(No Model.) 2 Sheets—Sheet 1.

G. F. LEIGER.

AUTOMATIC STOPPING DEVICE FOR PAPER FEEDING MACHINES.

No. 588,452. Patented Aug. 17, 1897.

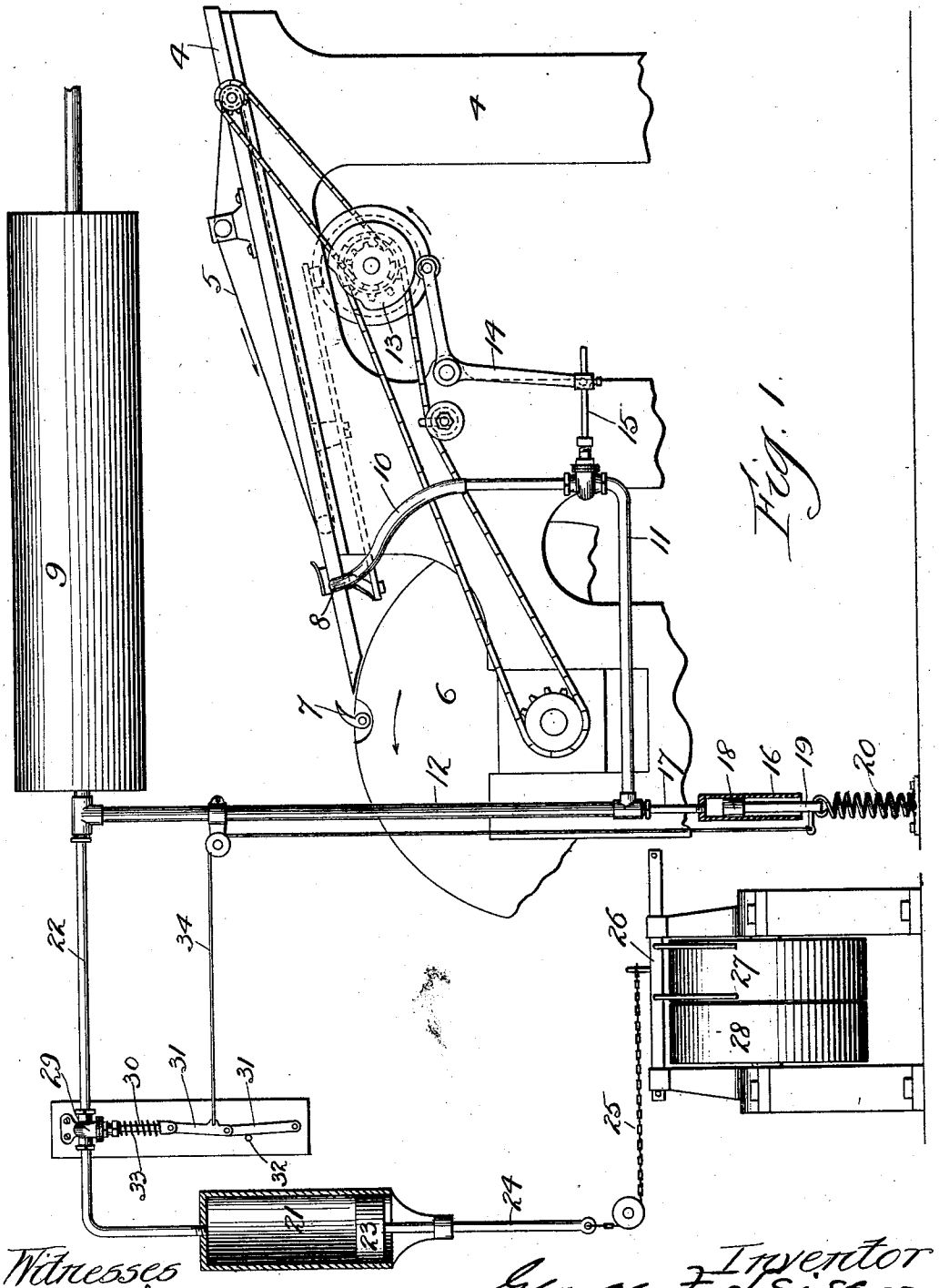


Fig. 1.

Witnesses
Wm. F. Fleming
Wm. N. Rheem.

Inventor
George F. Leiger
by Bond, Adams, Pickard & Jackson
his Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

G. F. LEIGER.

AUTOMATIC STOPPING DEVICE FOR PAPER FEEDING MACHINES.

No. 588,452. Patented Aug. 17, 1897.

Fig. 2.

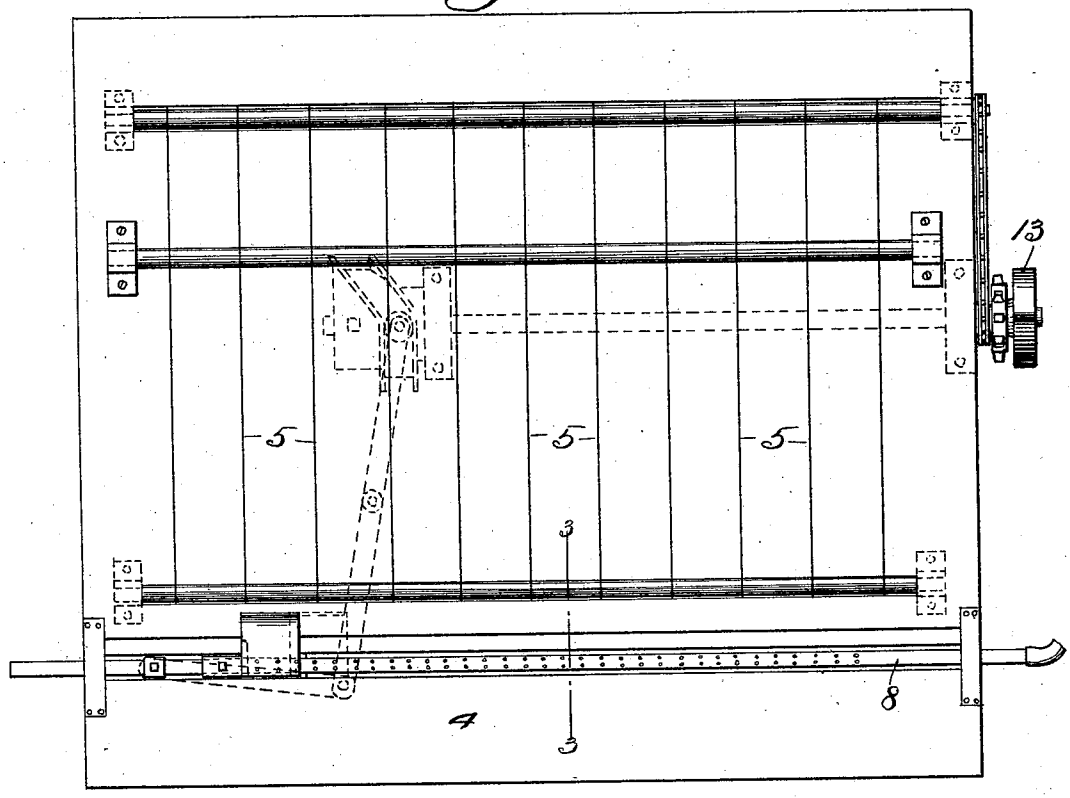
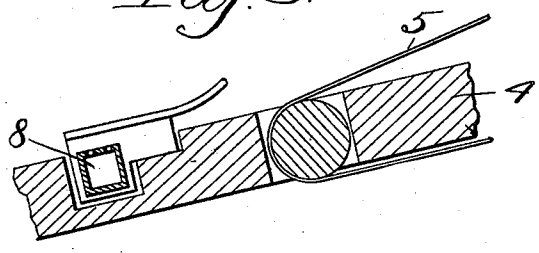


Fig. 3.



Witnesses
Wm. F. Fleming
Wm. N. Rheem.

Inventor
George F. Leiger.
by Bond, Adams, Pollard & Jackson
his Attys.

THE NORRIS-PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE F. LEIGER, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF AND LEWIS BENEDICT, OF SAME PLACE.

AUTOMATIC STOPPING DEVICE FOR PAPER-FEEDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 588,452, dated August 17, 1897.

Application filed September 26, 1896. Serial No. 607,085. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. LEIGER, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Stopping Devices for Paper-Feeding Machines, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of so much of a paper-feeding machine as is necessary to a clear understanding of my improvements, said improvements being shown attached thereto and the view as a whole being partially diagrammatic. Fig. 2 is a plan view of the feeder; and Fig. 3 is a detail, being a section at line 3 3 of Fig. 2.

This invention relates to improvements in machines for feeding sheets of paper to a printing-press, folder, or elsewhere, as desired; and its object is to provide means for automatically stopping the operation of the sheet-feeding devices whenever a sheet is carried forward in an improper position or when a partial sheet only is carried forward. I accomplish this object by the mechanism shown in the accompanying drawings and hereinafter fully described. That which I believe to be new will be set forth in the claims.

In the drawings, 4 indicates the framework of a machine for feeding forward sheets of paper, and 5 indicates tapes which carry the paper, said tapes being shown as running around rollers journaled in the frame as usual.

6 is an ordinary printing-cylinder provided with ordinary grippers 7.

8 indicates a tube mounted at the lower end of the frame 4 in such manner as to be capable of a slight longitudinal movement for the purpose set forth in my application, Serial No. 583,127. The means employed for imparting this movement are the same as described in said application, and therefore such description need not be repeated here.

The tube 8 is provided with a number of holes on its upper face, as shown in Fig. 2, and is placed in communication with a vacuum-chamber 9 by means of a flexible pipe 10 and pipes 11 and 12, the vacuum in said chamber being maintained by a pump (not shown) located in any desired position. The communication between this perforated tube 8 and vacuum-chamber 9 is alternately cut off and established through the medium of a valve in the pipe 11, which valve is operated by the action of a cam 13 on a bell-crank lever 14, that is connected to the valve-stem 15.

Although a large number of holes are shown in the face of the pipe 8, it is found in practice that the best results are attained by leaving open only a small number of such holes at the end toward the side of the machine to which the paper is to be drawn for alinement, the remaining holes being closed by pasting paper over them, or they might be closed in any other suitable manner that will allow of their being readily opened again for use with different-sized sheets. By having only the holes at the end open the sheet is caught only at or near one corner, and in being pulled toward the side for alinement any wrinkles or creases that may be in the paper are straightened out in much better manner than if the whole forward edge of the paper was held sucked to the pipe.

As described in my said former application, the operations of the parts are timed so that communication between the pipe 8 and chamber 9 is established just as the forward edge of a sheet is passed from the tapes 5 over the pipe 8, with the result that on account of the exhaustion of the air from the said pipe the sheet of paper will be firmly held, and by the shifting of the pipe longitudinally be properly alined for delivery to the press or other place of deposit, and when so alined the communication is cut off, allowing the sheet to be released for delivery, such delivery, as shown in the drawings, being to the cylinder 6, and another sheet being delivered onto the pipe as the preceding one leaves it, the communication between the pipe and the vacuum-chamber being cut off as the sheet, after being properly alined, is passing to the cylinder 6, and being established again in time to allow the following sheet to be sucked onto and held by the pipe for purposes of alinement.

16 indicates a cylinder connected by a length of pipe 17 of comparatively small diameter with the pipe 12. Within this cylin-

der is a piston 18, the rod 19 of which projects through the lower open end thereof and is connected to a suitable spring 20, one end of said spring being securely fastened in place, as shown.

21 indicates another and larger cylinder which communicates with the vacuum-chamber 9 through a connecting-pipe 22. Within this last-named cylinder is a piston 23, the rod 24 of which is connected to an ordinary belt-shifting device. As shown, the connection between the piston-rod and the belt-shifter is by a chain 25, which is guided around a suitable pulley.

26 indicates a belt-shifter, and 27 28 the driving and loose pulleys respectively.

At the point 29 in the pipe 22 is located a valve by which communication between the chamber 9 and cylinder 21 is controlled. 30 is the stem of this valve 29 and is pivoted to one end of one of a pair of toggle-levers 31, which are normally kept in the position shown.

32 is a stud or pin which acts as a limit-stop for the toggle-levers.

33 is a spring surrounding the valve-stem 30.

34 is a connection between the pair of toggle-levers 31 and the piston-rod 19, which connection, as shown, is a cord, but which may be any other suitable connecting means.

The operation is as follows: When a sheet of paper that is torn in such a manner as to leave some of the operative openings in the pipe 8 uncovered, when such sheet is fed onto the pipe, or when a sheet is improperly fed forward and will therefore not be deposited on said pipe in such manner as to come over the holes, air will rush in through such holes, and as the valve in the pipe 11 is opened the air will pass downward through such pipe 11 and through the pipe 17 into the upper end of the small cylinder 16, destroying the vacuum in the upper end thereof sufficiently to cause the spring 20 to pull down on the piston-rod 19, the piston 18 being theretofore held up by the pressure of the atmosphere against its under face. The downward action of the spring 20 pulls on the connection 34, which causes the toggle-levers 31 to be pulled forward, and when pulled so that their inner ends pass the pivots at their outer ends the spring 33 is brought into action, forcing the toggle-levers still farther outward and drawing down the stem 30 and thereby opening the valve in the pipe 22. The opening of this last-named valve establishes a communication between the vacuum-chamber 9 and the cylinder 21 and thereby creates a vacuum or partial vacuum in that portion of the cylinder 21 in front of the piston 23. The pressure of the atmosphere on the outer face of the piston 23 will cause it to move forward within the cylinder, and through the connection 25 will shift the driving-belt to the idler-pulley, thus stopping the machine. It will be understood that the air admitted to the small cylinder 18 in the manner described need be but a very small amount to accomplish the end desired, and but a comparatively small amount will be so admitted, as the valve in the pipe 11 will be quickly closed by reason of the cam 13 being carried around far enough to act on the bell-crank lever, so as to close it before the machine comes to a standstill.

It is to be understood that the various parts by which the stopping of the machine is effected can be arranged in many ways with relation to the machine that they are intended to coöperate with, depending upon the character of such machine, its location, &c.

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

1. The combination with a paper-feeding machine employing an apertured pneumatic paper-holding pipe, of a cylinder connected with said pipe, a piston within said cylinder, means for creating a vacuum within said cylinder, a second cylinder and a piston therein, belt-shifting devices connected with said last-named piston, and means for moving said last-named piston when the vacuum in said first-named cylinder is destroyed, substantially as specified.

2. The combination with a paper-feeding machine employing an apertured pneumatic paper-holding pipe, of a cylinder connected with said pipe, a piston within said cylinder, means for creating a vacuum within said cylinder, a second cylinder and piston therein, a pipe connected with said means for creating a vacuum, a valve arranged in said pipe and operated by the motion of the first-mentioned piston, and a belt-shifting device connected with said second-named piston, substantially as and for the purpose specified.

3. The combination with a paper-feeding machine employing an apertured pneumatic paper-holding pipe, of a cylinder connected with said pipe, a piston within said cylinder, means for creating a vacuum within said cylinder, a second cylinder and piston therein, a pipe connected with said means for creating a vacuum, a valve in said pipe, a pair of toggle-levers connected with said valve, means for operating said toggle-levers by the movement of the piston in the first-named cylinder, and a belt-shifting device connected with said second-named piston, substantially as and for the purpose specified.

GEORGE F. LEIGER.

Witnesses:
ALBERT H. ADAMS,
JULIA M. BRISTOL.