

(No Model.)

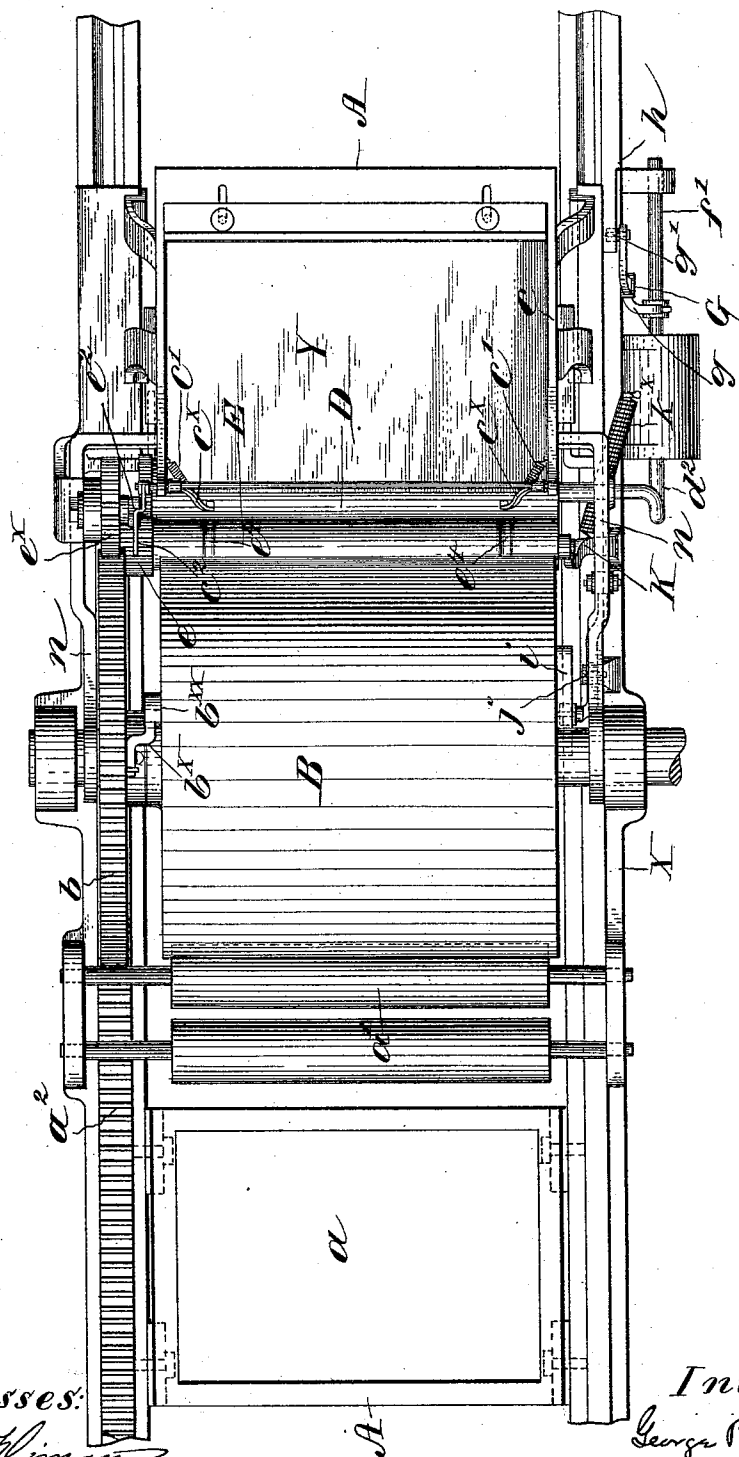
4 Sheets—Sheet 1.

G. R. CLARKE.
FEEDER FOR PRINTING MACHINES.

No. 530,089.

Patented Dec. 4, 1894.

FIG. 1.



Witnesses:

J. M. Winan
Peter A. Ross

Inventor:

George R. Clarke
by *Henry Connelley*
his Attorney

(No Model.)

4 Sheets—Sheet 2.

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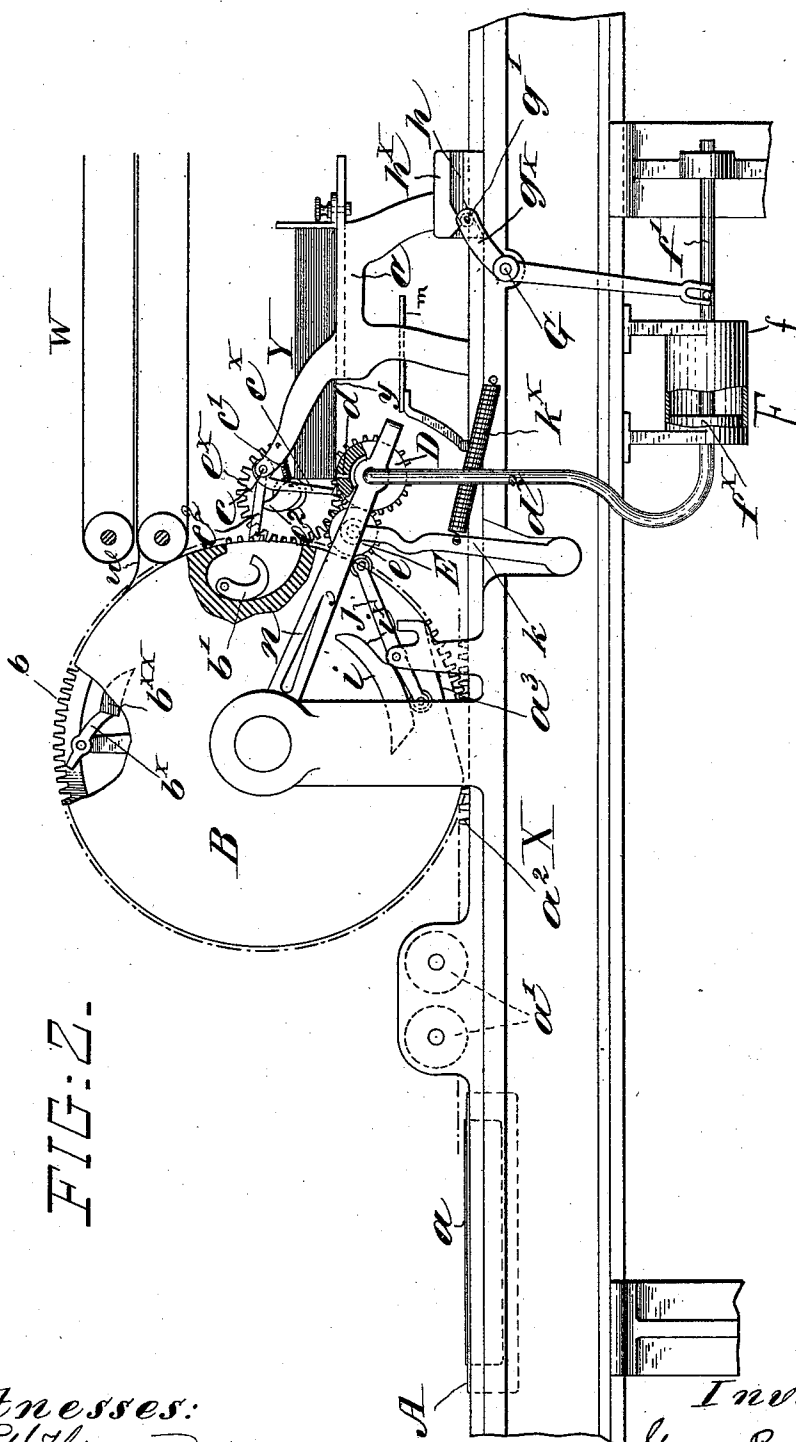


FIG. 2.

Witnesses:
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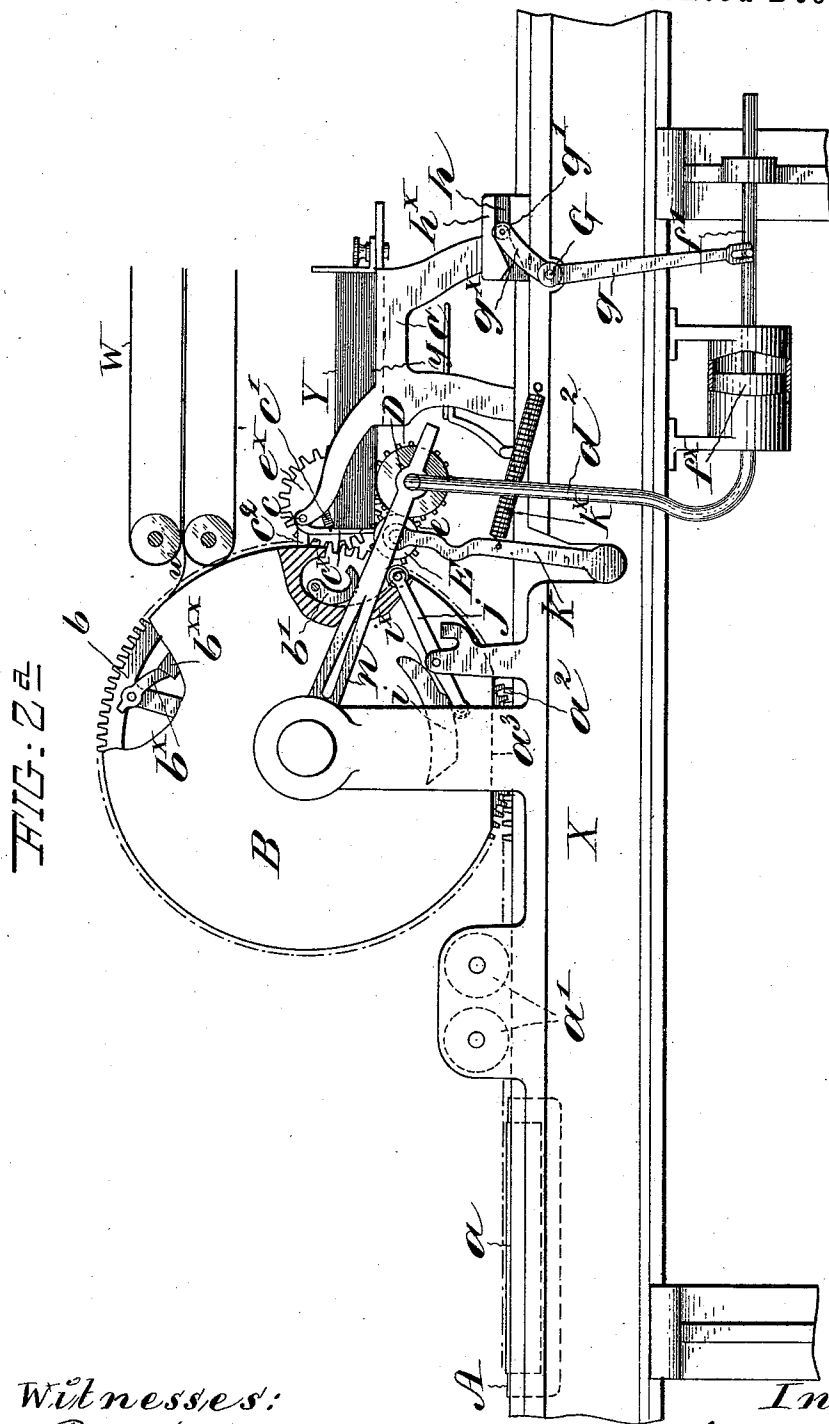
(No Model.)

4 Sheets—Sheet 3.

G. R. CLARKE.
FEEDER FOR PRINTING MACHINES.

No. 530,089.

Patented Dec. 4, 1894.



Witnesses:
F. W. Winman
Peter A. Ross.

Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE R. CLARKE, OF MONTEL, TEXAS, ASSIGNOR TO THE DANBURY
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FEEDER FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 530,089, dated December 4, 1894.

Application filed April 15, 1893. Renewed May 3, 1894. Serial No. 509,993. (No model).

To all whom it may concern:

Be it known that I, GEORGE R. CLARKE, a citizen of the United States, and a resident of Montel, Uvalde county, Texas, have invented certain new and useful Improvements in Feeders for Printing-Machines, of which the following is a specification.

My invention relates to the class of cylinder printing machines, and the object is to supply the sheets and print them automatically, as will be fully hereinafter described.

In the accompanying drawings I have shown my invention embodied in a printing machine having a reciprocating bed for the form and a cylinder arranged over said bed and adapted to rotate intermittently in one direction. The cylinder makes one rotation when the bed moves forward and stands stationary while the bed moves back. The pile of blank sheets is carried by the reciprocating bed and advances with it, and during the latter part of the rotation of the cylinder, a sheet is seized and segregated from the pile on the advancing bed, by suitable feeding rollers. When the bed moves back, the pile of sheets thereon is carried back with it, leaving the segregated sheet in the grip of the feeding rollers. At the next forward movement of the bed, the first effect is to drive the sheet held by the rollers farther through the same, and cause the rollers to swing about in such a manner as to place the end of the sheet in position to be seized by the grippers. These latter seize it and carry it on over the form.

In the accompanying drawings I have illustrated an embodiment of the invention.

Figure 1 is a plan of the major portion of the machine, showing the bed advanced nearly to the end of its forward stroke. The delivery mechanism is omitted from this view. Fig. 2 is a side elevation of the machine showing the moving parts in the same position as in Fig. 1. In this view some of the parts are broken away to better illustrate the construction. Fig. 2^a is a view similar to Fig. 2, showing the positions of the parts when the bed has advanced to the end of its forward stroke. Fig. 3 is a side elevation showing the positions of the parts when the bed has started on the forward stroke and the grippers have just

closed on the sheet. The air-exhausting mechanism is omitted from this view to avoid repetition. Fig. 4 is a detail view, on a larger scale than the principal figures, showing the ratcheting of the gear-wheel on the pinch-roller.

As some of the mechanisms employed herein are or may be the same as those in common use in printing machines, I have not deemed it necessary to minutely illustrate and describe them. Such mechanisms will be indicated in the description.

A represents a reciprocating bed of a printing machine and *a* the form of type locked thereon. This bed may be mounted on rollers or in slides, and it may be reciprocated by any one of the many devices found in this class of machines. The inking rollers are seen at *a'*.

B is the impression cylinder, mounted rotatively in a suitable frame X, over the bed A and driven therefrom through the medium of a rack, *a*², on the bed, and a toothed wheel, *b*, on the journal of the cylinder. In order that the cylinder may be rotated only during the forward movement of the bed, the toothed wheel *b* is mounted loosely on the journal of the cylinder and carries a dog or pawl, *b*^x, which engages a shoulder *b*^{xx} on the cylinder and rotates the cylinder forward. In the cylinder is mounted the usual set of grippers, *b'*, which may have any one of the usual devices for opening them at the delivery point and closing them at the feeding point.

I have not deemed it necessary to illustrate the grippers in detail, nor to show the devices for operating them, as these are well known. The cylinder is flattened at *a*³ to allow the form to pass under it on the backward movement of the bed.

On the bed A is mounted a support, C, for the pile of sheets, Y. This support, and the sheets thereon, are carried up to the cylinder B, on the forward movement of the bed, and away from the cylinder on the backward movement of the same. Near the cylinder B, over the bed, is mounted an exhaust roller, D, and a pinch roller, E, which bears on the roller D peripherally. The roller E is driven from the gear wheel *b*, on the cylinder journal or shaft, through the medium of a gear

wheel, e , ratcheted on the journal of the roller E, and an intermediate stud wheel, e^x , on the frame X. The roller E drives the roller D through gear wheels on their respective journals, in a well known way.

When the pile of sheets Y has advanced to the position seen in Fig. 2,—that is, when the front end of the bottom sheet of the pile shall have been brought over a row of perforations, d , in the hollow roller D,—the air will be exhausted from said roller by an air-exhauster F. (See Fig. 2.) This air-exhausting device may be constructed in many ways. As here shown it comprises a cylinder f , secured to the frame X and connected at one end by a flexible tube, d^2 , with the roller D, through one of the journals thereof. It has a piston f^x , and a piston-rod f' . The piston is drawn back to exhaust the air, by means of the device I will now describe. Fulcrumed on the frame X, is a lever G, the lower, pendent arm, g , of which has a fork which engages a pin in the piston-rod f' . The shorter, upper arm, g^x , of the lever has in it a stud g' , which engages a V-shaped cam-groove, h , in a block h^x secured on the bed A. When the bed A advances, the stud on the lever enters the front end of the cam-groove h , and when the sheets approach the position seen in Fig. 2, the exhaust takes effect and the atmospheric pressure causes the lowermost sheet of the pile to adhere to the roller D. The pile continues to move forward over the rollers but the forward end of the lowermost sheet is carried down into the bite of the feed rollers.

When the bed shall have reached the end of its forward stroke, (see Fig. 2^a) the cylinder ceases to rotate and the bed moves back, carrying the pile of sheets with it, but leaving the bottom sheet y gripped between the now stationary feed-rollers. The movement of the pile of blanks forward over the rollers after a sheet has been seized will only suffice to carry the forward end of the sheet seized a little way through between the rollers, when they cease to rotate and the bed moves back. This is effected by the ratcheting of the gear-wheel e , on the journal of the roller E, as illustrated in Fig. 4, which shows an end view and an axial section of the ratchet and gear-wheel. In this view, e' is the shaft on which the roller E is fixed, and e^4 is a ratchet-wheel also fixed on this shaft and within a hollow formed in the outer end of the wheel e . On the end of the wheel e , is mounted a spring-pawl e^3 , the nose of which engages the ratchet. This ratchet device is a common one and its operation will be understood without further explanation.

In front of the pile of sheets Y, on the support C, is mounted a rocking bar, c , from which depend one or more hooks, c^x , in front of the pile. These hooks take under and help to support the projecting front end of the pile and to even it up. They are held up in place, normally, by a spring or springs, c' . When the pile of sheets advances to nearly the position

seen in Fig. 2, the hooks c^x are swung back so as to free the bottom sheet, by means of a spring arm, c^2 , on the rocking bar c which rides over a cam, e^2 , on the stud which carries the wheel e^x . This spring arm is bent laterally, as seen in Fig. 1, so that after the bend in the same passes beyond the cam, the arm is free to drop and allow the hooks to again take under the front end of the pile of sheets. When the bed moves back, the spring arm wipes by the cam e^2 , and is not raised thereby. The roller D, in the meanwhile, will have been lowered (as will be hereinafter explained) so that the hooks may pass freely over it. I may say here, that when the bed moves back, the vacuum will be broken by the passage of the stud through the V-shaped cam groove in following the same path before traversed by it. In order that the lower ends of the hooks c^x may not strike the roller E when the parts are in the position seen in Fig. 2^a, the said roller has in it shallow circumferential grooves, e^4 , (seen in Fig. 1,) arranged to register with the said hooks.

I will now describe the manner in which the feed-rollers are mounted.

The exhaust-roller D is rotatively mounted in the outer ends of two connected arms, n , (one only is seen in the side view) which swing radially about the journals of the cylinder B. The weight of the roller D will suffice to cause it to descend by gravity from the position seen in Fig. 2 to that seen in Fig. 3. When in the position seen in Fig. 2, the roller is upheld by a cam, i , on the end of the cylinder, through the medium of a lever j , fulcrumed on the main frame. The cam depresses one arm of this lever and the other arm takes under one of the two connected arms n , and thus raises the roller. At substantially the moment the bed A reaches the end of its forward movement, a depressed or recessed part, i^x , of the cam i comes to register with the end of the lever j which bears thereon, and this allows the roller D to drop or descend a little so that the hooks c^x may pass back over it. This is the position in which the cylinder and feed-rollers stand while the bed is moving back. The roller E is mounted rotatively in the upper ends of rocking supports k , and it is held in gear with the roller D by a spring k^x . As soon as the bed starts on its forward movement, the cylinder and feed-rollers begin to rotate, thus driving the sheet y farther through the rollers and at the same time bringing the grippers on the cylinder into position to seize it; and when the rotation of the cylinder carries the cam i clear of the lever j , the roller D descends to the position seen in Fig. 3, the roller E taking also the position seen in this figure. The effect of this movement of the rollers is to change the direction of movement of the forward end of the sheet y , and to drive it into the grippers on the cylinder which instantly close on it and carry it on. When the sheet reaches the delivery point w , it will

be taken from the cylinder by some form of delivery mechanism W.

The delivery mechanism forms no proper part of my invention, and is merely represented diagrammatically herein. Any kind of mechanism may be employed for this purpose.

When the bed nears the position seen in Fig. 2, moving forward, the cam *i* on the cylinder will come into play and raise the roller D under the advancing end of the pile of sheets Y, ready to seize another sheet. When the bed A moves back, the segregated sheet *y* will be held up by a suitable support *m*.

It is essential that the gear-wheel *e* shall always remain in gear with both the wheel *e*^x and the gear-wheel on the roller D, and this is effected by making the teeth on the wheel long as indicated in the enlarged view of the wheel *e* in Fig. 4. This construction enables the gear-wheel *e* to shift from the position seen in Fig. 2 to that shown in Fig. 3 without the ends of the teeth on the wheel *e* striking the bottoms of the spaces between the teeth on the wheel *e*^x when the centers of said wheels are in a line with the pivotal axis of the arms *k*. If desired, the arms *k* can be made much longer than as shown herein so as to flatten the arc through which the wheel *e* moves and thus maintain a nearer approach to co-incidence of the pitch circles of the gears, but this latter is not essential. So long as the teeth remain in gear and the wheels do not bind in shifting, the mechanism will perform its proper functions.

Having thus described my invention, I claim—

1. In a machine for the purpose specified, the combination with the cylinder having grippers, the feed-rollers, revolving in unison therewith, a moving type carrying bed, a re-

ciprocating support for the sheets, adapted to carry the free, advancing end of the pile of sheets over the main, exhaust feed-roller as the cylinder rotates, and means substantially as described for exhausting the air from the main feed-roller while the bottom sheet is over the holes in the same, as set forth.

2. In a machine for the purpose specified, the combination with the cylinder having grippers, the reciprocating bed which drives the cylinder, and the support for the sheets mounted on and moving with said bed, of the feed-rollers, rotating in unison with the cylinder, means for exhausting the air from the main feed-roller at the moment the advancing end of the pile of sheets is over the holes in the roller, whereby the latter is caused to seize the bottom sheet, and means substantially as described for holding back the sheets of the pile while the lowermost sheet is being drawn out by the rollers, as set forth.

3. In a machine for the purpose specified, the combination with the cylinder having grippers, the feed-rollers revolving in unison therewith, means substantially as described for raising and lowering the exhaust feed-roller whereby the direction of movement of the sheet is changed, means for exhausting the air from said roller, and a reciprocating support for the pile of sheets arranged to move in unison with the said rollers and to advance the forward end of the pile of sheets over the exhaust feed-roller, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GEO. R. CLARKE.

Witnesses:

JOHN OSBORNE,
JABEZ AMSBURG.