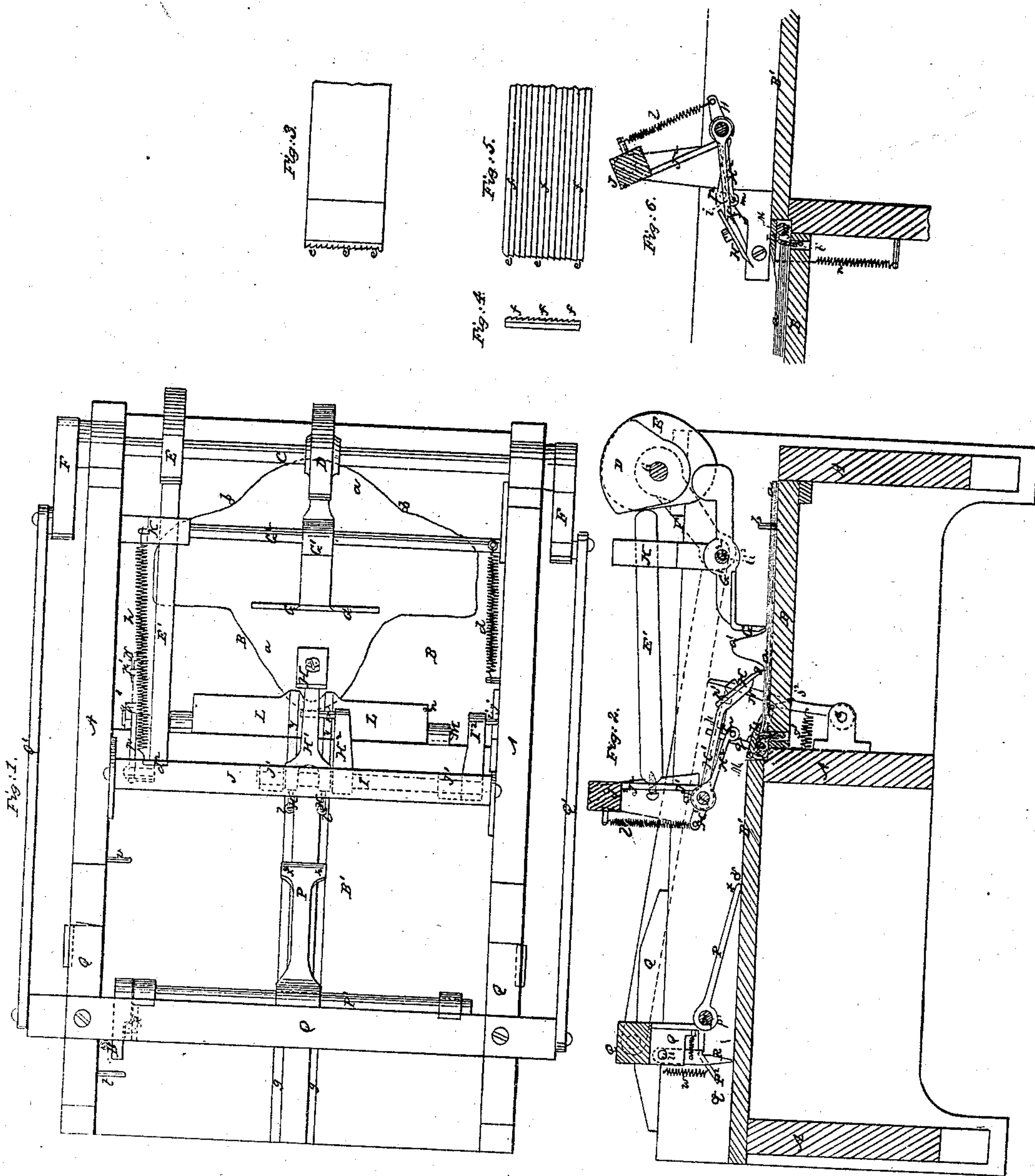


E. Allen.
Paper Feeding Mach.
N^o 39872.
Patented Sept. 15. 1863.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWIN ALLEN, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN PAPER-FEEDERS.

Specification forming part of Letters Patent No. 39,872, dated September 15, 1863.

To all whom it may concern:

Be it known that I, EDWIN ALLEN, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Paper-Feeders for Envelope and other Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan of a feeder for an envelope-machine with my improvements. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a face view, on a larger scale than Figs. 1 and 2, of the blade which loosens the blank, sheet, or piece of paper which is to be fed from that or those below it in a pile. Fig. 4 is an edge view of the said blade. Fig. 5 is an under side view of the same. Fig. 6 is a vertical sectional view of a portion of the machine, seen looking in the opposite direction to Fig. 2. Fig. 7 is a perspective view of the edge of the blade which loosens the blank on a larger scale than Figs. 3, 4, and 5.

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

This invention consists in the employment, for loosening the blank, piece, or sheet which is to be fed from those which are below it in a pile, of a blade having an edge of peculiar form, whereby it is made to take hold of the paper with greater certainty; also, in a peculiar mode of applying a blade for the above purpose, whereby it is enabled to adapt itself to the level of the top of the pile, and to any inaccuracies in its operating machinery, and always to press uniformly upon the paper; also, in a reciprocating and vibrating toothed finger operating in combination with the before-mentioned devices to convey the separate blank, piece, or sheet to the mechanism by which it is to be converted into an envelope or otherwise manipulated or treated for any other purpose.

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

A is the framing, and B a table, upon which is placed a pile of envelope-blanks, *a a*, represented in red color. This table is intended to have a very slow movement in order to keep the top blank of the pile at about the same level as the pile is reduced by the operation

of the machine; but the means of obtaining this movement is not shown, as such a movement of the table is common.

b b are gages secured in the table for keeping the back edges of blanks in proper position to be taken by the feeding devices; and *b'* is a gage attached to the fixed bed *B'*, which is in front of the table *B*, for keeping the front edges of the blanks in proper position. *C* is a horizontal rotating shaft arranged in the rear of and above the table *B*, and carrying two cams, *D* and *E*, and a pair of cranks, *F* and *F'*, the purposes and operations of which will be presently described.

G is a presser, consisting of a straight-edged plate attached securely to the front end of lever *G'*, which is fast on a horizontal rock-shaft, *G''*, arranged over the table *B*. This rock-shaft is furnished with an arm, *c*, to which there is applied a spring, *d*, which keeps the presser *G* down upon the pile of blanks during about half of every revolution of the shaft *C*, the said presser being raised during the other portion of each revolution by the action of the cam *D* upon the rear end of the said lever.

H is the blade for loosening the top blank of the pile, having its edge, of the form shown in Figs. 3 and 4, set with a downward inclination toward the presser *G*, or in the opposite direction to that in which the feed is to take place, the object of such inclination being to loosen the front ends of the top blanks from the pile by gathering them up, as shown at *a'* in Fig. 2, and slipping them backward in the opposite direction to the feed or toward the presser *G*, while the latter is pressed down upon the back part of the pile. I will here remark that this mode of loosening the blanks is the subject of Letters Patent No. 10,824, granted to H. Clark, April 25, 1854, but that Clark used blocks faced with india-rubber instead of the blade *H* for taking hold of the top blank or sheet. The blade *H* has an edge of the peculiar form shown in Fig. 3, presenting a series of sharp points or teeth, *e e*. These points or teeth are produced by cutting with a chisel in the flat surface of the under face of the blade a series of notches, *f f*, as shown in Figs. 4 and 5, similar to what are made in what is termed a "float-cut file," the direction of the said notches being transverse to the edge of the blade, and afterward grinding the

opposite side of the blade on a bevel, as shown at *g* in Fig. 1, till the ridges between the notches *ff* form sharp points or teeth. I have made numerous experiments with edges of various characters and with series of points of various forms and constructions, but have found no edge or system of points which take hold of the upper sheet or piece of paper from a pile with so much certainty as the toothed edge above described. The blade *H* is attached to a lever, *H'*, which is carried by a horizontal rock-shaft, *I*, which is fitted to work in bearings in two arms, *J' J'*, rigidly attached to a horizontal rock-shaft, *J*, whose journals are arranged in fixed bearings supported on the sides of the frame *A*. The rock-shaft *J* has its rocking motion produced by the combined action of the cam *E* on the rotating shaft *C* and a spring, *h*, the said cam acting upon a sliding rod, *E'*, which is connected with an arm, *J²*, secured to the rock-shaft, and the spring connecting the said arm with a stationary guide, *K*, through which the rod *E'* works. The motion of the rock-shaft *J* produces the necessary backward and forward movement of the blade *H*, and its upward and downward movement is obtained by the movement of the rock-shaft *I* in its bearings, produced in the following manner: As the arms *J' J'* and rock-shaft *I* are swinging forward or away from the table *B*, a pin, *i*, carried by an arm, *I²*, secured to *I*, runs up a stationary inclined plane, *j*, shown in Figs. 1 and 6, and so causes *I* to turn in a direction to raise the blade *H*, and as the arms *J' J'* swing back again the said blade is depressed by the action of springs *l l*, which connect the front end of the lever *H* with the rock-shaft *J*. The lever *H'* is not rigidly secured to the rock shaft *I*, but fitted to oscillate thereon to a slight extent in order to enable the springs *l l* to always bring the toothed edge of the blade *H* in contact with the top blank with a suitable and uniform pressure notwithstanding slight variations in the elevation of the top of the pile or any inaccuracy in the mechanism from which the said blade derives its motion, and the said lever is lifted to raise the blade *H* by means of an arm, *H²*, which is firmly secured upon the rock-shaft *I*, and which is furnished with a pin or projecting piece, *m*, which is situated under the said lever. As the rock-shaft *I* is swung back toward the presser *G* by the action of the rock-shaft *J*, the springs *l l* keep the lever *H'* bearing upon the pin *m* until the edge of the blade *H* is allowed by the pin *i*, descending the inclined plane *j*, to come in contact with the top blank and be pressed down thereon by the said springs *l l*, and in the continued backward movement of the rock-shaft *I*, blade *H*, and their appurtenances, the arm *H* is allowed to drop to bring its pin *m* out of contact with the lever *H'* and leave the blade *H* pressed upon the paper with such pressure as is due to the springs *l l*.

L is the separator for separating the top sheet of the pile from the one next below it

when its front end is moved forward again after having been moved back, consisting of a plate attached to a horizontal rock-shaft, *M*, which is arranged parallel with the rock-shafts *I*, *J*, and *G²* in fixed bearings secured to the bed *B'*, just in front of the table *B*. This plate is beveled to a thin edge, which is presented over the front edge of the table *B*, toward the presser *G*, and which projects over the front gage, *b'*. This separator has applied to it a spring, *n*, which tends to press its edge down upon the pile of blanks *a a*. The rock-shaft *M* has secured to it near one end an elbow-lever, *q r*, (shown in Fig. 2,) the upper arm, *q*, of which has a hole, through which plays a rod, *p*, (shown in Figs. 1 and 2,) which is connected with the arm *J²* of the rock shaft *J*, and on this rod there is a screw-thread fitted with a nut, *p'*, which, as the said arm *J²* swings forward with the motion of the rock-shaft *J*, comes in contact with the arm *q*, and by pushing said arm back raises up the separator from the pile to permit the front end of the top blank to be drawn from under it by the blade *H* when the latter moves back again. After the separator has been thus raised, it is locked to prevent its descending, when the arm *J²* swings back again by means of a spring stop lever, *N*, which works on a fixed fulcrum, *s*, Fig. 2, and which is drawn by the spring *s'* under the arm *r* of the elbow-lever so soon as that arm has been raised above its projection *s²*. As the knife is about to terminate its backward movement the end of the rod *p* comes in contact with the said stop-lever *N* and pushes it from under the arm *r* of the elbow-lever, and so permits the spring *n* to bring down the separator on the next blank below the top one, which has been exposed by the blade *H* having drawn back the front end of the top one. The consequence of this descent of the separator is that when the blade *H* moves forward again with the front part of the top blank the latter is caused to pass over the separator.

P is the toothed finger which takes hold of the front end of the blank after it has been deposited upon the separator and draws the whole blank forward over the bed *B'*. This finger is furnished with two very fine and sharp-pointed pins or teeth, *x x*, and is secured rigidly to a horizontal rock-shaft, *P'*, which is fitted to bearings in a carriage, *Q*, which is fitted to slide on ways on the sides of the framing *A A*, and is connected by rods *Q' Q'* with the cranks *F F* on the rotating shaft *C*, and which derives from the said cranks a horizontal reciprocating motion in a backward and forward direction. The said rock-shaft *P'* is furnished with an arm, *P²*, to which a spring, *w*, is applied in such manner as to exert a constant tendency to raise it, and so depress the finger *P*. This arm *P²* is so formed that in passing under a stationary pin, *t*, secured in the frame *A*, just before the carriage completes its forward movement, it is depressed, and the finger *P* thereby caused to

be raised up. When thus depressed, the said arm P^2 is locked by a self-acting spring-stop, R, which swings on a pin, u , attached to the carriage Q, and the finger P is thus kept raised above the bed B' during nearly the whole of its backward movement, but just before the latter movement terminates the spring-stop R strikes a stationary-pin, v , secured in the frame A, and is so caused to liberate the arm P^2 and allow the spring w to bring down the finger and make it stick its points $x x$ into the front part of the top blank, which has had that part deposited upon the separator, the presser G and separator being now raised up and the said blank being free to be carried forward. The top of the separator and surface of the bed B' have grooves provided in them for the reception of the pins $x x$, to prevent the blunting of the said pins and insure their penetrating the paper.

Having now described the construction and separate operations of the various parts of the feeder, I will briefly explain their combined operation in feeding the blanks. The blade H comes down upon the front part of the top blank of the pile, while it is held down some distance farther back by the presser G, and while the separator L is raised, and in moving backward, the said blade gathers up the said blank in front of the presser G, as shown at a' in Fig. 2, and draws its front edge from under the separator, leaving all the other blanks undisturbed. The separator now comes down upon the uncovered front portion of the blank next below the top one, and the blade H moves forward to bring the front edge of the top one upon the separator, after having done which it rises up out of contact with the blank. The separator then rises up from the pile, raising the front portion of the top blank, and being locked by the lever N, as hereinbefore explained, and this movement of the separator is followed by the rise of the presser G to liberate the said blank, which is then imme-

diately taken by the finger P and by it drawn back over the bed B and delivered to the mechanism in which it is to be folded or otherwise manipulated. As soon as one blank has been drawn from under the presser G the latter descends upon the next one below, and as soon as the first one has entirely passed the blade H the said blade comes down again upon the next one, and begins to gather it up toward the presser, as before described with reference to the first one, and in this way the operation is repeated with every revolution of the shaft C.

I do not claim the loosening or detaching of a sheet or piece of paper from a pile by a backward and forward movement; but

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

1. The employment for loosening or detaching a sheet, piece, or blank of paper from a pile of a blade, H, having a toothed edge of the construction herein described with reference to Figs. 3, 4, and 5.

2. The attachment of the loosening and detaching blade H, or any blade for a similar purpose, to a rock-shaft, I, which has a reciprocating motion transverse to its axis, as well as an oscillating motion upon its axis, by means of a lever, H^1 , applied to work loosely upon the said rock-shaft, in combination with a spring or springs, l , and an arm, H^2 , and pin or projection m , rigidly attached to the said rock-shaft, substantially as herein specified.

3. The reciprocating and vibrating toothed or pointed finger P, applied and operating in combination with the oscillating separator L, and the blade H or other device for loosening the paper from the pile by a similar action, substantially as herein specified.

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