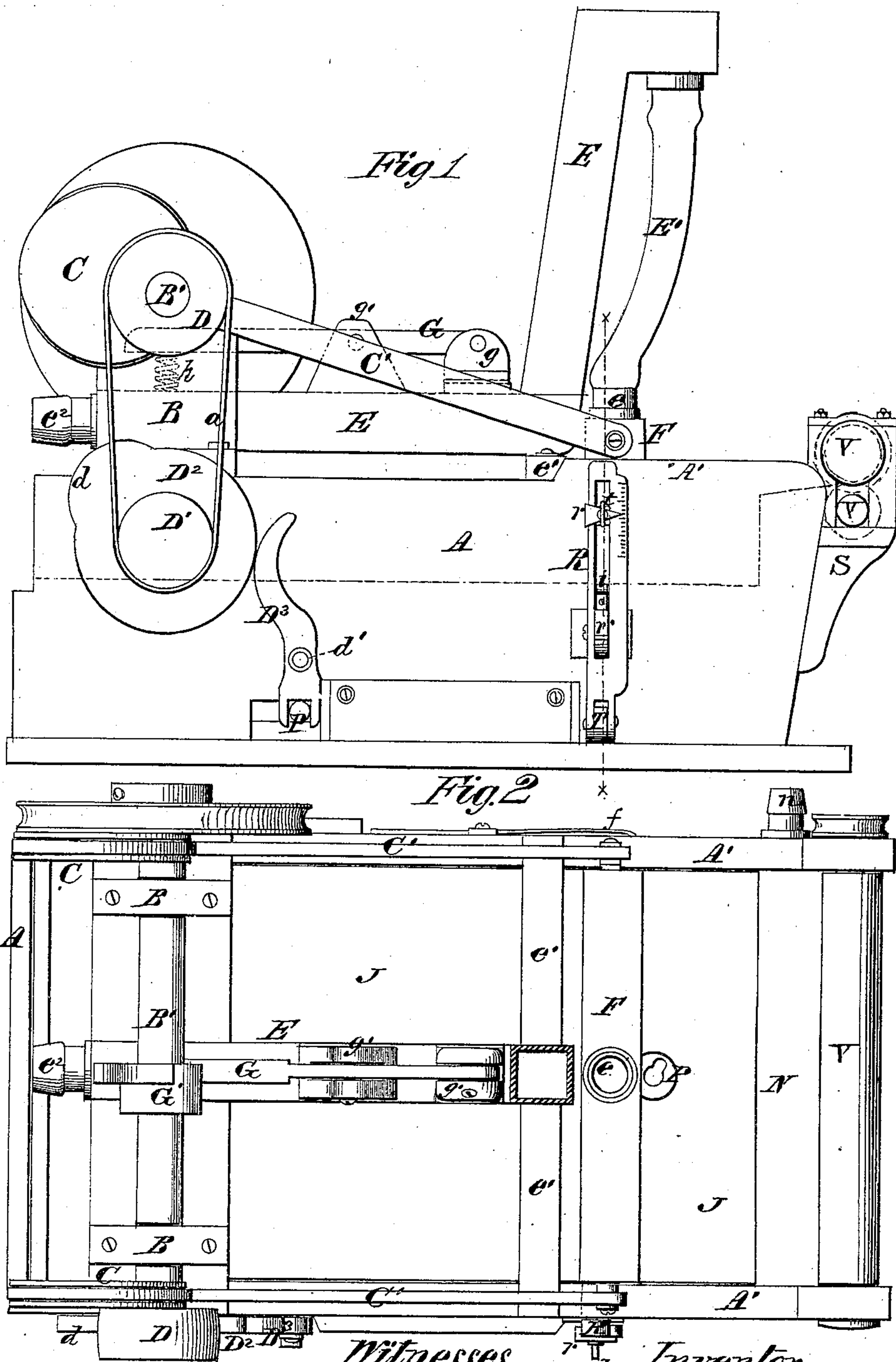


J. T. ASHLEY.  
PAPER FEEDING APPARATUS.

No. 107,320.

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Witnesses  
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# United States Patent Office.

JOHN T. ASHLEY, OF BROOKLYN, E. D., NEW YORK.

Letters Patent No. 107,320, dated September 13, 1870.

## IMPROVEMENT IN PAPER-FEEDING APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN T. ASHLEY, of the city of Brooklyn, E. D. in the county of Kings and State of New York, have invented a new and Improved Paper-Feeder; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1, plate 1, is an elevation of one side of my improved feeder.

Figure 2, plate 1, is a top view of the machine, with the upper portion of the air-trunk removed.

Figure 3, plate 2, is a vertical section taken longitudinally and centrally through the machine.

Figure 4, plate 2, is a horizontal section taken through the frame of the machine below the vertically-movable table, showing the mechanism by which this table is raised and lowered.

Figure 5, plate 3, is a section taken vertically and transversely through the machine, in the plane indicated by dotted line in fig. 1.

Figure 6, plate 3, is a perspective view, showing the graduated lever, its adjustable pointer and tooth, and also the toe or projection which is applied to the vertically movable table for acting against the said tooth.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements on machinery, which is adapted for feeding sheets of paper, one at a time, to a printing-press, calendering-machine, and other machines requiring to be fed with sheets of paper.

The nature of my invention consists—

First, in constructing the bottom of the suction-box with a curved or waved surface, perforated, and thus adapted for picking up and holding each top-most sheet so as to effect a more positive separation of the same from the succeeding lower sheet, by allowing air to enter between them, as will be hereinafter explained.

Second, in providing for automatically elevating the table upon which the pile of paper is supported, in a given ratio with respect to the removal of the sheets, and in combining therewith certain means for stopping the further ascent of the table when the sheets have all been removed, and also for depressing the table again to receive upon it another pile, as will be hereinafter explained.

Third, in combining a registering scale and pointer with the table of a paper-feeder, in such manner that, by a simple adjustment, the ascent of the table can be caused to stop automatically, at any desired point of elevation, according to the height of the pile or number of sheets contained therein, as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings—

A represents a rectangular frame, within which is arranged a vertically movable horizontal table, J, on which the pile of sheets, to be fed from the machine, are supported.

Above this table, and at one end of frame A, are standards, B B, which afford elevated bearings for a horizontal transverse driving-shaft, B'.

To the ends of this shaft grooved eccentrics C C are keyed, which receive around them the yokes which are on the rear ends of pitman-rods, C' C'.

The rods C' C' are extended forward and downward, and are pivoted to the ends of a horizontal transverse box, F, which I shall term the suction-box, and which is guided in ways A' A', so as to receive a horizontal reciprocating motion. This suction-box F, is constructed with a perforated waved bottom, as shown in fig. 5, plate 3, for a reason to be hereinafter explained, and it is in communication with the elevated overhanging end of a trunk or pipe, E, by means of a flexible pipe, E', applied at its lower end over a nozzle, e.

The trunk E is carried backward beneath the shaft B', and is suitably connected with an exhausting-fan or engine of any desired description, whereby a continuous exhaustion of air can be maintained through the box F.

Any other convenient arrangement of the trunk E may be adopted.

At a suitable point, a hole is made through the trunk E, and provided with a valve, g, for tightly closing it against the ingress of air. This valve is applied to one end of a lever, G, which has its fulcrum at g', and which extends beneath the shaft B', and beneath a cam-segment, G', on this shaft.

The cam-segment is adjusted in such relation to the movements imparted to the suction-box F, by eccentrics, C C, and pitman-rods, C' C', that this cam will lift the valve at the proper moment for delivering a sheet of paper between the rollers V V, and thus cause a release of the sheet from said box. Valve g will then close, by the recoil of a spring, h, on its lever G, and remain closed until the box F, again reaches a point in its forward stroke for delivering another sheet between the rollers V.

The two rollers V V, which may be employed for carrying off the sheets from the machine, are supported by bearings, S S, applied to the front end of frame A, and are arranged so that their bite is in or nearly in a horizontal plane coinciding with the plane of the bottom of the box F. Other contrivances suitable for gripping the sheets and carrying them off, may be adopted instead of the said rollers.



Between the rollers  $V$  and the suction-box, when in the positions shown in fig. 1, I arrange a blast-chamber,  $N$ , into which air is forced from any suitable engine, through the nozzle  $n$ . This chamber extends transversely across the frame, and has a narrow outlet through which air, in a thin sheet, is expelled backward. The current of air is thus caused to act upon the paper to assist in the operation of separating each top sheet from the pile.

The suction-box  $F$  is constructed with a waved or curved bottom surface, as shown in fig. 5, which will present a greater length of surface over the pile of paper than would be the case if the said bottom surface was flat or parallel to the surface of the paper on the table.

This being the case, it is obvious that, during the act of picking up a sheet of paper, the lateral edges of the sheet will be drawn inwardly away from the corresponding edges of the next sheet below, thereby freeing the top sheet. It will also be seen that, by giving each sheet the movement above described at the commencement of the act of lifting it, the blast of air will be allowed between such sheet and the next lower one, which will greatly add to the certainty of separation.

On one end of the shaft  $B$ , a pulley  $D$  is keyed, over which a belt,  $a$ , passes, that communicates rotary motion to a pulley,  $D^1$ , on one side of frame  $A$ .

This pulley  $D^1$  is applied fast to a wheel,  $D^2$ , on the periphery of which is an elevation,  $d$ , which is intended to give a vibrating impulse to a lever,  $D^3$ , once in every rotation of the shaft  $B$ . The lever  $D^3$  is pivoted to frame  $A$ , at  $d'$ , and between its lower forked end is the end of a lever,  $c$ ; this latter lever is arranged in a horizontal plane, acted upon by a spring,  $c'$ , and loosely pivoted to an extension,  $f^2$ , of a slide,  $f^1$ .

The slide  $f^1$  is fitted into a groove made in frame  $A$ , and on the front end of this slide a pawl,  $f$ , is fastened, so as to act upon a pinion-wheel,  $b^2$ .

The teeth of wheel  $b^2$  engage with the teeth of a large spur-wheel,  $b^1$ , and the teeth of this wheel engage with the teeth of a spur-wheel,  $b$ . This wheel  $b$  has, rising centrally from it, a screw,  $M$ , which is received into the female screw-socket  $M'$  that is made fast on the bottom of the table  $J$ , as shown in fig. 3.

A rod,  $j$ , extends transversely across frame  $A$ , beneath table  $J$ , and is arranged in such relation to the pawl  $f$  as to serve as a means for disengaging this pawl from its pinion-wheel  $b^2$ .

One end of rod  $j$  is pivoted to the lower end of a slotted lever,  $R$ , which has its fulcrum at  $r'$ , and which extends from the bottom to the top frame, on one side thereof.

Above the fulcrum  $r'$ , lever  $R$  is slotted for receiving the shank of a vertically adjustable tooth,  $m$ ,

shown in figs. 5 and 6. This tooth passes through a vertical slot which is made through one side of the frame  $A$ , and can be adjusted up or down, and set at any required point on lever  $R$ .

The set-screw  $t$ , and a plate,  $r$ , are used to confine the tooth in place, and the plate  $r$  is tapered at one end, so as to serve as a pointer.

On one side of the lever  $R$ , and on the surface thereof, I mark off a scale, as clearly shown in fig. 6, which scale, with the pointer  $r$ , will indicate the position of the tooth  $m$ , with respect to the height of table  $J$ .

On one side of this table  $J$ , directly in line vertically with the tooth  $m$ , a toe,  $i$ , is fixed, having double beveled surfaces. The inner end of the tooth  $m$  is beveled, so that when toe  $i$  presses against it by the ascent of table  $J$ , this toe will force outwardly the upper end of lever  $R$ , and press rod  $j$  against pawl  $f$ , so as to disengage the latter from its wheel,  $b^2$ , and stop the further ascent of table  $J$ .

The adjustable tooth  $m$ , in combination with the pointer  $r$ , the set-screw  $t$ , and the scale on lever  $R$ , will admit of adjusting the machine for running off any given number of sheets, the upward motion of the table  $J$  ceasing when such number has been run off.

A post or hub,  $P'$ , having a socket in its upper end for receiving a key, rises from the center of wheel  $b^1$ , and directly over this hub a hole,  $P$ , is made through the table, through which a key can be introduced and inserted into the socket in hub  $P'$ .

By turning the key, the pawl  $f$  being disengaged from wheel  $b^2$ , the table  $J$ , can be depressed.

Having described my invention,

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

1. The construction of a suction-box for a paper-feeder, with a perforated waved bottom, substantially as described.

2. The table of a paper-feeder, provided with an elevating and depressing screw, in combination with devices which will automatically stop the ascent of said table at the desired moment, and also with devices which will allow said table to be again depressed to any desired point, substantially as described.

3. A projection,  $i$ , on the table  $J$ , in combination with an adjustable tooth,  $m$ , which is applied to a lever that actuates a pawl to stop the upward movement of the said table, substantially as described.

4. The adjustable pointer  $r$ , applied to the tooth  $m$ , and to a graduated or scale-lever,  $R$ , combined with a paper-feeder, substantially as described.

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Witnesses:

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