F. H. LAUTEN.

Paper-Feeding Apparatus.

No. 208,980. Patented Oct. 15, 1878.

Fig. 1.

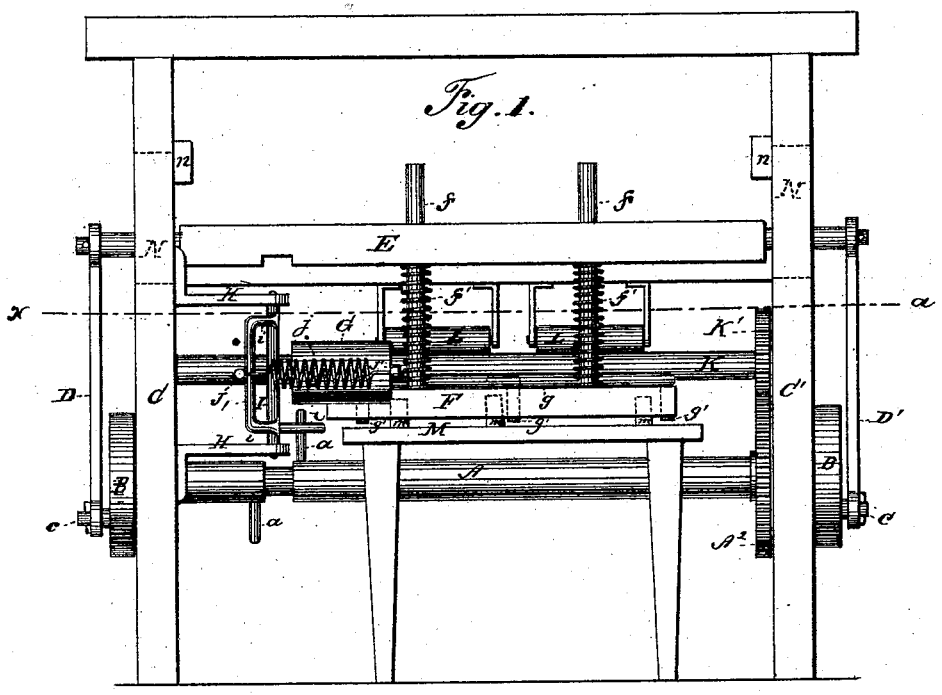


Fig. 2.

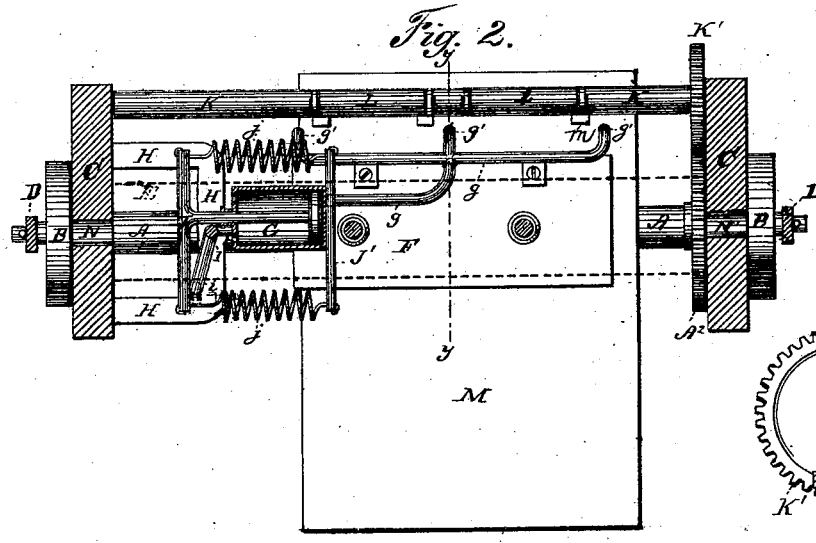
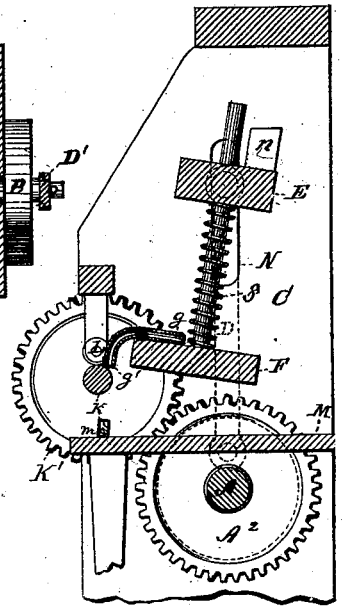


Fig. 3.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN PAPER-FEEDING APPARATUS.

Specification forming part of Letters Patent No. **208,980,** dated October 15, 1878; application filed June 17, 1878.

To all whom it may concern:

Be it known that I, FRANK H. LAUTEN, of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Paper-Feeding Apparatus for Printing-Presses, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention consists in an improved apparatus for automatically feeding sheets of paper singly to the printing mechanism of a printing-press or to a folding-machine, or ready-cut blanks to the forming and shaping apparatus of machines for making paper boxes or bags, and other analogous machines which require to be supplied singly with sheets of paper or any other material, the services of a person to feed being dispensed with. This object I effect by means of mechanism hereinafter described, combined with an air-pump, which lifts the sheet from the pile, in connection with rollers which carry it forward to the grasping devices of the printing-press or other machine.

Figure 1 in the drawings is an elevation, the feed-table being toward the spectator. Fig. 2 is a horizontal section on the line *x a* of Fig. 1; Fig. 3, a vertical section on the line *y y* of Fig. 2.

A is a shaft, rotated by connection with the printing-press or otherwise, in such a way as to operate in harmony with said press, so that a sheet may be lifted and presented to the action of the gripers, and carried forward by them at the proper moment to receive an impression.

B B are wheels affixed to the ends of the shaft A, exterior to the standards C C′ of the apparatus, and having crank-pins *c c*, which are connected by rods D D′ to the cross-head E, which is supported by said rods, having journals fitting into bearings at the upper ends of said crank-rods.

F is a plate attached to stems *f f*, passing through the cross-head E. These stems are surrounded by springs *f′ f′*, which act to depress said plate when it is not lifted in the manner hereinafter described. On this plate the air-pump G is secured. This has an opening at the outer end, and is provided with an air-suction pipe, *g*, having a number of branches, *g′ g′ g′*, whose open outer extremities are bent downward, and terminate at points immediately over the edge of the pile of paper, nearly in line with the stops *m m*.

H is a frame affixed to one of the standards, and serving as a support for the vertical rock-shaft I. This rock-shaft has horizontal arms *i i*, set at suitable angles to be struck by the tappets *a a* on shaft A, in order to produce the outward movement of the piston of the air-pump G.

J is a movable cross-head, to which the piston-rod of the air-pump is attached; and J′, a fixed cross-head, to which springs *j j* are attached, said springs being also attached to the extremities of the movable cross-head J, producing the inward movement of the air-pump piston.

A^2 is a gear-wheel on the shaft A, meshing with the wheel K′ on the feed-roller shaft K.

L L are the upper feed-rollers. A space is left between these upper rollers to let the downward-bent ends of the suction-pipe pass.

The operation of the apparatus is as follows: A pile of paper having been laid on the feed-table M, the springs *f f* cause the plate F to exert a moderate pressure on the paper. When the mechanism is set in motion the crank-rods D D lift the cross-head E, which moves in slots N and raises the plate F from the pile. The rotation of the shaft A, which causes this movement, also presses one of the tappets *a a* against one of the arms *i i*, producing a partial rotation of the rock-shaft I and drawing out the piston of the air-pump, causing a vacuum in said pump and the pipes *g′ g′ g′*, which lifts the edge of the uppermost sheet of paper and carries it upward until it is in position to be caught between the feed-rollers K L L. The limit of said upward motion is determined by stops *n n*, near end of slot N in standards C C. When the plate has arrived at its uppermost position it becomes slightly tilted by striking against the stops, and the sheet is in position to be caught by the feed-rollers, which deliver it to the gripers of the printing-machine. At the same

time the arm *i* becomes freed from the tappet *a*, and the springs *j j*, acting on the cross-head J, cause a rapid reverse movement of the piston, and the edge of the sheet, being relieved from the preponderating atmospheric pressure beneath, falls into a position to be caught by the feed-rollers. The plate again descends under the operation of the springs *f' f'*, and the operation is repeated as before.

The stops *m m* are preferably made or faced with rubber or other rough-surfaced material, which, by its friction against the ends of the sheet, will tend to prevent more than one sheet being lifted at a time, should they accidentally adhere together.

I also prefer to have movable stops at the opposite or outer end of the feed-table, which may be moved inward to press against the end of the pile, no matter what will be the size of the sheet, so that the opposite edge, or that to be lifted, may be kept up to the stops *m m*, and remain undisturbed by vibration of the press or otherwise, in proper position for the action of the pipes *g' g' g'*.

I claim as my invention—

1. The combination of the reciprocating rock-shaft E, plate F, carrying pipes *g g'*, air-pump G, fixed cross-head J', movable cross-head J, springs *j j*, vertical rock-shaft I, having arms *i i*, and shaft A, having tappets *a a*, substantially as described.

2. The combination of the shaft A, tappets *a a*, rock-shaft I, arms *i i*, springs *j j*, cross-heads J J', air-pump G, suction-tubes *g g'*, plate F, stems *f f*, springs *f' f'*, and reciprocating rock-shaft E, substantially as specified.

3. The combination of the feed-table M, shaft A, reciprocating rock-shaft E, wheels B B, crank-rods D D', standards C C', provided with slots N N, plate F, air-pump G, pipes *g g' g' g'*, frame H, rock-shaft I, cross-heads J J', and springs *j j*, substantially as specified.

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Witnesses:
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