(No Model.) 2 Sheets—Sheet 1.

W. F. KIDNEY.

AUTOMATIC FEEDING APPARATUS FOR PRINTING MACHINES.

No. 455,020. Patented June 30, 1891.

Fig. 1.

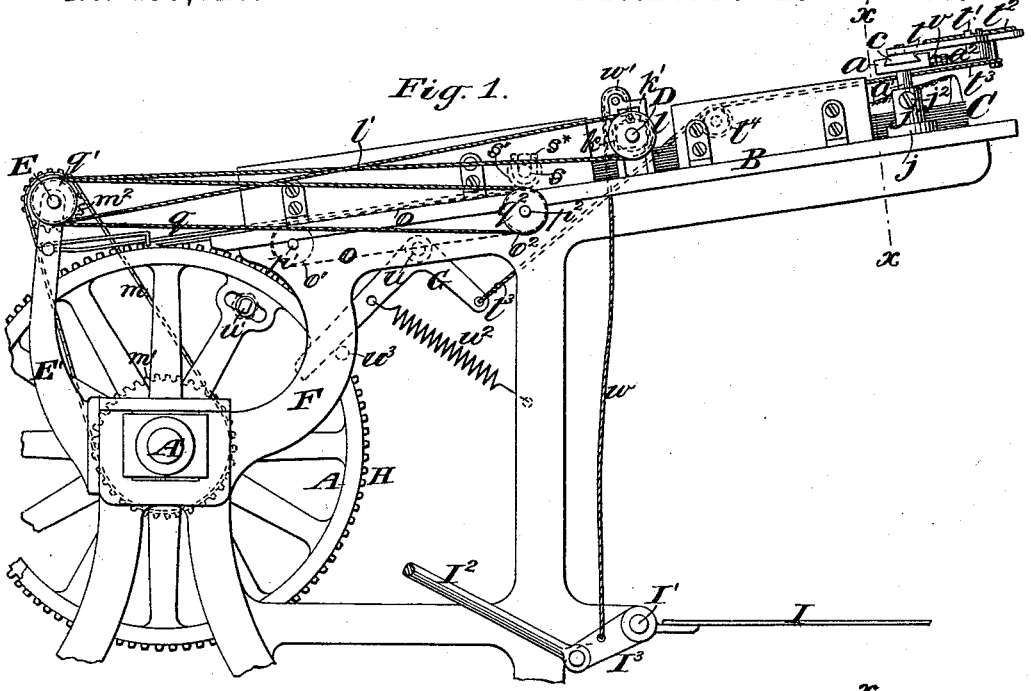
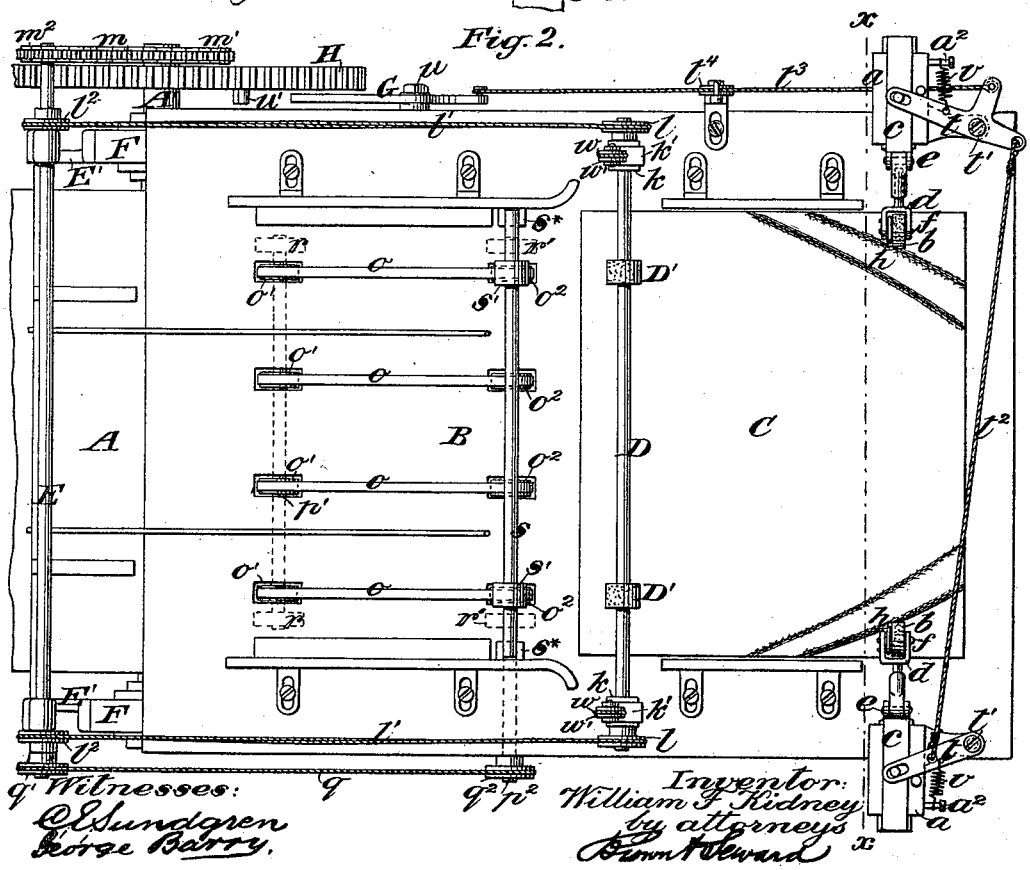


Fig. 2.



Witnesses:
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George Barry.

Inventor:
William F. Kidney
by attorneys
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(No Model.) 2 Sheets—Sheet 2.

W. F. KIDNEY.

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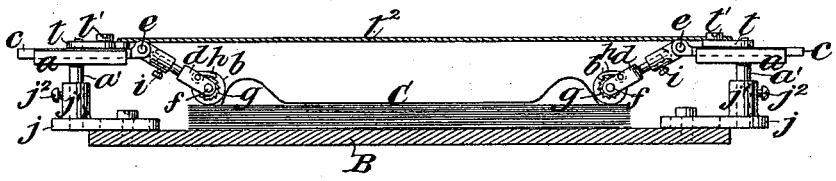
No. 455,020. Patented June 30, 1891.

Fig. 3.



Witnesses:
C. L. Sundgren
George Barry.

Inventor:
William F. Kidney
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Brown & Seward

UNITED STATES PATENT OFFICE.

WILLIAM F. KIDNEY, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO CLARK S. ST. JOHN, OF SAME PLACE.

AUTOMATIC FEEDING APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 455,020, dated June 30, 1891.

Application filed March 6, 1891. Serial No. 383,974. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. KIDNEY, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Automatic Feeding Apparatus for Printing-Machines, of which the following is a specification.

I will first describe the invention with reference to the accompanying drawings, and will afterward point out its novelty in the claims.

Figure 1 represents a side view of those parts of a printing-machine necessary for the illustration of my invention. Fig. 2 is a plan corresponding with Fig. 1. Fig. 3 represents a transverse section taken in the lines $x\ x$ of Figs. 1 and 2.

Similar letters of reference designate corresponding parts in all the figures.

A designates the impression-cylinder, B the feed-table, and C a pile of paper on the said table. On opposite sides of the feed-table, near the rear end thereof and at right angles thereto, are arranged stationary guides $a\ a$, in which run carriages for two friction-rollers b. These rollers have their peripherical faces of some material capable of producing friction. The said faces may be composed of india-rubber, or they may be of hard material faces with fine sand or emery, that they may be capable of biting upon the sheets of paper in the pile C. The carriages consist each, as shown in Figs. 2 and 3, of a horizontal slide c, running in the guides a, and a short forked arm d, pivoted at e to said slide. The friction-rollers b have their journals f fitted to bearings in the fork of the arm d, and each has firmly secured to it a ratchet-wheel g, which is engaged by the teeth of a pawl h, attached to the arm d. The said friction-rollers b are caused by their own weight and the weight of the arms to bear upon the pile of sheets C near their rear corners. If motion be given to the roller-carriages $c\ d$ in an inward and outward direction across the feed-table, the rollers will turn freely and roll over the paper in their outward movement, but during their inward movement they will be prevented from rotation by the action of the pawls h on their ratchet-wheels, and they will drag upon the top sheet of paper and thereby be caused to gather up the said sheet from the edges, as shown in Fig. 3, and so to facilitate its removal from the pile.

The forked arms d are represented as each made in two pieces, one of which pieces is made with a stem to fit a socket in the other piece in such manner as to make the arm adjustable in length within certain limits, and the adjustment is secured by means of a set-screw i.

The guides a of the roller-carriages are represented as made with upright stems a' and fitted to sockets j' on plates j, which are bolted to the feed-table. This provides for the adjustment of the guides and carriages to a suitable height, set-screws j^2 being provided in the sockets j' for the purpose of securing the adjustment.

D is a shaft arranged horizontally above the feed-table, transversely thereto and parallel with the cylinder, the position of the said shaft being about the middle of the length of the feed-table, or over that part occupied by the front part of the pile of sheets C. This shaft is furnished with friction-rollers D', which may be of the same material as the friction-rollers b, hereinbefore described. Its journal-boxes k are fitted to slide up and down in stationary housings k', secured on the feed-table, so that the said rollers may be brought down upon and raised from the pile of paper. The said shaft is furnished at its ends with pulleys l for driving-belts l', which receive constant rotary motion from pulleys l^2 on a shaft E, which is supported in bearings in brackets E', bolted to the main framing F of the machine, the said shaft receiving motion through an endless chain m, running on a chain-wheel m' on the cylinder-shaft A' and on a chain-wheel m^2 on the said shaft. The journal-boxes k and the shaft D are always raised high enough to keep the rollers D' out of contact with the paper, except just after the top sheet of paper has been loosened from the pile by the action of the friction-rollers b, before described, when the said rollers D' are brought down upon the sheet temporarily to start it forward from the pile far enough for it to be taken by other devices, which carry it forward to the cylinder. These other devices in the present example consist of

endless tapes o, running on pulleys o' o^2 on shafts p' p^2, arranged in bearings r r' under the feed-table, the said tapes passing through holes in the feed-boards and their upper runs being slightly above the level of the feed-table. The said tapes are driven from the shaft E', before mentioned, through an endless band q, which runs on a pulley q' on the said shaft E and a pulley q^2 on the said shaft p^2. Over the tape-roller shaft p^2 a shaft s is arranged in bearings s^* above the feed-table, and this shaft is furnished with rollers s', which are situated over certain of the tape-rollers o^2 and opposite the rollers D', before mentioned, the said rollers s' serving to confine the sheets to the tapes.

For the purpose of effecting the movements of the roller-carriages c d, the said carriages are represented as connected with levers t, working on fixed fulcrums t', which are connected together by a cord or rod t^2 in such manner that both will move inward together. This movement is produced by a connection of one of the said levers—viz., that shown in the upper part of Fig. 2—by a cord t^3, running over a guide-pulley t^4 on one side of the feed-table, with a third lever G, which works on a fixed fulcrum u on one side of the feed-table, this third lever before operated upon at the proper time to move the carriages and friction-rollers b inward by means of a tappet-stud u', secured in one of the cylinder-gears H. The said lever G is drawn back to a fixed stop u^3 after the action of the tappets u' upon it, by means of a spring u^2, which connects it with the framing. The outward movement of the friction-rollers b and their carriages is produced by springs v v, which connect the levers t with studs a^2 projecting from the guides a.

In the machine represented the sheets are intended to be delivered from the cylinder at the back thereof under the feed-table by means of a fly I, arranged in a well-known manner on a rock-shaft I', driven through a rod I^2, connected with one of two arms I^3 on the said rock-shaft. As these parts are well known they need no further description. They are only here represented for the purpose of showing a convenient method of producing the upward and downward movements of the journal-boxes k, shaft D, and rollers D', for which purpose the said boxes are connected with said arms I^3 by cords w passing over pulleys w' on the housings k'. When the fly I is at rest waiting for the sheet, the arms I^3 are depressed and the journal-boxes k, shaft D, and rollers D' are raised clear of the pile of paper; but at the time the fly is thrown back to deliver a sheet, which occurs at the same time that a new sheet is to be started forward from the pile, the upward motion of the said arms I^3 of the fly rock-shaft permits the rollers to be brought by their own weight and that of the shaft and its boxes down upon the sheet for a sufficient length of time to start it forward.

The operations of the several parts of the feeding apparatus having been separately described, it will be sufficient to refer briefly, in conclusion, to the order in which the said operations take place, which is as follows: The friction-rollers b, which have been resting upon the top sheet of the pile close to its side edges, are first moved inward with their carriages very quickly and returned even more quickly, and, being prevented from turning in their inward movement, they gather up the edges of the sheet, as illustrated in Fig. 3, and loosen it from the pile, the rollers D' being in the meantime raised. This gathering-up operation of the rollers b is immediately followed by the descent of the constantly-rotating shaft D and its rollers D', which take the loosened sheet and feed it forward far enough to be taken by the tapes, which carry it onward to the cylinder. The rollers b in their return movement roll off the edges of the loosened sheet and over the face of the sheet next below it and come to rest on the latter sheet close to the edge thereof, where they remain in readiness to advance at the proper time and gather up the next sheet in the same way.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the impression-cylinder and feed-table of a printing-machine, and friction-rollers and carriages therefor arranged to move inward and outward across the said table, of spring-actuated levers, one for each carriage, and a connection, substantially as herein described, between the said levers, a third lever connected with one of the two first-mentioned levers, and a tappet on the cylinder operating upon said third lever to produce the movements of the said carriages and friction-rollers, all substantially as and for the purpose herein set forth.

2. The combination, with the feed-table of a printing-machine, and a delivery-fly and a rock-shaft for the same under the said table, of a shaft arranged transversely to and above the table and furnished with friction-rollers, journal-boxes for the said shaft, and a connection, substantially as herein described, between said boxes and the said rock-shaft for the purpose of lifting said boxes, substantially as herein set forth.

WILLIAM F. KIDNEY.

Witnesses:
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CLARK S. ST. JOHN.