Aug. 20, 1935. M. A. SUAREZ 2,011,736

MINERVA PRINTING PRESS

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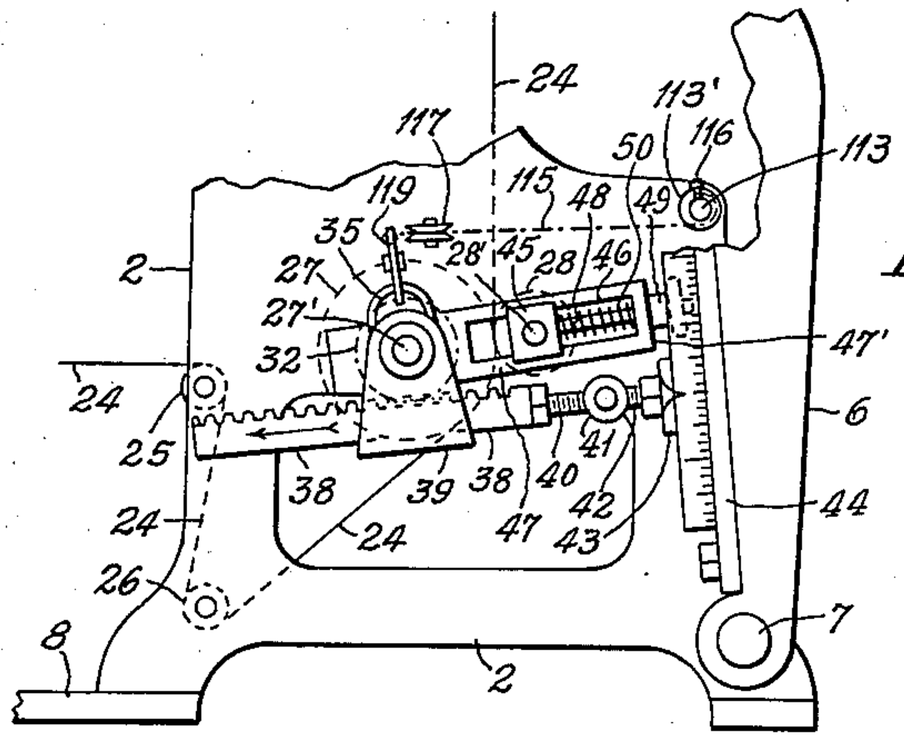

Fig. 4

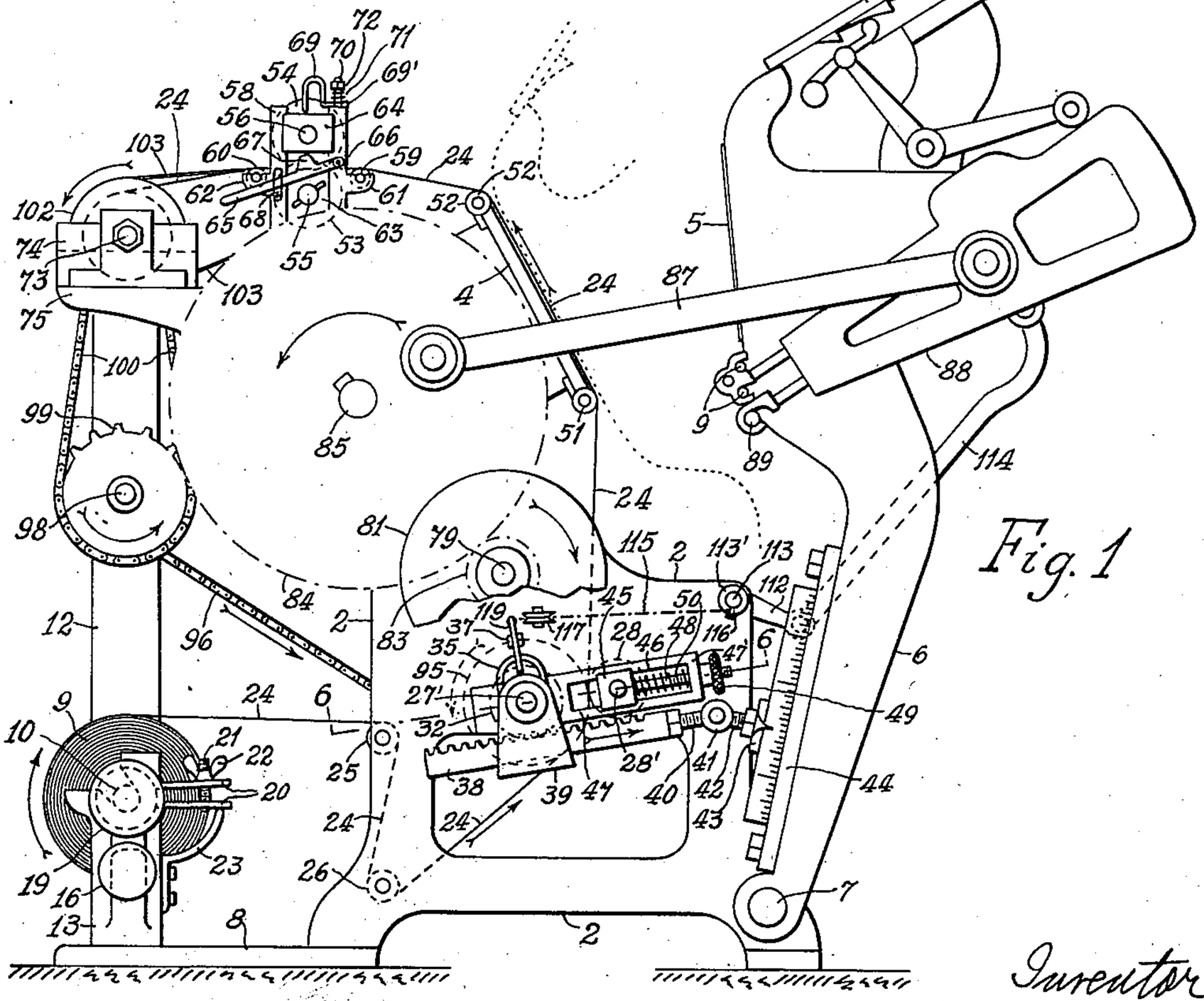

Fig. 1

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Fig. 2

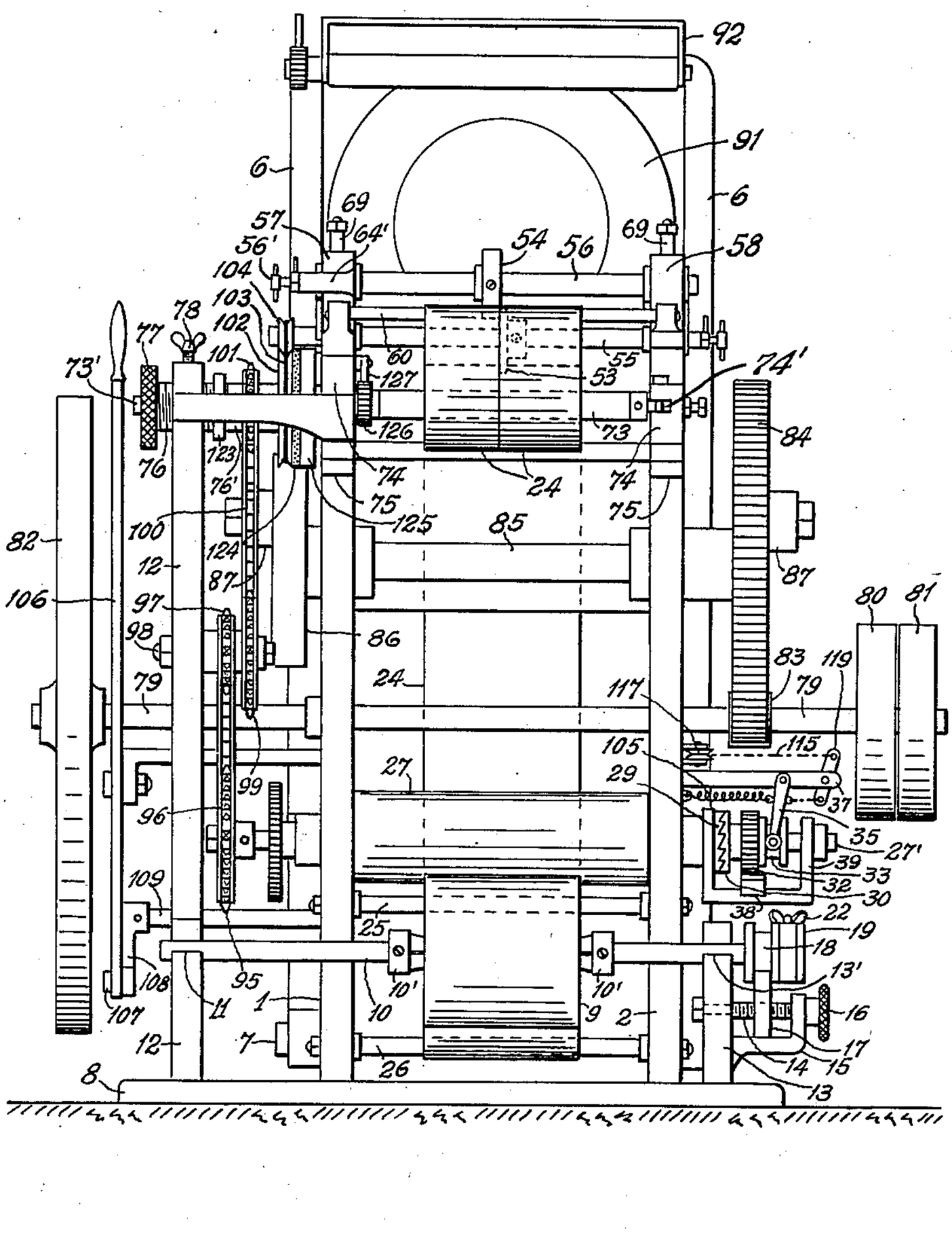

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Fig. 5

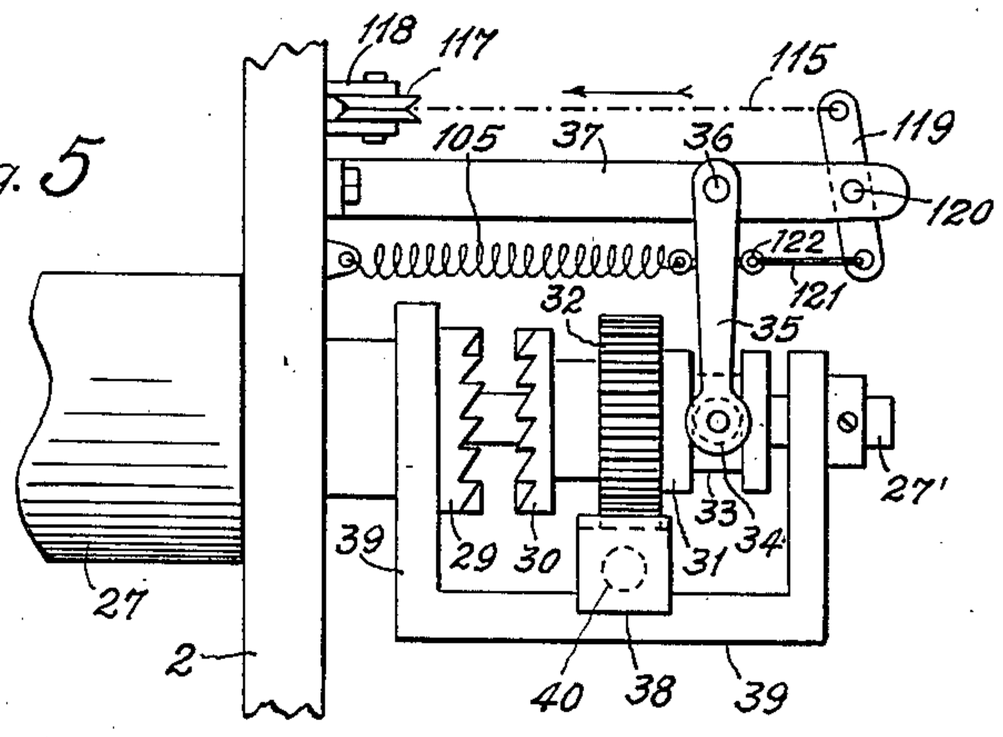
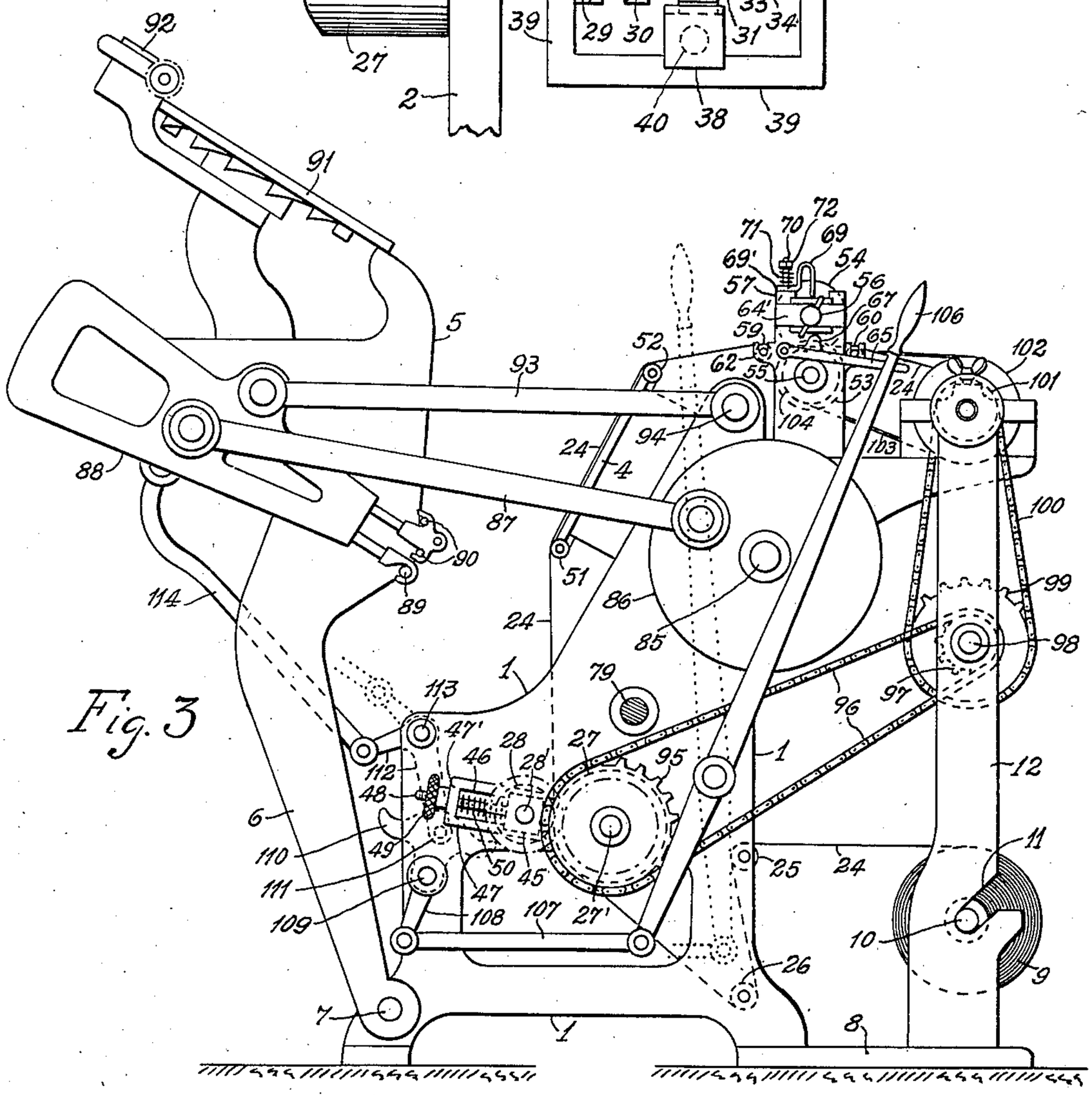


Fig. 3



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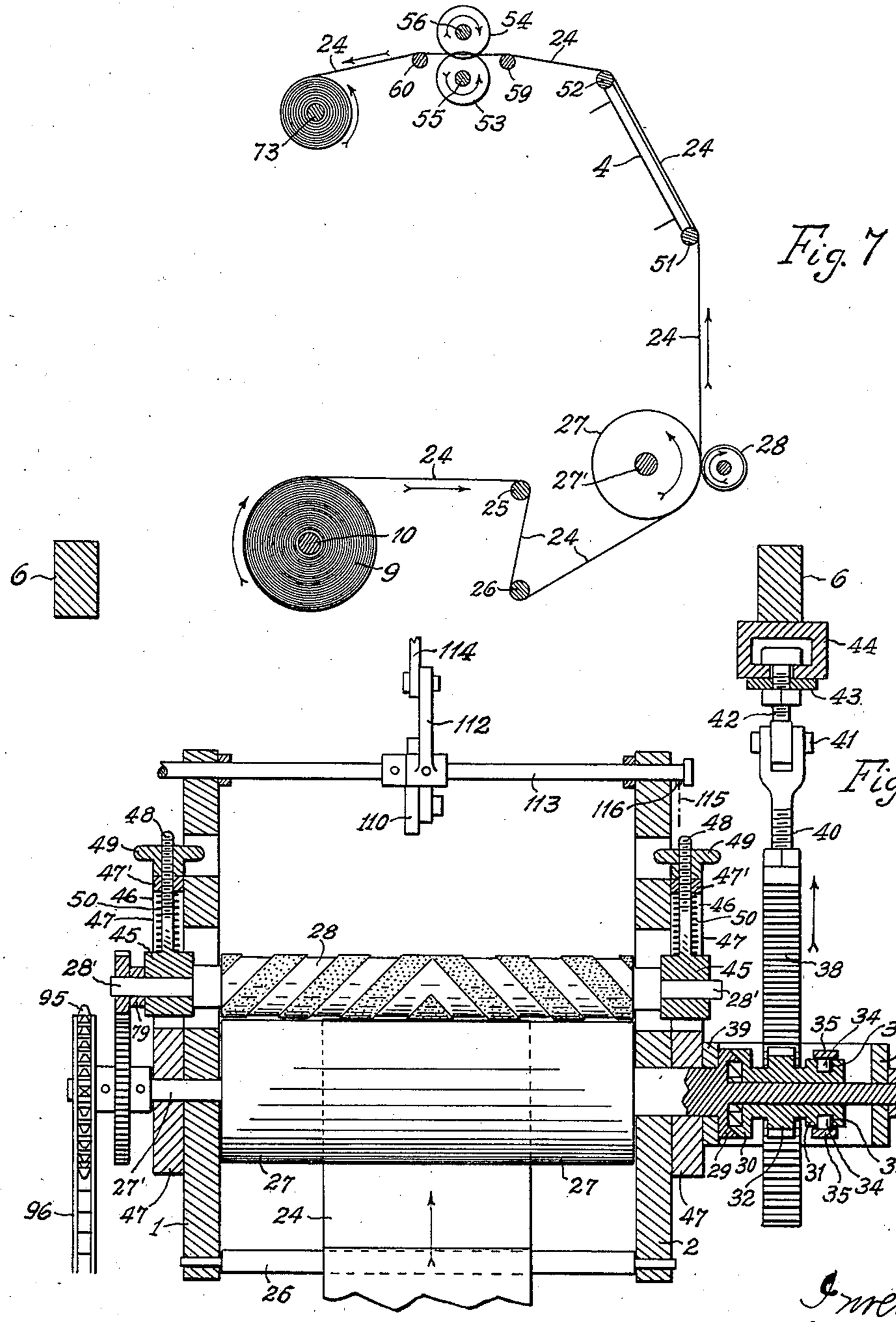

Fig. 7

Fig. 6

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UNITED STATES PATENT OFFICE

2,011,736

MINERVA PRINTING PRESS

Manuel Alonso Suarez, Habana, Cuba

Application October 10, 1933, Serial No. 693,012
In Cuba August 26, 1933

4 Claims. (Cl. 101—291)

This invention relates to Minerva presses for printing sheet paper, and it has for its object the provision of certain improvements in the construction of said presses to adapt them to work on a web which is successively unrolled from a roll, printed, longitudinally cut and rolled again. Said improvements particularly comprise a mechanism to cause the web to advance intermittently, a one-way drive clutching mechanism to engage or disengage said advancing mechanism, and means to control the length of the step by step advance of the web.

Another object of the invention is to provide a means to normally hold the clutch in its clutching position and to disengage it when the printing bed be placed in its inoperative position.

The invention is described with reference to the figures of the accompanying drawings, of which:

Fig. 1 is a side elevation of the printing press, seen from the side showing the driving mechanism.

Fig. 2 is a front elevation of the same.

Fig. 3 is a side elevation of the machine, seen from the opposite side to that seen in Fig. 1.

Fig. 4 is a fragmentary side elevation similar to that of Fig. 1, showing a modified position of the intermittent advancing mechanism for the web.

Fig. 5 is a front detail, showing the clutching mechanism to engage or disengage the intermittent advancing mechanism for the web.

Fig. 6 is an enlarged cross-section taken on line 6—6 of Fig. 1.

And Fig. 7 is a diagram showing the course of travel of the web through the printing press.

In the drawings, 1 and 2 are two side frames connected and spaced apart by cross-pieces and which support the operating mechanisms forming a Minerva press for printing sheet paper, of treadle and driving shaft, which comprises a platen 4 mounted on the side frames 1 and 2 of the press and which is designed to hold the sheets of paper to be printed, and a bed with impression screws 5 which is mounted on a frame 6 oscillatorily supported on a horizontal pivot shaft 7 mounted on a lower portion of the side frames 1 and 2, the movable frame 6 being provided with the usual inking, distributing and ink feeding devices whose detailed description is omitted here, as the same do not form a part of this invention.

This invention aims certain improvements in said Minerva printing presses, with a view to adapt them to operate on a web supplied to the machine from a roll 9 and which is successively unrolled, printed, cut and re-rolled by means of various mechanisms embodying the novelty of this invention, the same also comprising means for transmitting motion from the frame 6 to the mechanisms for propelling, cutting and rolling the web.

The roll 9 is loosely mounted on a horizontal shaft 10 provided with two cones 10′ longitudinally adjustable thereon to be adapted to different widths of the roll 9. The shaft 10 is rotatorily mounted in a slot 11 laterally formed on an upright 12 the upper portion of which is suitably connected to the upper portion of the side frame 2 in the manner which will be explained hereinafter, and in a slot 13′ laterally formed on a short upright 13, both uprights 12 and 13 being fixed on the same base 8.

Close to the shaft 10 is located a device to adjust the transversal position of the shaft, and which consists of a screw 14 rotatorily mounted in horizontal position on the upright 13 and on a bracket 15 integral with said upright 13, said screw 14 being provided with a head in the form of a grooved knob 16 for its manual operation. On said screw 14 is threadedly mounted the movable guide 17 whose edge fits in the groove of a grooved collar 18 integral with a second collar 19, both collars 18 and 19 being fixed on the end of the shaft 10 and of which the second collar 19 is also grooved and carries a brake device provided with two arms 20 adjustably connected by a screw 21 furnished with a wing nut 22 which rests on one of the arms 20, the lower arm 20 resting on a curved arm 23 secured by screws to the side of the upright 13.

The web 24, upon being unrolled from the roll 9, is passed around two guiding rollers 25 and 26 mounted at different heights on the side frames 1 and 2, which rollers guide the web first onwardly and then downwardly to go up again, in order to cause it to pass between two rubber rollers one of plain surface 27 and another of corrugated or grooved surface 28, which rollers are designed to cause the web 24 to intermittently advance through the press. The two feed rollers 27 and 28 are mounted in such a manner that their contact line shall substantially remain beneath the lower edge of the platen 4 which in the press constituting the object of the present invention is made stationary by suitable means.

The plain roller 27 is of a larger diameter than the grooved roller 28 and the former has its journals rotatorily mounted through the side frames 1 and 2 and carries at one end the non-sliding mem-

ber 29 of a one-way drive clutch whose sliding member 30 is adapted to actuate only in one direction on the non-sliding member 29 and comprises a sleeve 31 slidably mounted on the reduced extreme portion 27' of the shaft of said roller 27, the sleeve 31 having on its middle portion a gear wheel 32 and on the other extreme portion of the sleeve 31 there is formed a groove 33 designed to receive two rollers 34 carried on the ends of the two branches of the oscillatory fork arm 35 pivotally mounted in 36 on a supporting bar 37 fixed to the side frame 2 and laterally projecting therefrom. The gear wheel 32 meshes with a rack 38 which slidably rests upon the base of a yoke 39 oscillatorily mounted on the shaft 27' of the roller 27. The rack 38 is adjustable in its longitudinal position by means of a screw 40 threadedly connected to the rear end of the rack and which is connected by means of a pivotal connection 41 to another screw 42 threadedly connected to a sliding piece 43 mounted on a guide 44 secured by screws to the front of the lower portion of the movable frame 6, the object of this adjustable arrangement being to control the run of the rack 38 which in both senses will operate in opposite directions the sliding member of the clutch, while the latter will operate in only one direction the plain roller 27 through the coupling of the two clutch members 29 and 30 upon the rack 38 moving back, as shown by arrows in Fig. 1 of the drawings, thereby the web 24 being caused to advance intermittently by the pressure of the grooved roller 28 against the plain roller 27. The distance between the rolls 27 and 28 may be adjusted by mounting the shaft 28' of the roller 28 on bearings 45 which are slidable in slots formed on guiding pieces 47 oscillatorily mounted on the shaft 27' of the roller 27, projecting from the bearings 45 at one side threaded pins 48 each of which pass across an opening in the rear head 47' of each guiding piece 47 and with which is engaged on its projecting end a nut 49 resting against the head 47' and by means of which is controlled the tension of a coil spring 50 rolled on the pin 48 and which at one end rests against the side of each bearing 45 and at the other end rests against the head 47'.

The web 24 is guided as it gets in and out from the stationary platen 4 respectively by two loose guiding rollers 51 and 52 rotatorily mounted at the lower and upper edges of the platen 4. Higher above, the web 24 passes between the edges of two sets of cutting blades 53 and 54 oppositely fixed on two horizontal shafts 55 and 56 rotatorily mounted on two uprights 57 and 58 raised on the side frames 1 and 2, the web 24 being guided upon coming in and out from the cutting mechanism by two small guiding rollers 59 and 60 rotatorily mounted on lugs 61 and 62 projecting from the sides of the uprights 57 and 58 and so arranged that they will hold in a substantially horizontal position the portion of web 24 passing through the cutting mechanism.

The bearings 63 and 64 of the blade shafts are slidably mounted in the uprights 57 and 58 in such a manner that they can be removed from the top, and each of the upper bearings 64 can be pushed upwardly by means of a lever 65 pivotally mounted at 66 on one side of each upright and provided with a pushing lug 67, the lever 65 resting at its free end on a supporting clamp 68, and each bearing 64 is retained in position by means of a detent 69 of inverted U-shape which through a foot 69' with which it is provided, is rotatorily mounted on a pin 70 vertically screwed on the upper portion of each upright 57 and 58 and on which is rolled a coil spring 71 between the nut 72 and the foot 69', it being sufficient to cause the detent 69 to be rotated outwardly in order to free each upper bearing 64. The longitudinal position of the shaft 56 can be fixed by means of a set screw 56' threadedly mounted across a bridge 64' secured to the upright 57.

The web 24 is finally rolled, after cut, on a winding roller 73 whose shaft is rotatorily mounted on bearings 74 supported on brackets 75 which are integral with the side frames 1 and 2, by connecting the shaft of the roller 73, by means of a square head at the side of the press in which the upper upright 12 is located, with another shaft section 73' which passes through a threaded opening in said upright 12 by the interposition of a threaded sleeve 76 loose on said shaft and received in said threaded opening, the threaded sleeve 76 ending exteriorly in a knob 77 which is grooved on its periphery so that the position of the roller 73 can be centered by hand with respect to the web 24, and the longitudinal position of the roller 73 may be adjusted by means of a set screw 78 passing through a threaded opening formed at the upper portion of the upright 12 the lower end of which screw presses upon the threaded sleeve 76. This sleeve 76 interiorily ends in an annular disc 123 which presses against the end of a sleeve 76' loosely mounted on the shaft section 73' and which transmits the pressure by the interposition of a friction disc 124 to a metallic disc 125 secured to the shaft section 73' so that by means of the friction between the discs 124 and 125, it will serve as a brake for the roller 73 and will prevent the web from breaking. The shaft section 73' has a fixed ratchet wheel 126 engaged by a pawl 127 pivotally mounted on the bearing 74 to avoid the backward motion of the roll 73 upon winding the web 24.

The diagram of Fig. 7 clearly shows the course of travel of the web 24 from the roll 9 from which it is unrolled, then passing around the guiding rollers 25 and 26, and finally between the feed rollers, one plain 27 and another grooved 28 which give the web an intermittent drawing motion by means of the intermittent rotation of the roller 27, as above explained. The web then passes over the guiding roller 51 and is received on the stationary platen 4 arranged in a slanting position, on which it receives the impression produced on the same by the impression form mounted on the movable bed 5. As the web 24 travels out from the stationary platen 4, it is guided by the guiding roller 52 and then passes to the cutting mechanism which can have a variable number of blades 53 and 54, according to the number of strips in which the paper is sought to be cut which, as will be understood, depends on the number of impressions effected in transversal direction on the web 24, the paper being guided before and after being cut, by the guiding rollers 59 and 60 suitably disposed to maintain in a substantially horizontal position the portion of web passing across the blades 53 and 54, the web 24 being finally wound on the roller 73 which can be easily detached from the press by suitably operating the knob 77 and removing the reduced end of the roller 73 from the hole 74' of the opposite bearing 74, as shown in Fig. 2.

The motion is transmitted to the various mechanisms of the press, as follows: the motor shaft 79 rotatorily mounted on the side frames 1 and 2, has at one end a fixed pulley 80 and a loose pulley 81, and at the other end it is provided with

a fly-wheel 82. This shaft has fixed thereon a small gear wheel 83 which meshes with a larger gear wheel 84 coupled to the end of the crank-shaft 85 carrying the crank-wheel 86, there being connected to the crank-wheel 86 and to the gear wheel 84 also serving as a crank-wheel, the crank-bars 87 which are pivotally connected to the oscillatory frame 88 carrying the inking rollers 89 and 90 destined to run on the bed 5 and on the ink distributing plate 91 supplied with ink by the fountain 92 whose construction details have been omitted as the same do not form a part of this invention, and it will only be stated that for producing said motion, the oscillatory frame 88 is connected by means of a connecting bar 93 at one side of the press with a pivot pin 94 mounted on the upper portion of the side frame 1, as shown in Fig. 3 of the drawings. This gear mechanism is already known as it forms a part of the Minerva press.

For the transmission of motion to the drawings, cutting and winding rollers for the web 24, the following arrangement is made: the shaft 27' of the plain roller 27 has secured at the side of the press on which the fly-wheel 82 is placed, a sprocket wheel 95 which is connected by an endless chain 96 with another sprocket wheel 97 of a smaller diameter than the wheel 95 and fixed on a counter shaft 98 rotatorily mounted on the upright 12, and said counter shaft 98 securely carries a sprocket wheel 99 of a larger diameter than the wheel 97 and which is also connected by means of an endless chain 100 to a sprocket wheel 101 of a smaller diameter than the wheel 99 and secured to the sleeve 76'. The same sleeve 76' also has fixed a grooved pulley 102 which is rotatorily connected by an endless cord 103 with another grooved pulley 104 of a smaller diameter than the pulley 102 and secured to the lower shaft 55 of the cutting mechanism. In this manner the motion of the motor shaft 79 is transmitted by the oscillatory motion of the frame 6 to the winding roller 73 for the web 24 and from the roller 73 to the cutting mechanism whose opposite blades rotate by the friction of the blades 54 with the blades 53 at their contact edges.

The plain rubber roller 27 is normally in intermittent operative action by the coupling in a sense of the rotation of the two clutch members 29 and 30 forming respectively the nonsliding member and the sliding member of the clutch operated by the oscillatory arm 35, through the tension of a coil spring 105 connecting said arm 35 to the side frame 2. In order to disengage the clutch when it is desired that the roller 27 may not rotate and that therefore the web 24 may not advance, a mechanism is arranged to maintain the clutch disengaged, and which mechanism is connected to the operating lever 106 of the Minerva press, which serves to place the movable frame 6 in an inoperative position, and which lever 106 is connected by means of a connecting bar 107 with an arm 108 secured at the end of a counter shaft 109 rotatorily mounted on the side frames 1 and 2 of the press, a sector piece 110 being secured to the counter shaft 109, which is pivotally connected at 111 with a bell-crank lever 112 fixed on another counter shaft 113 rotatorily mounted on the side frames 1 and 2 parallelly to the shaft 109, and which bell-crank lever is pivotally connected at its other arm with a connecting bar 114 directly connected to the frame 88.

Such a mechanism to place the roller 27 in an inoperative position consists of a cord or wire 115 whose end is secured by an eye-bolt 116 to the periphery of a collar 113' fixed on the counter shaft 113 at the end of said shaft corresponding to the side of the press on which the clutch for operating the roller 27 is mounted, and said cord or wire 115 is thus in disposition to be rolled on or unrolled from the collar 113' upon the lever 106 being operated in one or another direction. Said wire or cord 115 is guided around a small grooved pulley 117 of vertical shaft rotatorily mounted on a bracket 118 fixed to the side frame 2 and it extends on a same level outwardly the side frame 2, to be fastened to the end of a lever of equal arms 119 pivotally mounted at 120 on the free end of the supporting bar 37, the opposed end of the lever 119 being connected by means of a cable 121 to an eye-bolt 122 fixed on the arm 35 at the opposite side of its point of connection with the coil spring 105. In this manner, when the lever 106 be operated by placing it in the position indicated by dotted lines in Fig. 3 of the drawings, upon the counter shaft 113 rotating to place the movable frame 6 in an inoperative position, the wire or cord 115 will be wound on the collar 113' and will draw, in the direction indicated by the arrow in Fig. 5, the arm of the lever 119 to which it is connected, which will rotate on its pivot and at the opposite arm will draw the arm 35 outwardly by means of the cable 121, causing it to rotate on its pivot point 36, whereby the clutch will be disengaged by the separation of the two clutch members 29 and 30. On the contrary, when the lever 106 be caused to take the position indicated in full lines in Fig. 3 of the drawings, the counter shaft 113 will also rotate on a contrary direction than above and the cord or wire 115 will be unwound from the collar 113' and the arm 35 will return the clutch to its connecting position, in virtue of the resiliency of the coil spring 105.

It is obvious that the construction details of the advancing mechanisms for the web, as well as the position of the same and of the cutting mechanism, can be varied without altering the essential character of the invention, which is such as claimed hereinafter.

What I claim is:

1. In a printing press of the class described, the combination with a stationary platen and an oscillating bed, controlled by an operating lever, of two feed rollers between which a web may pass in close contact before it reaches the stationary platen, means to cause the intermittent rotation of the feed rollers and including a one-way drive clutch associated with one of said feed rollers, said one way clutch being provided with a driving member slidably and rotatably mounted upon an axial extension on one of said feed rollers and adapted to engage a driven member of said clutch which is fixedly attached to said feed roller, a gear wheel carried on the slidable driving member of the one-way drive clutch, and a reciprocating rack engaging said gear wheel and pivotally connected to the oscillating bed frame and means connected to said operating lever to maintain the clutch disengaged when this lever is placed in an inoperative position.

2. In a printing press of the class described, the combination with a stationary platen and an oscillating bed controlled by an operating lever, of two feed rollers between which a web may pass in close contact before it reaches the stationary platen, means to cause an intermittent rotation of the feed rollers including a one-way drive

clutch comprising a driving member slidably and rotatably mounted upon an axial extension of one of said feed rollers and adapted to engage a driven member fixedly secured to said feed roller and a spring for moving said slidable driving member in engagement with said driven member; said slidable driving member having attached thereto a gear wheel, a pivoted lever adapted to move said driving member out of engagement with said driven member, a reciprocating rack bar meshing continuously with said gear wheel and pivotally connected to said oscillating bed, and means connected to said bed operating lever for maintaining said one-way clutch in disengaged position when the bed is in inoperative position, said means including a cable connecting said operating lever with said pivoted lever.

3. In a printing press of the class described, the combination with a stationary platen and an oscillating bed controlled by an operating lever, of two feed rollers between which a web may pass in close contact before reaching the stationary platen, means to cause one of the feed rollers to rotate intermittently including a one-way drive clutch provided with a slidable driving member rotatably secured on an axial extension of one of said feed rollers and adapted to engage a driven member fixedly secured on said feed roller, a gear wheel carried on the slidable driving member of the one-way drive clutch, a rack engaging said gear wheel, a yoke being oscillatorily mounted on the axial extension of said feed roller, a guiding piece fixed to the frame of the oscillating bed near its pivotal center, a connecting piece mounted on said guiding piece and slidably adjusted thereon, a pivotal connection whose members are respectively screwed in said rack and in said connecting piece, and means comprising a collar on a counter-shaft forming part of an operating mechanism connected to said operating lever of the press, a cable having one end connected to the periphery of said collar, the other end of said cable being connected to one end of a lever pivoted intermediate its ends, the other end of said lever being connected by a cable to a spring controlled arm provided for controlling the movement of said slidable driving member which is disengaged when the bed operating lever is placed in an inoperative position.

4. In a printing press of the class described, the combination with a stationary platen and an oscillating bed controlled by a manual operating lever, of two feed rollers between which a web may pass in close contact before reaching the stationary platen, means to cause one of the feed rollers to rotate intermittently including a one-way drive clutch on a shaft of the intermittently actuated roller, said clutch being provided with a driving member which is rotatably and slidably mounted on said shaft and a driven member fixed to said shaft, said driving member carrying a gear wheel, a rack engaging said gear wheel, a yoke supporting said rack and forming a guide for it, said yoke being oscillatorily mounted on the shaft provided with said clutch, a guiding piece fixed to the frame of the oscillating bed, near its pivotal center, a connecting piece mounted on said guiding piece and slidably adjustable thereon, a pivotal connection whose members are respectively screwed in a head on said rack and in said connecting piece, slotted supporting pieces oscillatorily mounted on the ends of the shaft of the roller provided with the clutch and on which are slidably mounted the bearings of the other feed roller, threaded pins projecting from said bearings and passing through a head of said supporting pieces, nuts screwed on the projecting ends of said screws and which rest against the head of said supporting pieces, coil springs on the pins projecting from the bearings between these bearings and the heads of the supporting pieces to control the pressure of one feed roller against the other feed roller through the web passing between them, and means comprising a collar on a counter-shaft forming part of an operating mechanism connected to said operating lever of the press, a cable having one end connected to the periphery of said collar, the other end of said cable being connected to one end of a lever pivoted intermediate its ends, the other end of said lever being connected by a cable to a spring controlled arm provided for controlling the movement of said slidable driving member which is disengaged when the bed operating lever is placed in an inoperative position.

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