

(No Model.)

2 Sheets—Sheet 1.

E. DUMMER.
PAPER FEEDING MACHINE.

No. 576,776.

Patented Feb. 9, 1897.

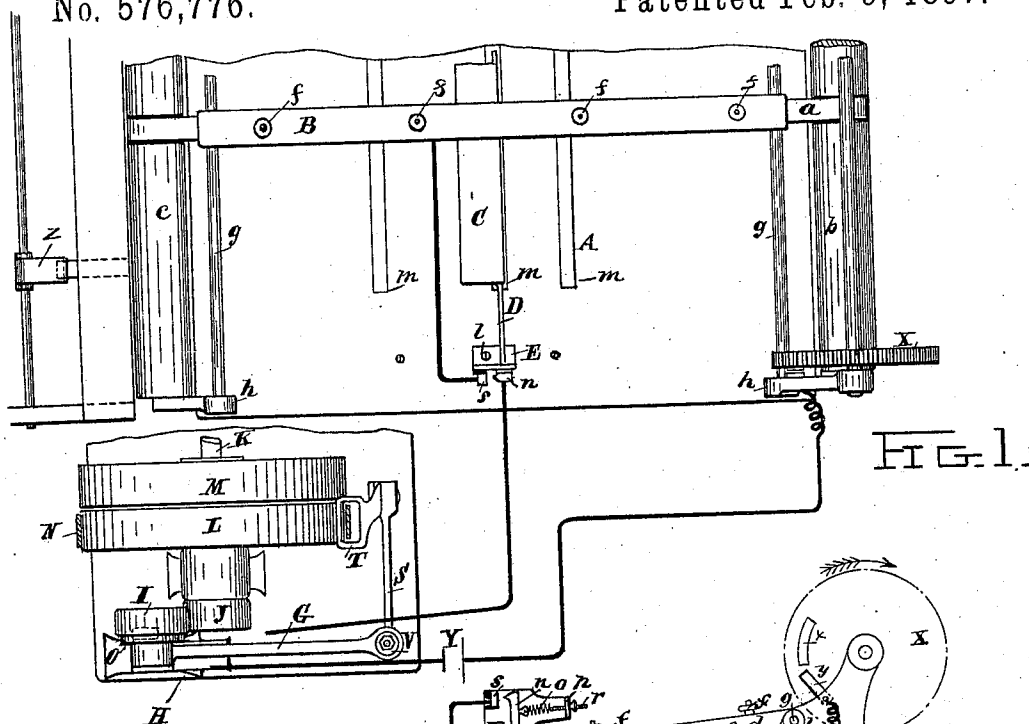


FIG. 1.

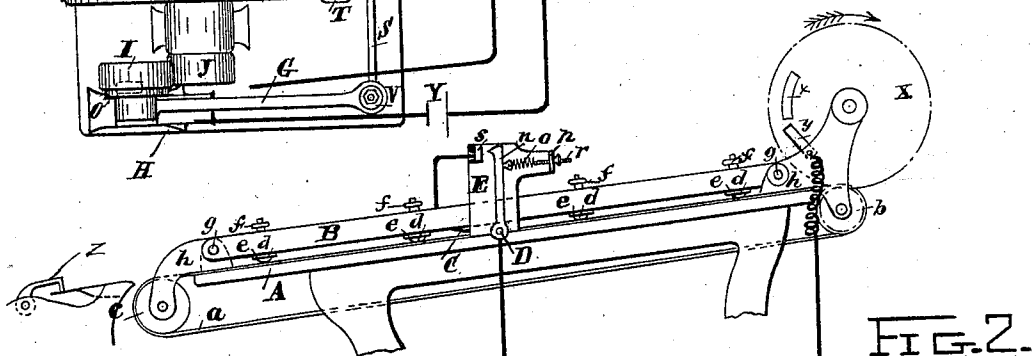


FIG. 2.

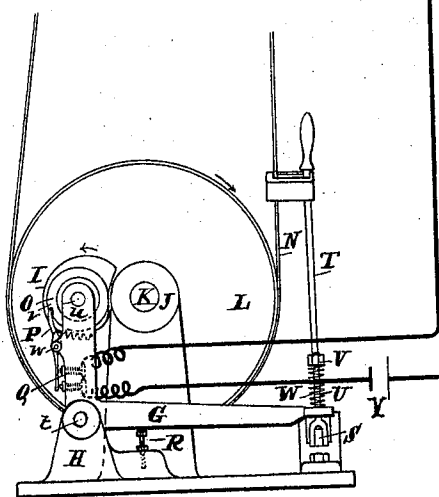


FIG. 3.

WITNESSES -
Edward Wyman
Fred W. McCarty

INVENTOR -
Edward Dummer.

(No Model.)

2 Sheets—Sheet 2.

E. DUMMER.
PAPER FEEDING MACHINE.

No. 576,776.

Patented Feb. 9, 1897.

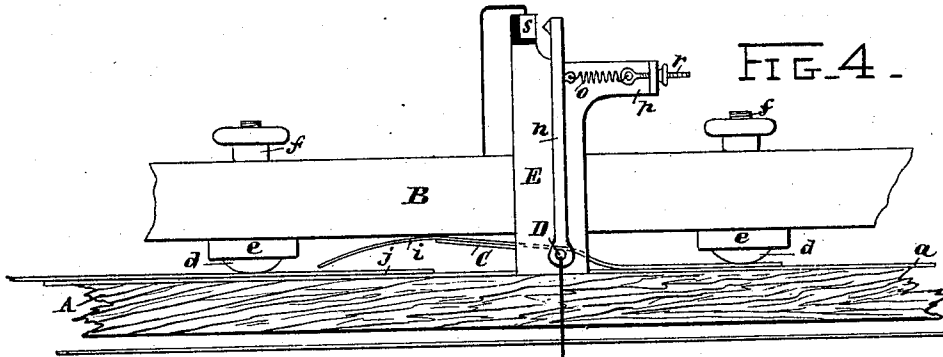


FIG. 5.

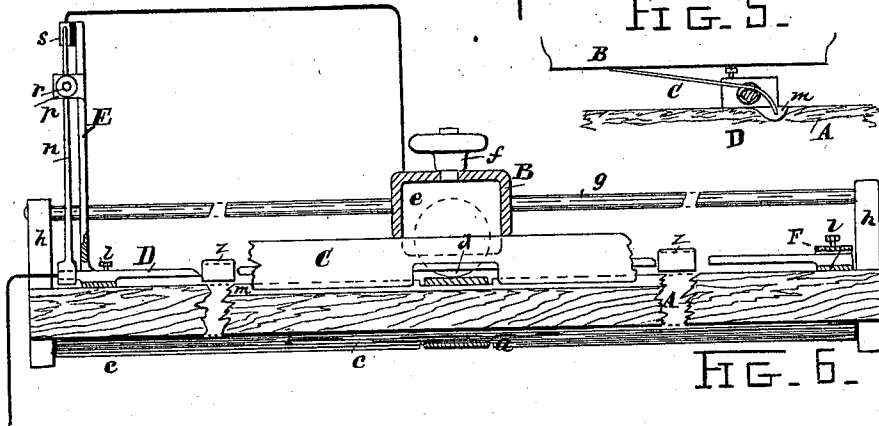
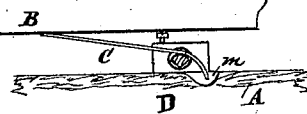


FIG. 6.

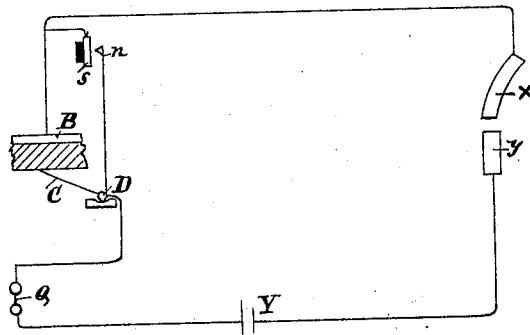


FIG. 7.

WITNESSES:
Edward Tynan
Frederick W. Clark

INVENTOR:
Edward Dummer

UNITED STATES PATENT OFFICE.

EDWARD DUMMER, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO THE
DUMMER PAPER FEEDER COMPANY, OF PORTLAND, MAINE.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 576,776, dated February 9, 1897.

Application filed March 13, 1894. Serial No. 503,527. (No model.)

To all whom it may concern:

Be it known that I, EDWARD DUMMER, a citizen of the United States, residing at Newton, (Auburndale,) county of Middlesex, and State of Massachusetts, have invented certain new and useful Improvements in Paper-Feeding Mechanism, of which the following is a specification, reference being had to the accompanying drawings.

10 The first part of my invention relates to means for allowing one sheet to lap over another sheet between the mechanism for separating the sheets individually from a pile of sheets and the place where they are to be seized or operated upon, as in printing, folding, or other machines.

15 The second part of my invention relates to devices for stopping the feeder, printing, folding, or other machine when the separator or other part of the mechanism fails to seize or carry a sheet as required.

20 The third part of my invention relates to means for detecting and indicating the passage of more than the desired number of sheets and devices for stopping the feeder, printing, folding, or other machine when two or more sheets are seized or carried in the place of one sheet as desired.

25 The invention consists in the devices and the combinations of devices which coact to attain the several objects, as hereinafter set forth, and specifically pointed out in the claims.

30 In the drawings, (two sheets,) Figure 1 is a plan, and Fig. 2 is a side view, of so much of paper-feeder and shipping mechanism as serves to illustrate my invention. Fig. 3 is an end view of the shipping mechanism. Figs. 4, 5, and 6 show details drawn on a larger scale, Fig. 4 being a longitudinal, and Fig. 6 a transverse, section. Fig. 7 is a diagram showing the manner of making the electrical connections.

35 The board A represents the plane or feed-board, on the surface of which sheets are caused to pass by means of a suitable carrier. This carrier I prefer to consist of a belt *a*, which extends around pulleys or rolls *b* and *c* and by them is propelled to run, as to its upper part, in a groove in the upper surface of the board A, and rollers or balls *d* freely

maintained in holders *e* therefor, which are adjustable by means of screws on nuts *f* through the length of a stationary bar B, and press on the belt *a* or sheet thereon. This bar is supported by transverse rods *g*, which are held at their ends by fixed stands *h*.

Owing to a stopping of a sheet for a time, as in a printing-machine at the gages, (shown at *z* in Figs. 1, 2, and 6,) and just before the grippers seize the sheet, and owing to the size of sheets, the usual length of a feed-board, and the desirability of keeping the following one or more sheets in motion, it may be necessary to have the sheet (indicated at *i* in Fig. 4) following the one to remain at rest overlap the latter, (indicated at *j* in Fig. 4.) For this purpose I locate a transverse strip C, which being inclined and having one edge below the surface of the board A is secured in position in any suitable manner, preferably by being fastened to a rod D, which is supported at the outer ends by stands E and F. These stands are adjustable on the board A by means of screws *l*. Grooves *m* are made in the board, so that the strip C may be located according to the size of the sheets. The sheets being carried down the board A in the direction indicated, a ball being located at a sufficient distance above and another at a sufficient distance below the strip C, the lower sheet after having been carried over this strip will drop down as to its upper edge onto the board, and the following sheet will be caused to overlap the former sheet while at rest as much as may be required.

For the purpose of attaining the second and third objects of my invention I pivot the rod D in the stands E and F, preferably on knife-edges, as shown. On one end of the rod D is an arm *n*. The weight of the strip C is counterbalanced, preferably, by means of a spring *o*, secured at one end to the arm *n* and at the other end to a projection *p* on the stand E. The tension of this spring is made adjustable by means of a screw and nut *r*, so that the strip C will just touch the bar B, but not with pressure sufficient to prevent a sheet being carried by the belt and ball or balls between the strip C and bar B. If by any chance two or more sheets are carried over the strip C, their weight being greater than that of one

sheet they will so swing the strip C, and hence rock the rod D, that the arm *n* will meet a stop *s*.

The immediate device for stopping the machine consists of a lever G, pivoted to a stand H at *t*, having pivoted thereon a cam-wheel I at *u*. The stand H may be fastened to the floor or foundation for the machine, and is located so that the face of the cam-wheel I may come in contact with the face of a pulley J on a shaft K of the machine, preferably the driving-shaft, on which are the usual fast pulley L and a loose pulley M for a belt N. There is a flange O on the cam-wheel I to provide a projection *v*, with which may engage a pawl P, pivoted at *w*. Removal of the pawl P from engagement with the projection *v* is caused by an electromagnet Q. Under the longer arm of the lever G is a stop R, which is adjustable. The outer end of this arm is connected with an arm S, secured to the ordinary shipping-lever T by a flexible connection or rod U. This rod may slide in an opening therefor in the end of the lever G, and has thereon an adjustable boss or nut V, between which and the lever there is a spring W, acting as a buffer to prevent undue strain. The stand H is so placed that when the pawl P is in engagement with the projection *v* the cam-wheel I will not be in actual engagement with the pulley J. On releasing the pawl the cam-wheel will swing a slight distance, owing to its greater weight on one side, (in the direction indicated by the arrow,) so as to come in contact with the pulley J. This pulley, being in revolution, (in the direction of the arrow shown,) will complete a revolution of the cam-wheel, which, owing to its eccentricity, will cause the lever G, and hence the lever T, to swing and ship the belt N from the fast to the loose pulley. On completion of a revolution by the cam-wheel it will be stopped by the pawl P and held thereby for another action, and the longer arm of the lever G will drop onto the stop R and allow free movement of the lever T for shipping the belt by hand to again start the machine.

On some moving part of the machine, as, for instance, the gear X, is a metallic piece *x*, which will be carried into contact with a metallic piece *y*, while a sheet should be between the strip C and bar B, the pieces *x* and *y* forming an electric-circuit closer.

The electric connections are as follows: From one pole of a generator of electricity *y* a line extends to one end of the coil of the magnet Q and from the other end of said coil to the strip C. The bar B and stop *s* are electrically connected with the piece *x* and the piece *y* with the other pole of the generator, said strip, bar, stop, and piece, being suitably insulated, as indicated.

In operation the strip C will serve to raise up a sheet, when caused to pass thereover by the carrier, so that it will lap over the previous sheet, which is at rest. If there is no sheet between the strip C and bar B at the

required time, (being while the pieces *x* and *y* are in contact,) the electric circuit will be closed by means of the bar B and strip C, (these parts forming the two members of a circuit-closer,) and the pawl P will be disengaged from the projection *v*. Thereupon the cam-wheel I will swing into contact with the pulley J and be caused to revolve, so that by means of the levers G and T the belt will be shipped and the machine stopped. If there are two or more sheets on the strip C at the time when there should be but one, (being while the pieces *x* and *y* are in contact,) the weight of these sheets being sufficiently greater than the weight of one sheet, the arm *n* will be brought into contact with the stop *s* (these parts constituting the members of a circuit-closer) and the electric circuit will be closed, so that the stopping device will act as explained above.

In adapting my invention to a paper-feeder (as shown or differently constructed in other respects from that described) in which the objects desired to be accomplished may be all or only a certain part of those attained by the invention it will appear as follows: If it is only required that each sheet should overlap in its progress the previously-carried sheet, then the strip C may be fixed in the position set forth by any means that would be regarded as suitable by a skilled mechanic. By having the strip C extend through the whole or considerable part of the width of the sheet not only will the sheet move evenly thereover, but (the strip being pivoted) a sufficient part of the sheets will be brought to bear thereon by gravity so as to swing the same when of greater than the predetermined weight.

It is well known that two or more sheets may stick together and have their edges in line so closely that the eye will not perceive that there are two or more sheets passing in the place of one. Since the weight of several sheets will cause the pivoted strip C to move, and the size and motion of the strip are considerable, this movement might be seen in season to stop the machine by hand. Furthermore, the arm being of any required length would be a simple device to make the movement of the strip or supplementary support more apparent. Moreover, other and well-known stopping devices might be released or set into action by the moving strip C by simple means within the knowledge of an ordinary mechanic, the difficult operation, which consists in setting in motion a device when two or more sheets are passing in the place of one, having been accomplished. There being so many known devices by which the making and breaking of an electric circuit will set into action a visual or an audible signal or a releasing device for stopping mechanism that part of my invention which provides for affecting an electric circuit, as required, on the passage of more than the desired number of sheets forms a complete de-

vice applicable by ordinary mechanical skill to the known devices referred to.

I claim as my invention—

1. In a paper-feeder the combination of a feed-board, a carrier to move sheets individually on said board, a stop or gages to be met by the front edge of each sheet, and a strip over which the sheets pass extending transversely across said board, said strip being pivoted whereby it may swing freely, substantially as set forth.

2. The combination with a carrier for sheets of paper embodying a belt, rollers opposite said belt and means for propelling said belt, of a stop or gages to be met by each sheet and an inclined strip located transversely with reference to said belt so that each sheet will be caused to pass over said strip and be raised thereby so as to lap over the sheet previously carried and at rest, substantially as specified.

3. In a paper-feeder the combination of a feed-board, a belt caused to pass lengthwise of said board, rollers maintained above said belt, a stop or gages to be met by each sheet, and a transverse strip above said board and inclined with reference thereto, substantially as specified.

4. In a paper-feeder the combination of a feed-board, a carrier to propel a sheet on said board, an electric circuit and magnet therein, two members of a closer for said circuit so located on said board in the path of the sheet that the sheet will be carried between said members, two members of another closer in the same circuit brought into contact intermittently, stopping mechanism, and a releasing device for said mechanism operated by said magnet, substantially as set forth.

5. In a paper-feeder the combination of a feed-board, a belt propelled lengthwise of said board, rollers opposite said belt, a bar to retain said rollers in position, a transverse, pivoted strip inclined with reference to said board, an electric circuit, a magnet in said circuit, stopping mechanism, a releasing device for said mechanism and operated by said magnet, said bar and strip so connected with said circuit as to form a closer therefor, substantially as specified.

6. In a paper-feeder the combination of a carrier for a sheet of paper, an electric circuit, an inclined strip located in the path of said sheet and transversely with reference thereto, a bar or contact-piece between which and said strip said sheet should pass and with which said strip will be in contact when there is no sheet therebetween, said bar or contact-piece and strip forming the two members of a closer in said circuit, another closer in said circuit the members of which are brought into contact intermittently, a magnet in said circuit, stopping mechanism for the feeder, and a releasing device for said stopping mechanism operated by said magnet, substantially as specified.

7. In a paper-feeder the combination with stopping mechanism and a releasing device

therefor, of a main support and a transverse strip or supplementary support for a sheet of paper and over which the sheet is caused to pass, and suitable connections between said strip or supplementary support and said releasing device, said strip or supplementary support being adjustably counterbalanced so that it will sustain a predetermined weight, substantially as and for the purpose set forth.

8. The combination of a pulley on a driving-shaft of a machine, a lever pivoted on a stationary stand, a cam-wheel pivoted on said lever to ride on said pulley, and stopping mechanism for the machine connected with said lever, substantially as set forth.

9. The combination of a pulley on a driving-shaft, a lever pivoted on a stationary stand, a cam-wheel pivoted on said lever to ride on said pulley, and a belt-shipping lever connected with the lever carrying said cam-wheel, substantially as specified.

10. The combination of a pulley on a driving-shaft of a machine, a lever, a stand to which the lever is pivoted, a cam-wheel pivoted on said lever to ride on said pulley, an electromagnet, a pawl operated by means of said magnet and to engage with said wheel, and shipping mechanism of said machine connected with said lever to be moved thereby, substantially as specified.

11. In a paper-feeder the combination with an electric circuit and a closer therefor operated by means of a sheet of paper, and mechanism for carrying the sheet, of a pulley on a driving-shaft, a cam-wheel in position to be acted on by said pulley, a lever on which said cam-wheel is pivoted, an electromagnet in said circuit, a pawl to engage with said cam-wheel and in position to be operated by said magnet, and shipping mechanism adjustably connected with said lever to be operated thereby, substantially as set forth.

12. The combination of a driving-shaft, a pulley on said shaft, a pivoted lever, a cam-wheel on said lever to engage with said pulley, shipping mechanism of a machine, and an adjustable connection between said lever and said shipping mechanism, substantially as set forth.

13. In a paper-feeder and in combination with the carrier thereof for the separated sheets a device for detecting the passage of more than one sheet at a time through a certain part of the path of the sheets, which device consists in a transverse strip or support for the paper located in said path, said strip or support being movable substantially vertically and counterbalanced so that a certain weight on said strip or support will not move the same but a greater weight on said strip or support will move the same, substantially as specified.

14. In a paper-feeder and in combination with the carrier thereof for the separated sheets a device for detecting the passage of more than one sheet at a time through a certain part of the path of the sheets, which de-

vice consists in a strip or support for the paper located in said path, pivoted to move vertically and counterbalanced, the counterbalance being adjustable, so that any predetermined weight on said strip or support will not swing the same, but a greater weight on said strip or support will swing the same, substantially as specified.

15. In a paper-feeder and in combination with the carrier thereof for the separated sheets an electric circuit, a closer for the same having a member connected with it to be operated by a vertically-movable strip or support for the paper located in the path of the paper and counterbalanced so as to remain stationary when a certain weight is thereon, but be moved by a greater weight thereon, substantially as set forth.

16. In a paper-feeder and in combination with the carrier thereof for the separated sheets, an electric circuit and a closer for the same having a member connected with a pivoted and adjustably-counterbalanced strip or support for the paper located in the path of

the paper, whereby said strip or support will remain stationary when there is any predetermined weight thereon, but will swing substantially vertically and thus operate said closer when there is a greater weight thereon, substantially as set forth.

17. In a sheet-feeding apparatus for a printing or other machine, an electric circuit, a circuit-closing device at one point in the circuit lying in the path of the sheet to be fed and designed to be held open by the passage of the sheet, a circuit-closing device at another point in the circuit designed to be intermittently opened and closed, the arrangement being such that if the sheet is properly fed one of the circuit-closers will be open when the other is closed, and means operated by said circuit for controlling the operation of the machine, substantially as set forth.

EDWARD DUMMER.

Witnesses:

EDWARD WYMAN,
FRED W. MCARDLE.