, has fixedly attached thereto a lever arm 128 which carries in its end a roller 129, designed to run upon a cam surface 130, attached to, or situated upon the cam 93. When the rods 96 have
 90 been pushed inwardly toward the impression cylinder, the cam 130 is positioned immediately above the roller 129 so that the latter travels upon the cam surface 130 in such a manner that the roller enters upon
 95 said cam surface at its lower end 131 and passes along the same to the upper end 132 thereof, where it is received by a curved depression 133 in the face of the cam. During the time that the roller 129 is upon the
 100 lower part of the cam surface 130, the grippers 126 are maintained open so as to be in position to receive the sheet of paper to be removed from the impression cylinder 3. When, however, the roller reaches the curved
 105 depression 133, the grippers 126 are permitted to close upon the sheet of paper, which, when the grippers located in the impression cylinder have released the sheet of paper, remove the same and deposit it be-
 110 neath the circular frame or skeleton 124, whence the sheet may be removed in any desired manner, by the operator or some form of mechanism. When, on the other hand, the cam 93 has been moved outwardly
 115 as far from the impression cylinder as possible, the cam surface 130 is moved into such a position that the roller 129 while still rolling upon said cam surface, does not pass into the curved depression 133 but rolls along
 120 the upper end of the cam surface 130 upon a continuation 134 of the curve situated at the upper end of the cam surface 130. As a consequence, the grippers 126 are not permitted to close while opposite the sheet of
 125 paper being carried by the impression cylinder.

The operation of the machine in general is as follows:—In case it is desired to print
 130 each sheet with a single impression, the gear

103 is moved to the outermost end of the shaft 4 out of engagement with the gear 102. The cam 93 is then moved and retained in its innermost position, in which it is adapted to engage with the rollers 92. A sheet of paper is now fed down the table 12 until it contacts with the ends of the drop guides 21. When the grippers 73^a and 76 reach the edge of this sheet of paper, the gripper jaws 76 will descend and grasp and hold the sheet of paper tightly against the jaw 73. As the roller 92 reaches the depression 95 in the cam 93, the above mentioned gripping action will be effected, and when the roller 92 passes beyond the end of the cam 93 the gripper jaws 73^a and 76 will be permitted to pass beneath the outer periphery of the impression cylinder 3, where they are removed from any possibility of contact with the printing cylinder. The sheet of paper is then rotated until it contacts with the printing surface of the printing cylinder. Meantime, the drop guides 21 have been raised through the agency of the lever arm 112, which is actuated by the cam 114 so as to permit the edge of the paper to pass onward with the cylinder without any danger of tearing. When the sheet of paper reaches the frame or skeleton 124, the grippers 126 connected thereto are caused to engage the edge of the sheet of paper because of the roller 129 reaching the curved depression 133 in the cam 130. Simultaneously with the closing of the grippers 126, the gripper jaws 73^a and 76 are opened so as to release the sheet of paper, and the same is removed beneath the frame or skeleton, where it is removed in any desired manner. In the case where it is desired to cause the sheet to be printed with a second impression, the gear 103 is moved inwardly so as to mesh with gears 102. At every alternate revolution of the shaft 4, under these circumstances, the cam 93 is moved out of the path of the roller 92, and the cam surface 134 is moved into the path of the roller 129. When so adjusted, the gripper jaws of the impression cylinder remain closed throughout two revolutions of the same, and the frame or skeleton 124 makes two revolutions with its grippers entirely open at the point where the sheet is brought into contact with the said frame or skeleton. It is only, therefore, at the end of each second revolution that the sheet is completely printed and delivered from the impression cylinder to the skeleton or frame 124. The parts of the roller bearings may be adjusted in such a manner as to increase their diameter and, therefore, the distance between the impression cylinder and the printing cylinder. The separating distance between the two cylinders can also be varied by manipulation of the lever 9. A movement of the lever 9 further effects a

raising of the table 12 and the drop guides 21 in unison with the impression cylinder 3.

While I have described my invention above in detail, I wish it to be understood that many changes may be made therein without departing from the spirit of my invention.

I claim:—

1. In a device of the character described, the combination of a rotary bed, gripping means attached thereto for gripping a sheet of paper, and means to cause two rotations of the bed before releasing the grippers comprising a lever attached to said gripping means, a rotary cam, a pair of slide rods actuated thereby, and a cam supported by said slide rods to actuate said lever.

2. In a device of the character described, the combination of a supporting bed, gripping means attached thereto for gripping a sheet of paper and adjustable means permanently mounted in the machine and adapted by a change in position to cause the grippers to be released at each impression upon a given side of the sheet of paper or only at every other impression upon said side of the sheet of paper.

3. In a device of the character described, the combination of a rotary bed, gripping means attached thereto for gripping a sheet of paper and adjustable means permanently mounted in the machine and adapted by a change in position to cause the grippers to be released at each rotation of the bed or only at every other rotation of the bed.

4. In a device of the character described, the combination of a supporting bed, gripping means attached thereto for gripping a sheet of paper, other gripping means for removing the sheet of paper from the supporting bed, and means to cause the printing of two impressions upon each sheet of paper before releasing the grippers upon the supporting bed and before causing the engagement of the sheet of paper by the closing of said other gripping means, said means comprising a lever attached to said gripping means, a rotary cam, a pair of slide rods actuated thereby, and a cam supported by said slide rods to actuate said lever.

5. In a device of the character described, the combination of a supporting bed, gripping means for gripping the sheet of paper, other gripping means for removing the sheet of paper from the supporting bed, and adjustable means to cause the grippers on the supporting bed to be released at each impression of the sheet of paper, and said other grippers to remove the sheet of paper, or to cause the release of the grippers on the supporting bed and the removal of the sheet of paper by said other grippers only at every other impression of the sheet of paper.

6. In a device of the character described, the combination of a rotary bed, gripping

means attached thereto for gripping a sheet of paper, other gripping means for removing the sheet of paper from the supporting bed and adjustable means to cause the grippers on the rotary bed to be released and said other grippers to remove the sheet of paper at each rotation of the bed, or to cause the release of the grippers on the rotary bed and the removal of the sheet of paper by said other grippers only at every other rotation of the bed.

7. In a device of the character described, the combination of an impression cylinder, a shaft carried by the same, a lower gripper jaw upon said shaft, spring-pressed means for pressing said jaw outwardly, one or more upper gripper jaws carried by said shaft, and spring-pressed means for pressing both said upper jaw or jaws and lower jaw inwardly.

8. In a device of the character described, the combination of an impression cylinder, a shaft carried by the same, a lower gripper jaw upon said shaft, spring-pressed means for pressing said jaw outwardly, a stop for stopping the outward movement at the periphery of the impression cylinder, one or more upper gripper jaws carried by said shaft and spring-pressed means for pressing

both said upper jaw or jaws and lower jaw inwardly.

9. In a device of the character described, the combination of a cylinder, a shaft therein, a plurality of grippers pivoted on said shaft, said grippers comprising two sets of independently pivoted arms carrying jaws, the jaws of one set being opposed to those of the other, and independent means operating upon each set of jaws for moving the same outwardly.

10. In a device of the character described, the combination of a cylinder, a shaft therein, a plurality of grippers pivoted on said shaft, said grippers comprising two sets of independently pivoted arms carrying jaws, the jaws of one set being opposed to those of the other, independent means operating upon each set of jaws for moving the same outwardly, and means for permitting the grippers to be withdrawn below the surface of the cylinder.

In testimony that I claim the foregoing I have hereunto set my hand.

CHARLES VAN MIDDLESWORTH.

Witnesses:

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A. NEWCOMB.