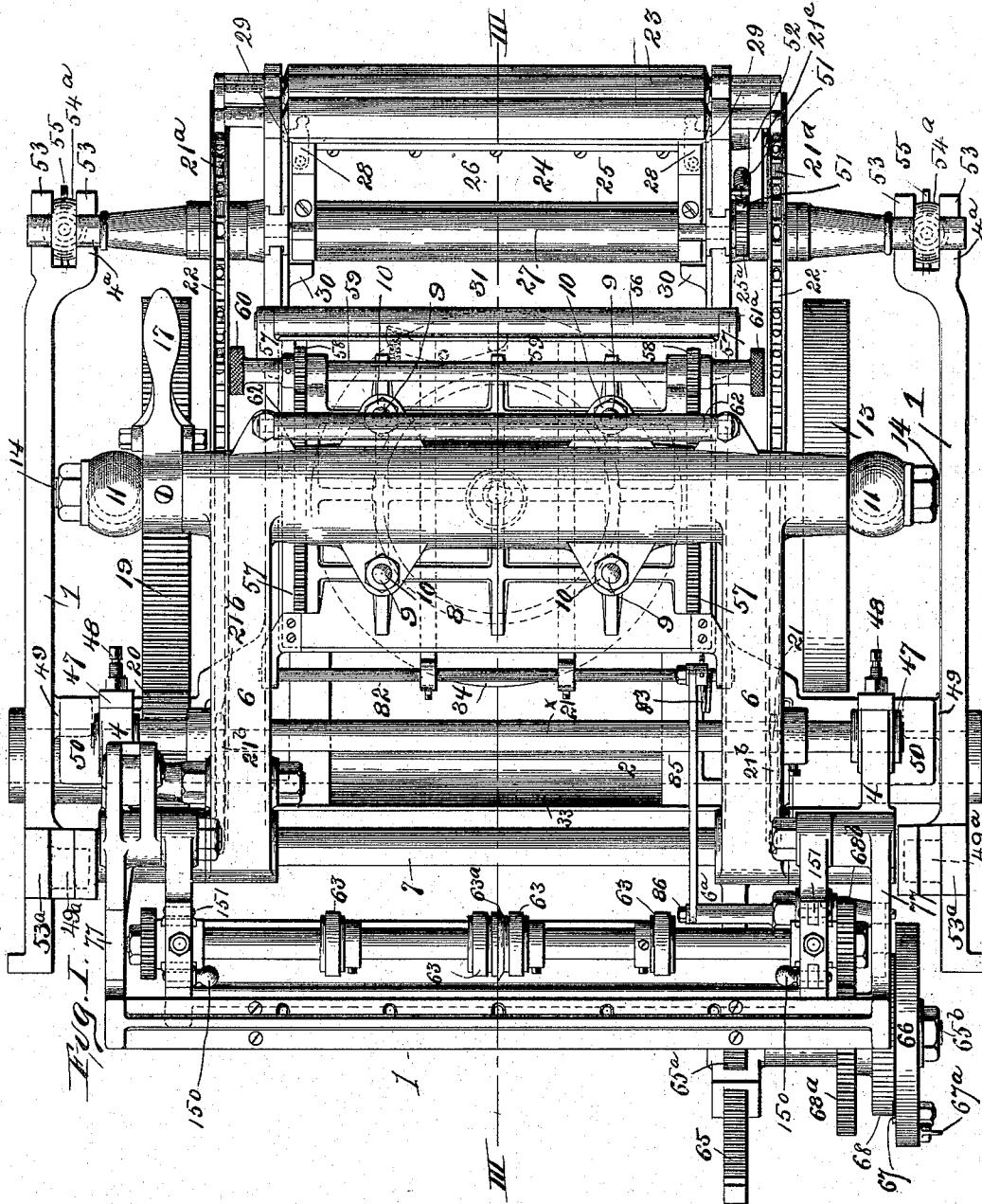


W. M. GERKEY & A. MAYERHOFF.
PRINTING PRESS.

No. 535,282.

Patented Mar. 5, 1895.



Attest:
A. W. Eberach
A. W. Eberach

Inventors:
Wm. M. Gerkey,
August Mayerhoff.
By *Knight Bros*
Attys.

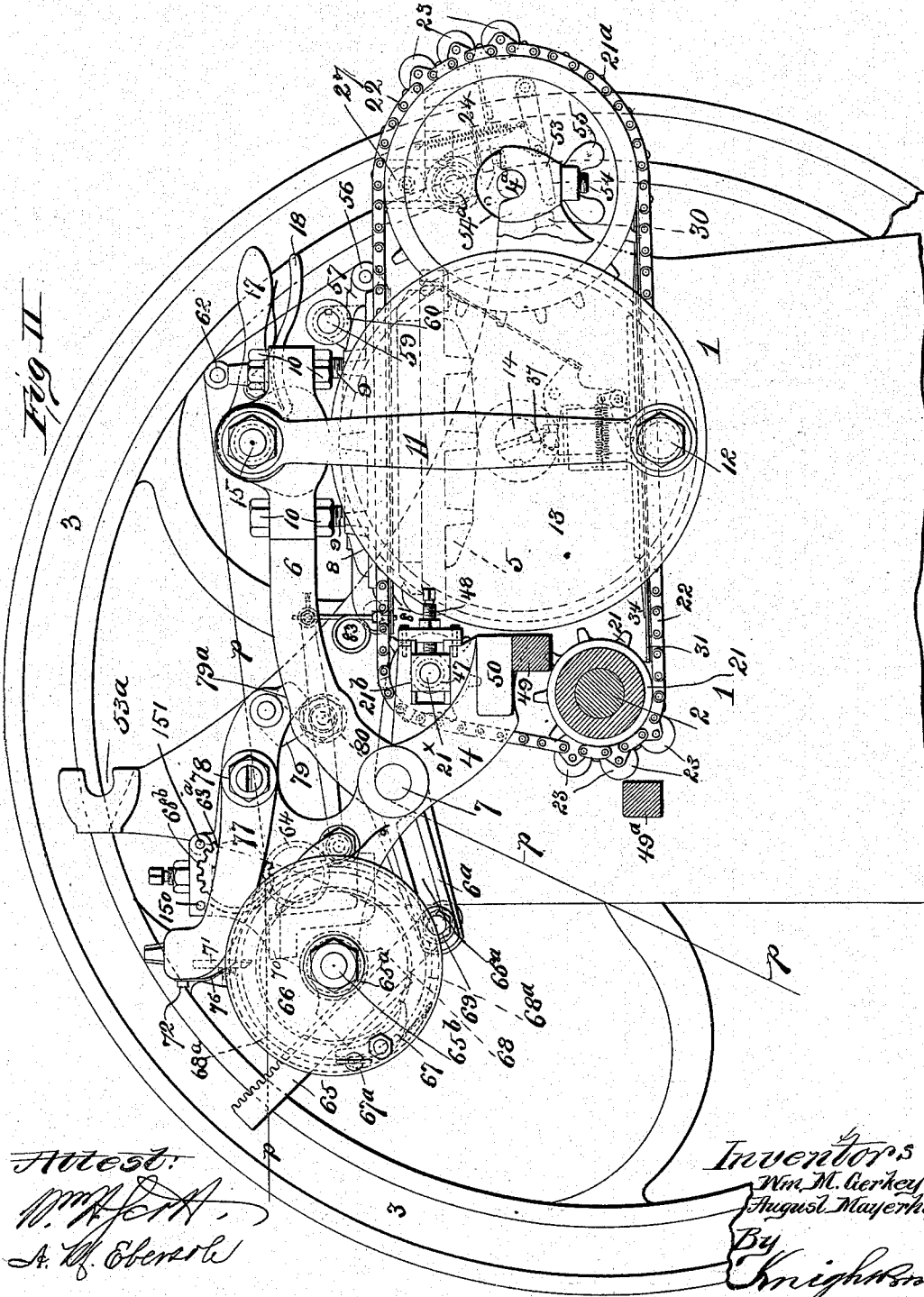
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PRINTING PRESS.

No. 535,282.

Patented Mar. 5, 1895.



Attest:

Wm. H. A.
S. M. Eberole

Inventors
Wm. M. Gierkey
August Mayerhoff.
By
Knights.

Heads

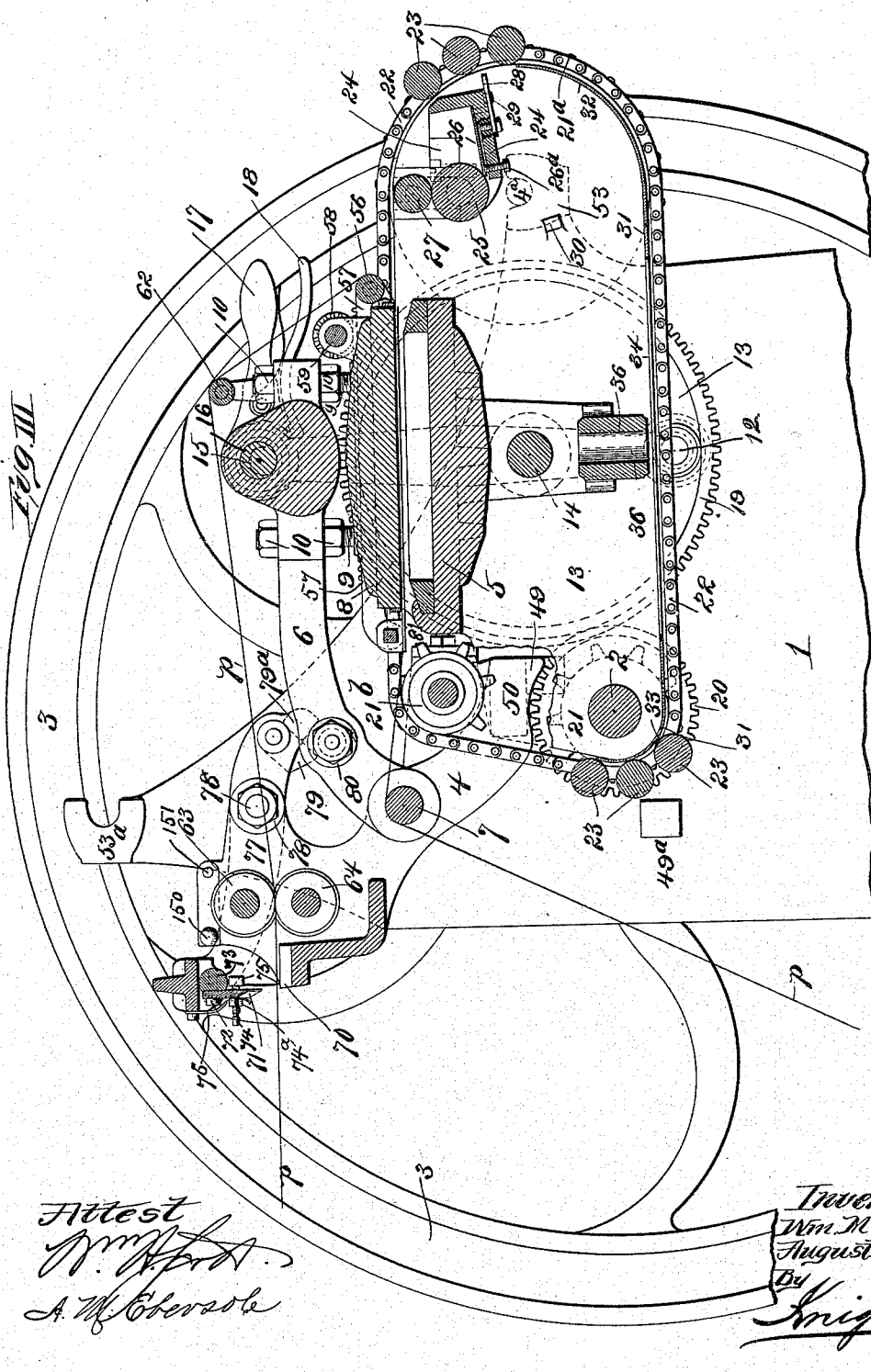
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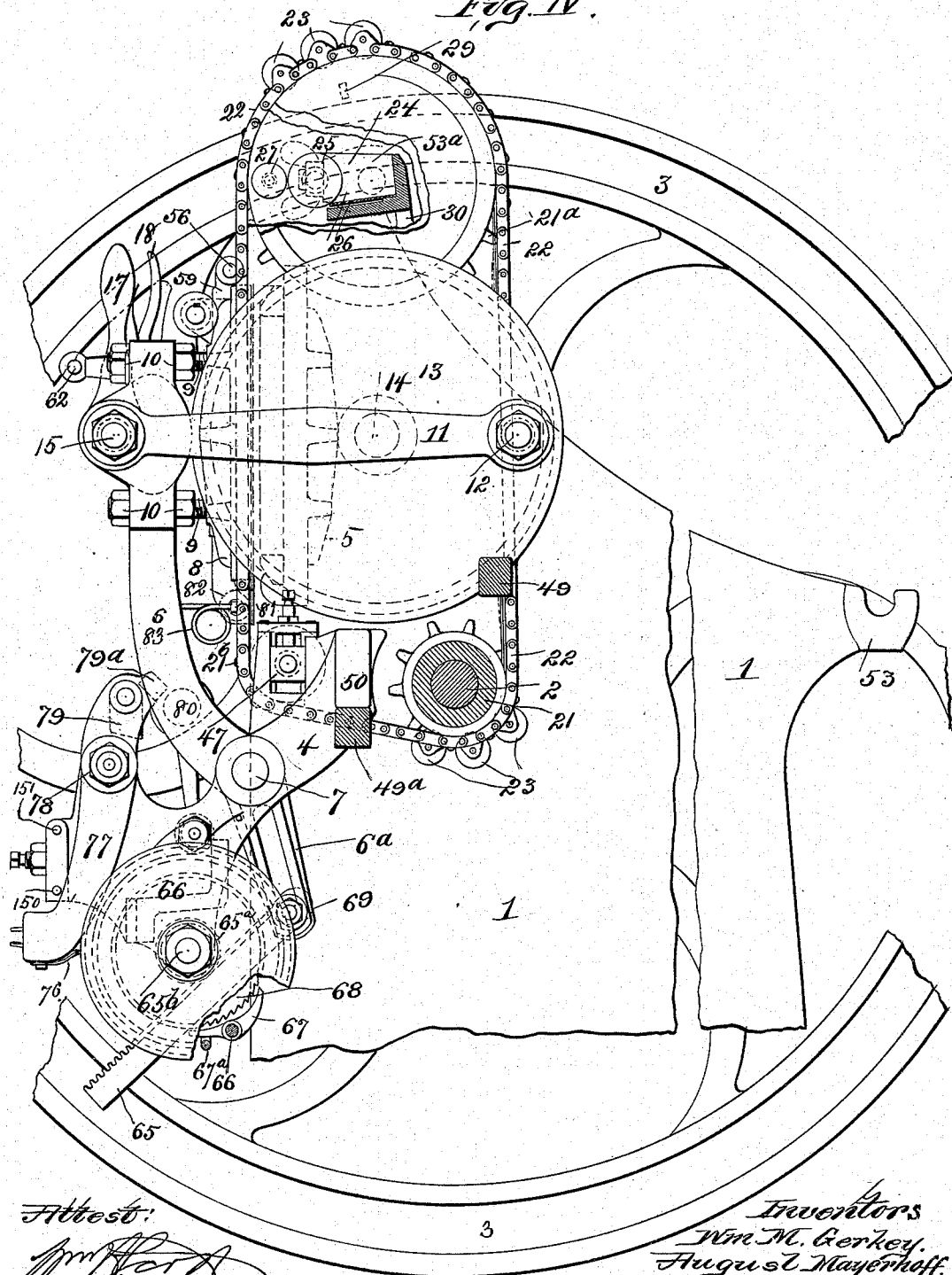
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W. M. GERKEY & A. MAYERHOFF.
PRINTING PRESS.

No. 535,282.

Patented Mar. 5, 1895.

Fig. IV.



Attest:
Wm. M. Gerkey.
A. W. Eberole

Inventors
Wm. M. Gerkey.
August Mayerhoff.
By *Knight Bros.*
Atty

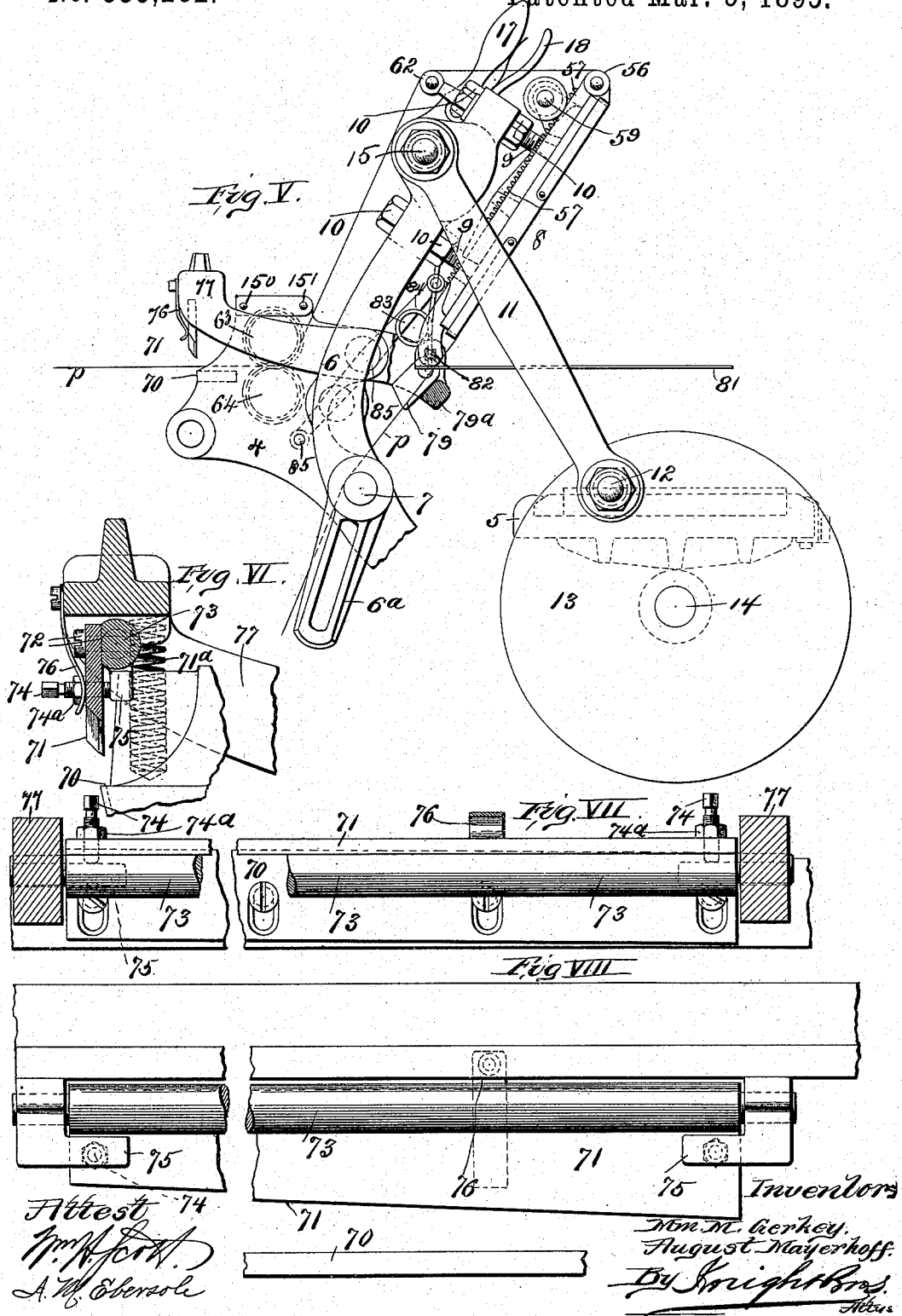
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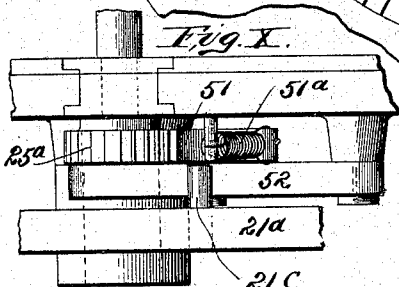
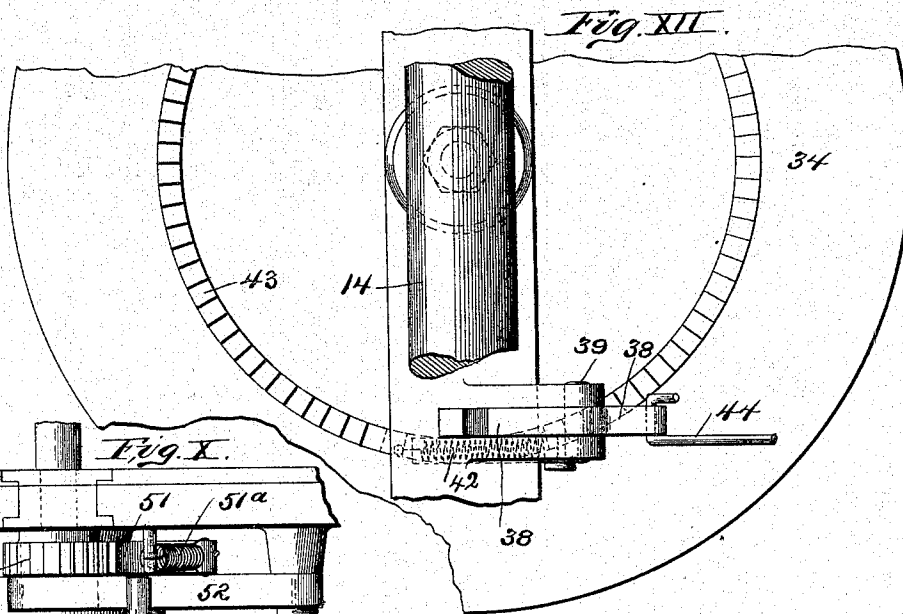
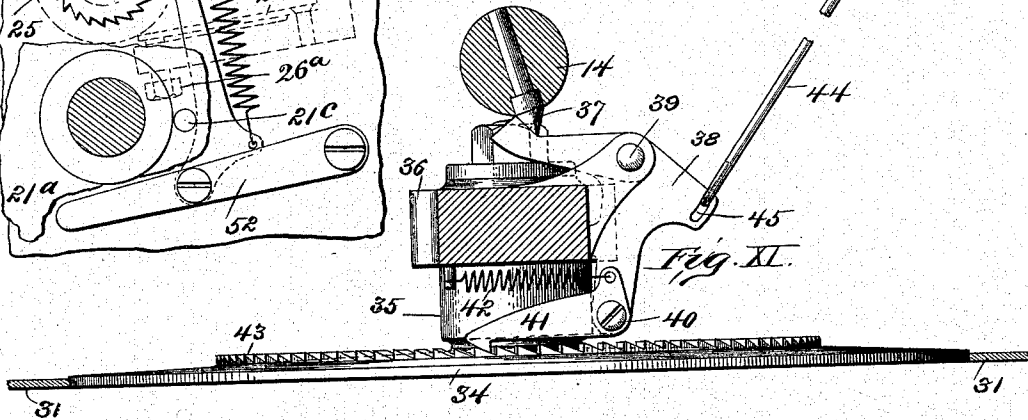
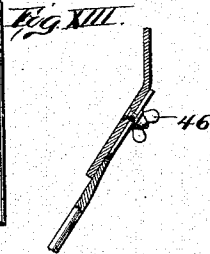
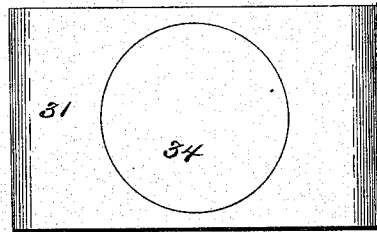
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Patented Mar. 5, 1895.



8 Sheets—Sheet 6.

No. 535,282.



Hottest
 Wm. H. J. A.
 A. M. Ebersole

Inventors
Wm. M. Gerkey
August Mayerhoff.
By Knight Bros.
Attys

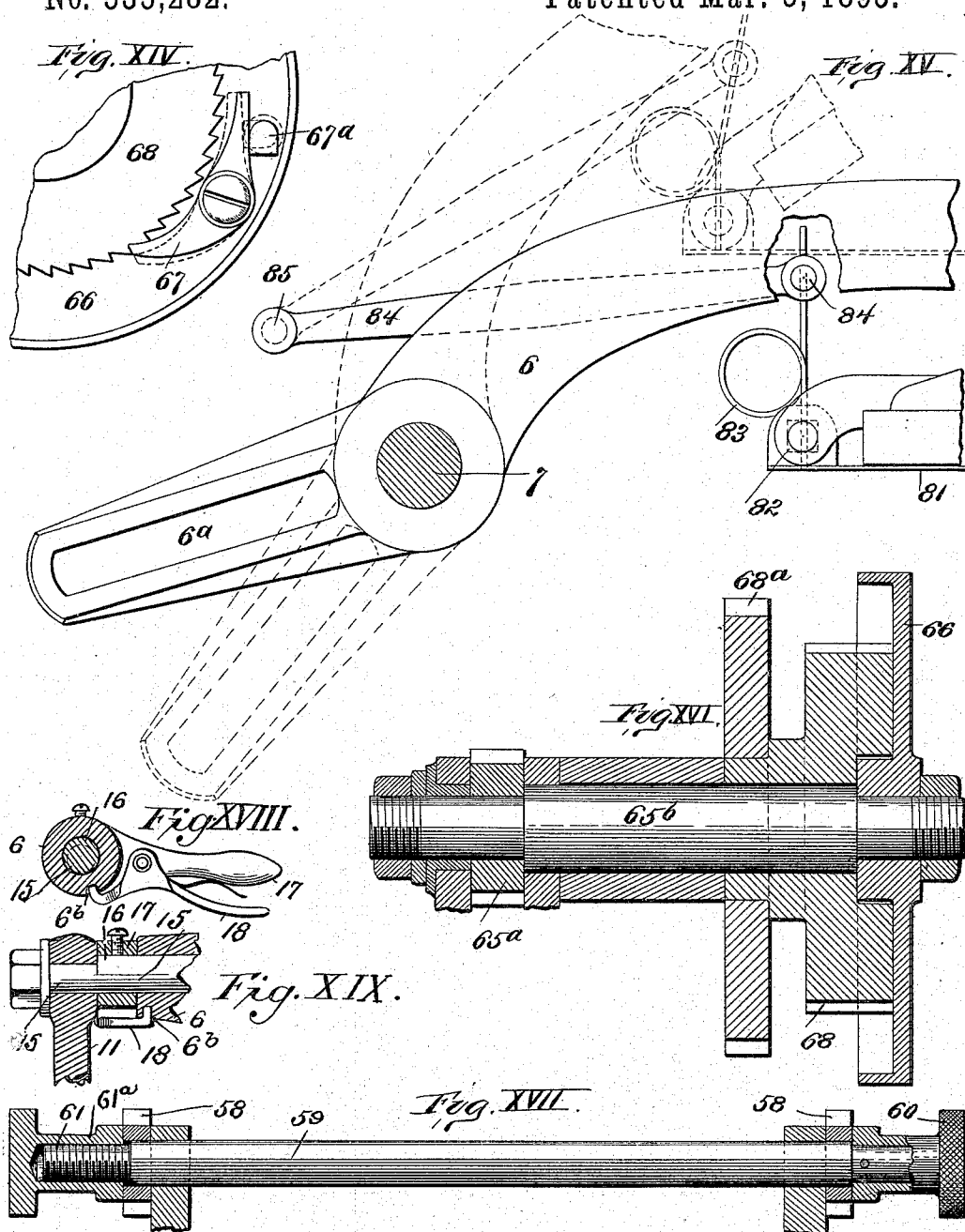
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W. M. GERKEY & A. MAYERHOFF.
PRINTING PRESS.

No. 535,282.

Patented Mar. 5, 1895.



Attest:
Wm. A. [Signature]
A. M. Oberole

Inventors
Wm. M. Gerkey
August Mayerhoff.
By *Knights Bros* Attys

W. M. GERKEY & A. MAYERHOFF.
PRINTING PRESS.

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Fig. XX.

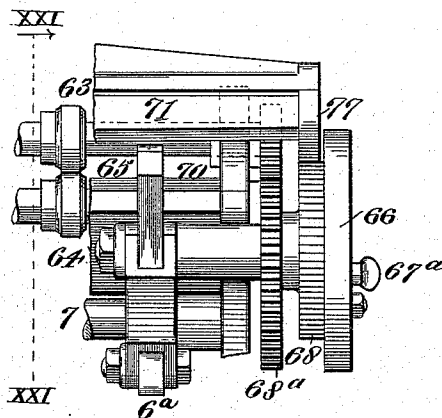
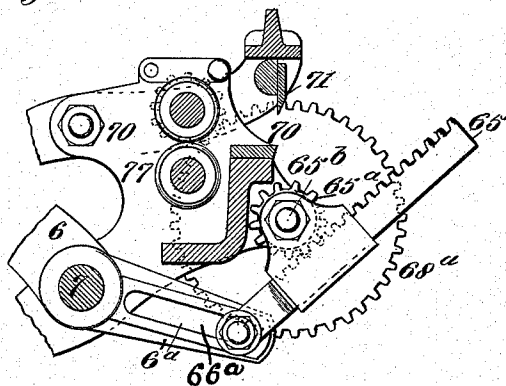


Fig. XXI.



Attest:

E. Knight
W. Finley

Inventors.

W^m M. Gerkey
August Mayerhoff
By Knight Bros
Atty's

UNITED STATES PATENT OFFICE.

WILLIAM M. GERKEY AND AUGUST MAYERHOFF, OF ST. LOUIS, MISSOURI.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 535,282, dated March 5, 1895.

Application filed July 31, 1893. Serial No. 431,950. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM M. GERKEY and AUGUST MAYERHOFF, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Printing-Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The subject of this invention is a printing machine, adapted for operation in either horizontal or vertical position, and for either endless roll, or sheet, card or other job printing.

The machine is constructed with a pivoted frame carrying the form-bed, the inking apparatus, and the platen and its accessories, mounted to turn upon the fly wheel shaft to an extent of ninety degrees from horizontal to vertical position or vice versa; supported when in operation by fixed seats and lugs upon the main frame, and locked in either horizontal or vertical position by a fastening device engaging the seat-lugs which receive the free end of the said pivoted frame.

The ink fountain, provided with customary feed and delivery rolls, is adapted to turn upon a supporting shaft in the pivoted frame, so that it may be set and locked in horizontal position in either adjustment of the pivoted frame. The ink distributing apparatus consists, in part, of a horizontal plate with up-turned or convex edges, and with a circular plate set flush in the central part of the fixed distributing plate, and having a step by step rotary motion therein, so as to constantly change the distributing surface. Inking rollers, in two or more sets, are carried by endless chains in contact with the ink supply rolls, then around the distributing plates, and thence over the form, such movement being imparted to the endless carrying chains so as to pass one set of the inking rollers over the form after each impression, whether the sets of inking rollers upon the carrying chains be two, three or more. The said carrying chains are stretched by adjustable carrying wheels to keep them taut.

The vertical position of the bed is especially adapted for sheet, card and other small or job work. For endless roll printing, the bed may be in either horizontal or vertical position, the horizontal position being preferable for

forms of large size. In either horizontal or vertical position, the roll paper is fed over carrying rolls, in the customary manner, and after passing over the form and around suitable carrying rolls, adjustable to suit the extent of feed, as hereinafter described, the paper passes between a pair of drawing feed rolls, which receive the required intermittent movement from the platen-frame after each impression, by mechanism hereinafter described. The said feed rolls are readily removable, and are made to carry perforators, cutters, slitters, or whatever device may be desired for the longitudinal severing of the sheets. The transverse cutting off is effected by a knife actuated by the platen-frame, and having an oblique edge so as to engage at one end first with the fixed cutting knife, and to act shearwise therewith from end to end.

The paper grippers consist of arms mounted on a square shaft, having a spring at one end, and actuated automatically so as to retract them from the face of the platen for the reception of a sheet, and close them against the platen when the sheet is in position. Said arms are likewise adapted to be brought up into position by hand for accurate setting with reference to the form, as hereinafter described.

To prevent an impression when a sheet or card is not in position as the platen advances, a throw off is employed, consisting of a shaft having an eccentric portion and a handle connected to the platen arm by means of a latch, so that by grasping said latch, and retracting the handle as the platen advances, the latter is drawn back relatively to its carrying arms, and thus prevented from making an impression.

The invention likewise embraces other novel features hereinafter specified.

In order that the invention may be fully understood, we will describe it in detail with reference to the accompanying drawings, in which—

Figure I is plan view of the machine without the fly-wheel. Fig. II is a side elevation thereof, with the fly-wheel, shaft, and one of the sprocket wheels, of the inking roller chains, in transverse section, and showing the platen in horizontal position. Fig. III is a section on the line III—III, Fig. I, showing the

pivoted frame and accessories in horizontal position. Fig. IV is a side view, partly in section, showing the pivoted frame and accessories in vertical position. Fig. V is a detail side elevation, showing the retracted position of the platen. Fig. VI is a transverse section of the paper cutting device. Fig. VII is a plan of the same. Fig. VIII is a front elevation thereof. Fig. IX is a detail view illustrating the operation of the ink supply rollers. Fig. X is a detail, plan view of the same. Fig. XI is an elevation, partly in section, of our improved ink distributing plate. Fig. XII is a top view of the same. Fig. XIII is a face view of the said distributing plate on a smaller scale. Fig. XIV is a detail view of the intermittent shifting mechanism of the distributing plate and means for arresting the movement thereof. Fig. XV is a detail view of the mechanism for operating the paper grippers. Figs. XVI and XVII are details hereinafter referred to. Fig. XVIII is a detail view showing the connection between the arm for turning the platen-shaft and the platen-arm through which the shaft extends. Fig. XIX is a detail sectional view showing the parts adjacent to the handle of the platen shaft. Fig. XX illustrates a front elevation of the feed roller operating mechanism. Fig. XXI is an inside view of the parts shown in Fig. XX portions being shown in section taken on the line XXI—XXI Fig. XX.

1, 1, represent different parts of the stationary frame of the machine, and 2 the main shaft carrying a fly wheel 3. On the fly wheel shaft 2 is mounted the pivoted form bed and platen frame constructed with a pair of arms 4, 4, connected by a bed plate 5, which receives the form. The platen arms 6, 6, are fulcrumed at 7 in the main arms 4, of the pivoted frame, and upon said arms 6 is mounted the platen 8, through the medium of connecting screws 9 and nuts 10, which provide, in customary manner, for the accurate adjustment of the platen in parallelism with the form bed. The platen links 11 are pivoted by the pins 12 to the crank wheel 13, mounted by a shaft 14 in the pivoted frame, the said links 11 being connected with the platen frame 6 by means of a shaft 15, having an eccentric portion 16, and provided with a hand lever 17, and a spring latch 18, by the retraction of which the shaft 15 with its eccentric portion 16 may be so turned as to lengthen the distance between the platen and form bed and thus retract the platen and prevent its producing an impression. The latch engages a notch or recess 6^b in the platen-arm for holding the platen-shaft to its adjustment until the latch is released. In other words, the platen-shaft may be considered as having journals 15 eccentric to the portion 16 which is eccentric to the journals. The crank wheels 13 are rotated in the customary manner by a cog wheel 19 gearing with a pinion 20 on the fly wheel shaft 2. Upon the said shaft 2 are also mounted a pair of sprocket wheels 21 for driving the carrying

chains 22 of the inking rollers 23. The said chains are carried, at the outer end of the pivoted frame, by large sprocket wheels 21^a, and are stretched by adjustable sprocket wheels 21^b above the wheels 21, and at such distance therefrom as to carry the two parts of the chains in parallel position. The chains 22, with the inking rollers 23, pass between the arms 4 of the pivoted frame, as shown. The inking rollers are arranged in two or more groups or sets of two, three, or more each. In the present illustration, we have shown them in two sets of three each. The mechanism is so adjusted that in operation a set of inking rollers 23 will be passed over the form after each impression, thus reducing in extent the necessary movement of the inking roller chains. The ink fountain 24 is mounted to turn on the axis of the feed roll 25, the periphery of which works against the customary cut-off plate 26, regulated by set screws 26^a, so as to control the supply of ink to the feed roll 25, from which it is conveyed to the inking rollers by a delivery roll 27, rotating in contact with the feed roll 25.

The pivoting of the ink fountain 24 is to permit the setting of it in horizontal position, in either the horizontal or vertical position of the pivoted frame. When the pivoted frame carrying the form bed and platen is set in horizontal position, as illustrated in Figs. II and III, the ink fountain 24 being lifted into horizontal position, is so retained by a pair of latches 28, shown in Figs. I and III, engaging in holes or seats 29 in the face of the pivoted frame. When the pivoted frame is set in vertical position, as shown in Fig. IV, the ink fountain 24 is turned down again to horizontal position, resting on lugs 20, prepared to receive it. The ink fountain is made removable from the frame. The automatic rotation of the ink supply roll 25 is effected by the mechanism shown in detail in Figs. IX and X. Upon the shaft of the supply roll 25, is a ratchet wheel 25^a, engaged by a pawl 51, which is carried by a pivoted arm 52, and drawn upward and into engagement with the ratchet wheel by a spring 51^a. In the rotation of the large sprocket wheel 21^a, a pin 21^c thereon comes in contact with the arm 52 so as to depress the same and impart a slight rotation to the roll 25, and as the pin passes off the arm, the spring 51^a draws the pawl up into engagement with another tooth.

The ink distribution is effected in a very thorough manner by means of a fixed plate 31, having upturned ends 32, 33, in the path of the inking rollers 23, within which plate 31 is a flush circular plate 34, having a shaft 35 by which it is pivoted in a socket 36, and receiving a step by step motion by the following means (see Figs. XI and XII):—The driving shaft 14 of the crank wheels 13 carries a tappet 37, engaging with the horizontal arm of a bell-crank-lever 38, which is fulcrumed at 39. The vertical arm of the bell crank 38 carries by a pin 40, a pawl 41, to the

heel of which is attached a spring 42, tending to draw it into engagement with a circular ratchet rack 43 on the back of the rotating, distributing plate 34. This mechanism imparts an intermittent rotary motion to the distributing plate 34 after each stroke of the platen, so as to constantly expose a new surface of the plate to the inking rollers 23. The face of the rotating plate 34 being exactly flush with that of the distributing plate 31, it will be seen that three changes in the ink distributing surfaces are presented or provided in each circuit of the inking rollers; the said inking rollers passing first over the curved end 32 of the plate, thence over the flat surface of the plate 31, thence over the surface of the rotary plate 34, and thence over the second curved end 33 of the plate, on their way to the form.

When it is desired to vary the amount of ink applied on different parts of the form, or to apply inks of different colors at different parts, the rotation of the plate 34 must of course be arrested. For this purpose we employ a rod 44 engaging with a slot 45 in the heel of the bell-crank lever 38, so as to permit the normal operation of the said lever, but adapted to draw the lever up, when required so that its horizontal arm will be depressed out of reach of the tappet 37; the rod 44 being fixed in this position by means of a clamp screw 46. The plate 34 will then remain stationary.

The shaft 21^x of the sprocket wheels 21^b which carry the inking roller chains 22 is mounted in shifting boxes 47, as shown in Figs. I and II, which are set forward, as required, by means of screws 48, for stretching the chains.

To support the pivoted frame in horizontal position and relieve the fly wheel shaft of its weight, lugs 49 are provided on the inner faces of the stationary frame 1, and lugs 50 upon the arms 4 of the pivoted frame, which rest upon the said lugs 49, as shown in Fig. II. The outer or free end of the pivoted frame is received and supported by fixed seats or pockets 53, in the stationary frame, and is secured by pivoted clamp screws 54, connected with projections 4^a on the pivoted frame and which are provided with heads 54^a and turned around so as to project their screw portions beneath the seat lugs 53, carrying thumb nuts 55, as shown in Figs. I and II, so as to secure the free end of the pivoted frame. For securing the pivoted frame in vertical position, its lugs 50 are received by lugs 49^a on the fixed frame, and its free end is received by seat lugs 53^a, which are engaged by the clamp nuts 55 on the pivoted clamp screws 54 in the same manner. The movement of the pivoted frame, from horizontal to vertical position, and vice versa, being concentric with the fly wheel shaft 2, which carries the driving pinion 20, it is manifest that the impression movement imparted to the platen will be the same in either position.

For endless roll printing, the paper is carried from a roll, around the shaft forming the axis of the platen-arms, thence beneath the face of the platen, around and over a roller 56, mounted in a sliding rack frame 57, which is run out as far as required by a pair of pinions 58, mounted upon a shaft 59 secured to the platen so as to change the traveling distance of the paper to register the printed impressions properly with respect to the severing knives 70, 71, that is to say a movement of the roller 56, will so change the traveling distance of the paper that the feeding mechanism will feed the web properly to the knives. It is evident that this registering device registers the printed impressions properly with respect to the feeding mechanism and it is immaterial to the operation of this registering mechanism whether the web is fed to a severing device as shown or to a perforating, measuring, folding or other device with which the impression should register. The shaft 59 is rotated by a milled head 60, and clamped in any position in which it is set by means of a screw 61^a at the opposite end, shown in detail in Fig. XVII. The paper is thence carried over an elevated guide roll 62 in the customary manner, and passed between the drawing and stretching feed rolls 63, 64, by which it is delivered after printing to the severing knives. The feed motion is imparted to the rolls 63, 64, by a slotted arm 6^a projecting in the rear of one of the platen arms 6, and carrying a rack-bar 65, adjustable radially therein. The rack bar 65 gears with a pinion 65^a, (Figs. XVI and XXI) keyed on a shaft 65^b on the end of which is fixed a disk 66. This disk carries a pawl 67, (Figs. II and XIV,) which in the forward movement imparts rotation to a ratchet wheel 68, to which is secured a gear wheel 68^a, meshing with a pinion 68^b on the upper feed roll 63, see Fig. I and as shown in dotted lines in Fig. II, so as to impart rotary movement to the said feed roll. In the reverse movement of the arm 6^a, the pawl slips over the teeth of the said ratchet wheel. The adjustment of the arm 65 in the longitudinal slot 66^a in the arm 6^a regulates the length of the feed as required.

In order to arrest the movement of the feed rollers when printing sheet, card or other job work, a pivoted dog 67^a, mounted on the disk 66 is turned so as to depress the heel of the pawl 67, and hold its point out of engagement with the ratchet wheel.

The connection between the clamp screw 69 of the arm 6^a and the rack bar 65 is by means of the longitudinal slot 66^a in said rack bar, indicated in Fig. II, to provide lost motion in order that the platen may be retracted from the form before the feed movement is imparted to the paper.

The feed roller shafts are made removable, and perforators, cutters, or slitters 63^a are adjusted thereon as required, to provide for the longitudinal severing of the paper along the required lines. To remove the feed rollers,

the pins 150 are withdrawn, and the caps of the boxes are thrown up on their pivots 151. The transverse cutting off of the sheets is effected by a pair of knives, acting shearwise, consisting of an adjustable lower knife 70, which is fixed in operating position, and a reciprocating upper knife 71, having an oblique edge, so as to engage at one end first with the fixed knife 70, and cut shearwise in conjunction therewith, from end to end, which we find advantageous in order to avoid puckering or buckling of the paper. The upper knife 71 is mounted by screws 72 upon a shaft 73, so as to permit a rocking movement which is limited in one direction by a set screw 74, fixed in position in the knife by a jam nut 74^a, and bearing against a fixed stop 75. The knife is constantly pressed in this direction by a spring 76. The edge of the knife 71 being oblique in a horizontal direction to the lower knife 70, is kept in constant contact therewith at the point of intersection, by the action of the spring 76, and the rocking movement permitted by the shaft 73. The shaft 73 is mounted in the ends of a frame consisting of a pair of arms 77 fulcrumed at 78, and having on their rear ends a pair of swinging dogs 79, which rest normally against lugs 79^a in the position shown in Figs. II and III, so that the oblique faces of the said dogs will receive pressure from rollers 80 upon the platen arms 6, as the platen is drawn down to make an impression the effect of which is to throw up the rear ends of the arms 77, carrying down the knife 71, and cutting off the sheet. In the reverse upward movement of the platen arms, the dogs move freely out of the way to permit the rollers 80 to pass, and then immediately drop in front of the said lugs, in readiness for another stroke. The knife is retracted by a spring 71^a.

When it is desired to use the press only for job work, when in vertical position, the dogs 79 may be arranged to fall by gravity, out of operative position.

The paper grippers by which the sheet is held upon the face of the platen, consist of arms 81, mounted to slide on the transverse square shaft 82, and pressed in contact with the platen by a coil spring 83, one end of which engages with the said shaft 82, while the other end is secured to the extremity of a rod 84, pivoted at its other end to a fixed stud 85 on one of the arms of the pivoted frame, as shown in Fig. I. It results from this that when the platen 8 is retracted to the position shown in Fig. V, and indicated in dotted lines in Fig. XV, the upper end of the spring 83 will be thrust forward, rotating the shaft 82, so as to throw the gripper arms 81 away from the face of the platen. It will also be seen that the coiled form of the spring adapts it to yield so that when the parts are in the position shown in Fig. V, the gripper arms 81 may be easily pressed up to the face of the platen by hand, to admit of adjusting them accurately with relation to the form, which ad-

justment is effected by sliding them on their square shaft 82 in customary manner.

We claim as our invention—

1. The combination of the stationary frame provided with lower seat pockets 53, upper seat pockets 53^a upper lugs 49 and lower lugs 49^a the pivoted frame having lugs 50 adapted to rest on the lugs of the stationary frame, the platen form bed and accessories mounted on the pivoted frame, and the clamp screws 54 and nuts 55 for fixing the pivoted frame to the seat-sockets of the stationary frame either in a horizontal or vertical position, substantially as described.

2. In a printing machine, the combination of a stationary frame, main supporting arms, having sockets 29 and lugs 30, and an ink fountain pivoted in the arms, and provided with catches 28 engaging in the sockets to support the fountain in the required horizontal position, substantially as described.

3. In a printing machine, the combination of a feeding mechanism, the platen, the shaft upon which the platen is hinged and which forms a guide roller for the paper, the frame adjustable on the platen to register the printed impression properly with respect to the feeding mechanism and carrying a roller under and over which the paper is drawn, and the upper roller; substantially as and for the purpose set forth.

4. In a printing machine, the combination of a feeding mechanism, the platen, the shaft upon which the platen is hinged, and which forms a guide roller for the paper, the sliding rack-frame, mounted on the platen and carrying a guide roller, the shaft mounted on the platen, having pinions meshing with the racks of the rack-frame, a milled head, and a screw, and the clamp nut; substantially as described.

5. In a printing machine, the arms 6 a platen 8, mounted upon the arms 6, one of the arms being provided with a slotted radial arm 6^a, in combination with the rack bar 65, mounted adjustably in said radial arm, the feed rolls 63, 64, and suitable connections substantially as set forth, with the feed rolls 63, 64, for imparting variable feed to the paper.

6. The automatic cutting device, consisting of suitable knives 70, 71, one of them mounted in a rocking frame 77, in combination with platen arms 6, and means substantially as herein described, for actuating the rocking frame 77, by the movement of said platen arms.

7. The combination of the knives, the rocking frame 77, pivoted dogs 79, provided with oblique faces, and the platen arms 6, having studs 80 engaging with the oblique faces of the pivoted dogs 79 to operate the cutting device in one movement of the platen and pass freely beneath the pivoted dogs in the return movement, substantially as set forth.

8. In combination with the platen 9, and its carrying arms 6, the grippers 81 mounted upon a square shaft 82, the spring 83, and the

operating rod 84 pivoted to a stud 85 eccentrically to the movement of the platen, so as to operate the said grippers automatically, substantially as described.

- 5 9. A printing machine, constructed substantially as herein described, with a frame carrying the form bed, platen and inking apparatus, mounted to turn upon the fly wheel axis, from horizontal to vertical position, and
10 vice versa, and having a driving pinion 20 and sprocket wheel 21 on the fly wheel shaft gearing with the crank wheel 13, and inking roller chains 22, so as to operate the printing and inking apparatus in either position of the
15 bed, as explained.

10. The combination of the main supporting arms, the ink fountain 24, the supply roll 25 having ratchet wheel 25^a, the pivoted arm 52, the pawl 51 carried by the pivoted arm, the draw spring 51^a connected with the piv- 20
oted arm, the sprocket-wheels, the chains, carried by the wheels, having inking rollers, and the pin 21^c on one of the wheels for imparting pressure on the pivoted arm against the action of the spring; substantially as described. 25

WM. M. GERKEY.

AUGUST MAYERHOFF.

In presence of—

A. M. EBERSOLE,

G. E. EBERSOLE.