

No. 789,745.

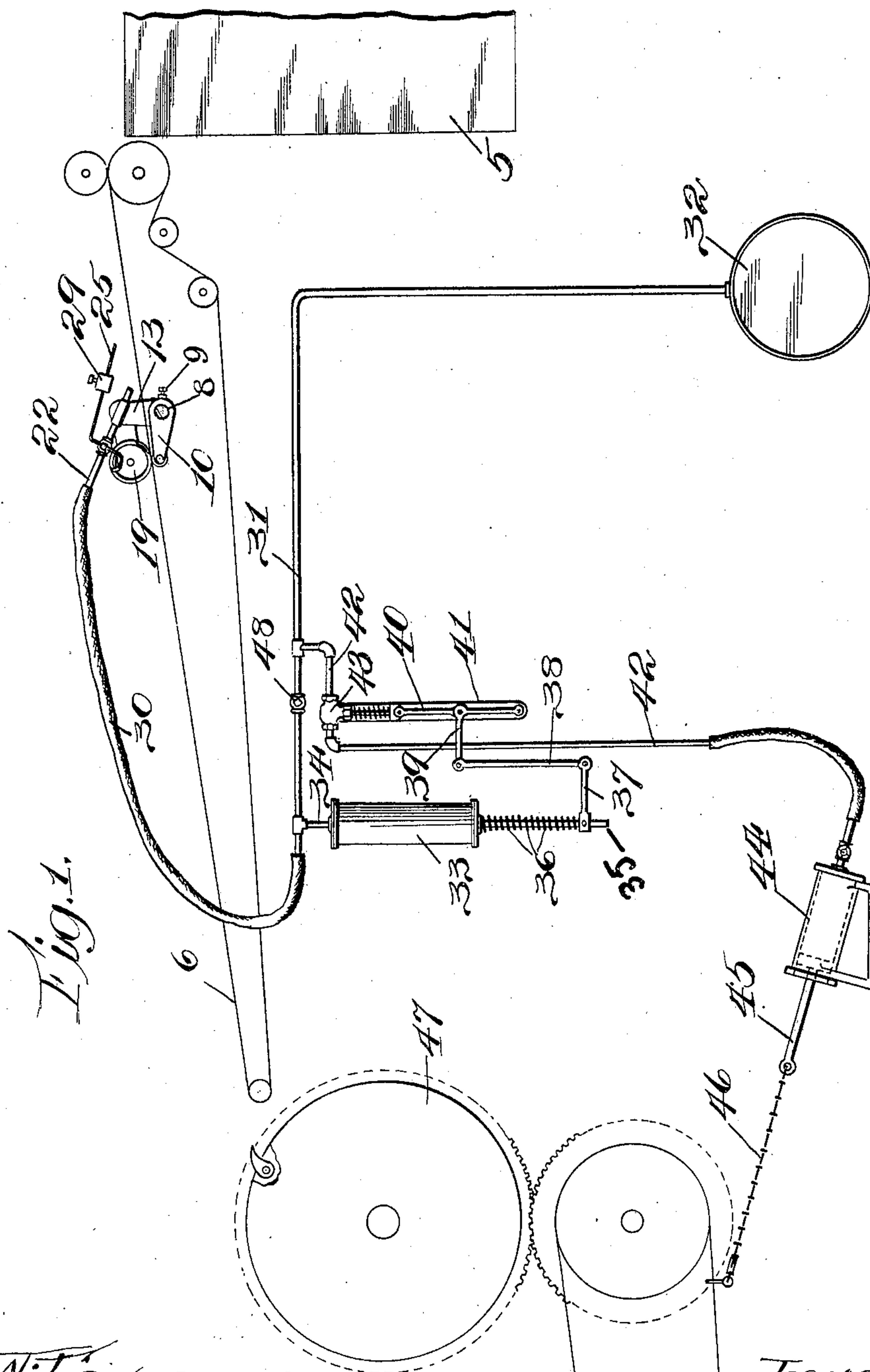
PATENTED MAY 16, 1905.

G. F. LEIGER.

AUTOMATIC STOPPING DEVICE FOR SHEET FEEDING MACHINES.

APPLICATION FILED OCT. 28, 1904.

2 SHEETS—SHEET 1.



Witnesses:
H. Comarus.
J. B. Veir

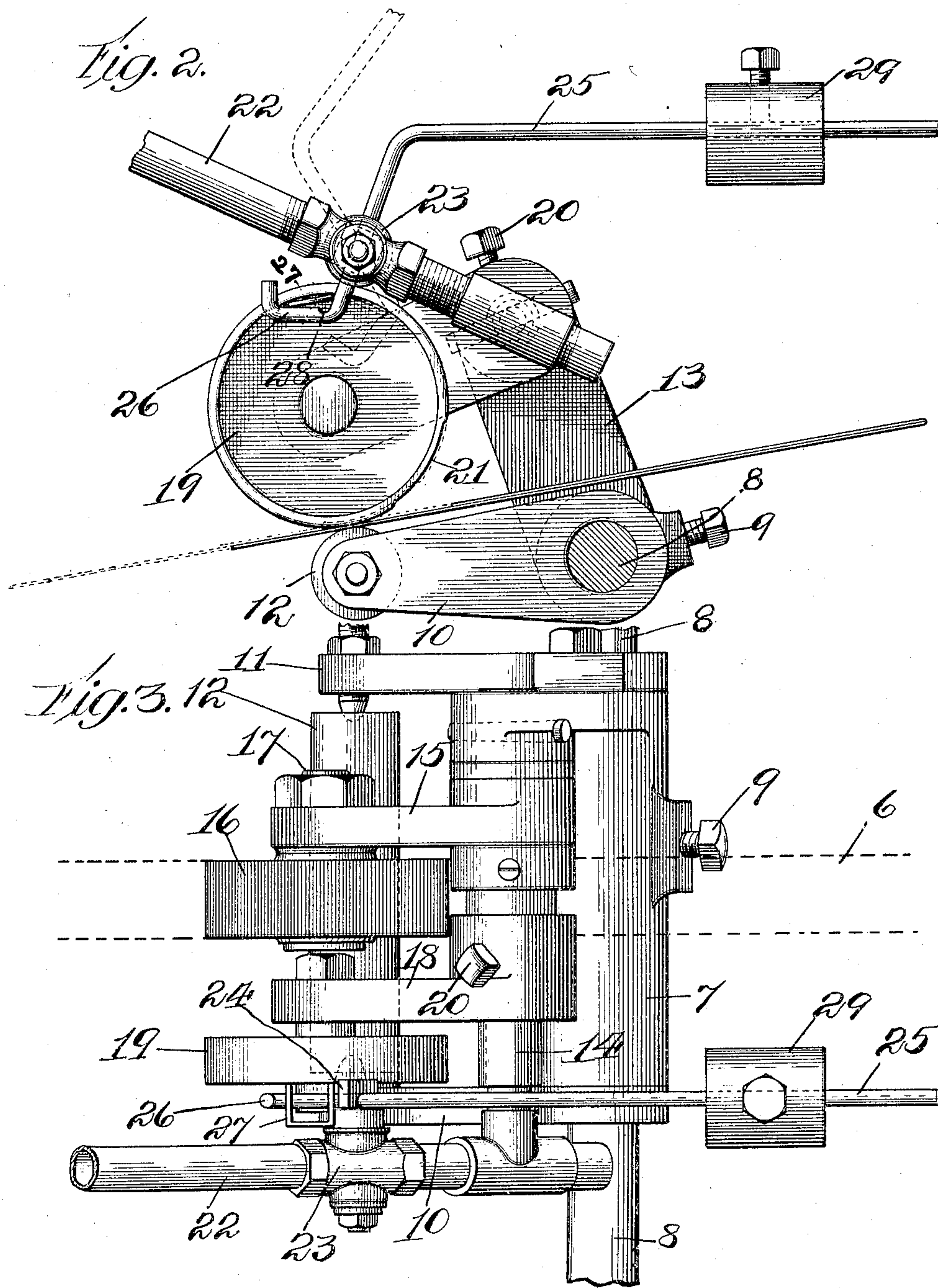
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

GEORGE F. LEIGER, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE L. BENEDICT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC STOPPING DEVICE FOR SHEET-FEEDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 789,745, dated May 16, 1905.

Application filed October 28, 1904. Serial No. 230,365.

To all whom it may concern:

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

This invention relates to improvements in machines for feeding single sheets of paper in quick succession to printing-presses or other machines, and particularly to the type of pneumatic sheet-feeding machines shown and described in Letters Patent No. 557,279, dated March 31, 1896, No. 588,451, dated August 17, 1897, and No. 624,228, dated May 2, 1899, granted upon my applications, and also in my pending application, Serial No. 194,620, filed February 20, 1904.

The invention relates particularly to improved means for quickly stopping the operation of the machine, and has for its object to provide means whereby the machine will be stopped in case more than a single sheet is for any cause attempted to be passed down over the delivery-frame, such stoppage of the machine being caused through the movement of pneumatically-operated mechanism primarily set in motion by an undue thickness of paper, such as two or more sheets or a doubled single sheet moving toward the delivery end of the machine. I accomplish this object by the devices and combination of devices illustrated in the drawings and hereinafter specifically described.

That which I believe to be new will be set forth in the claims.

In the drawings, Figure 1 is a diagrammatic view showing in side elevation my improved stopping mechanism. Fig. 2 is a side elevation of the primary operating mechanism, and Fig. 3 is a plan view of the devices shown in Fig. 2.

Referring to the several figures of the drawings, in which corresponding parts are indicated by like reference characters, 5 indicates one of the standards of the main frame

of the machine, upon which the pile of sheets is supported and upon which is also supported the mechanism for successively lifting the sheets from the pile and feeding them to the moving tapes that are carried by the delivery-frame. The delivery-frame of the machine is not shown, but may be of any suitable construction, such as set forth in my said patents and my pending application. One of the series of tapes referred to is shown and is indicated by 6. This tape 6 approximately indicates the location and arrangement of the delivery-frame referred to.

7 indicates a sleeve adapted to fit over a fixed shaft 8, extending across the delivery-frame referred to, to which shaft the sleeve can be secured in the required position by a suitable set-screw 9. Projecting forward from opposite ends of this sleeve 7 are arms 10 and 11, between which near their forward ends is suitably journaled, so as to freely revolve, a roller 12.

13 indicates a third arm, extending upward from the sleeve 7. I preferably cast the sleeve 7, the arm 10, and the arm 13 in one piece and bolt the arm 11 to the outer face of the arm 13; but such parts of course might be separately formed and secured together.

14 indicates a short shaft securely fixed in the upper end of the arm 13 and projecting toward the arm 10 and lying parallel with the shaft 8, upon which the sleeve 7 is mounted.

15 indicates an arm loosely mounted on the short shaft 14 and held in place on such shaft in the construction shown by suitable washers.

16 indicates a pressure-wheel journaled on a pin 17, passing through the arm 15, such wheel lying over the roller 12. One of the tapes 6 passes between this roller 12 and wheel 16, as indicated. 18 indicates another arm on the short shaft 14 and carries at its forward end a comparatively light wheel 19, mounted on a suitable pivot-pin passed through the arm 18. The arm 18, as shown, is fixed to the short shaft 14 by a set-screw 20. It is thus enabled to be adjusted so that the light wheel 19 will be at the exact distance away from the roller 12 to permit a single thick-

ness of paper, and only a single thickness, to pass freely between such wheel and roller without disturbing the operation of the machine. A small portion of the periphery of the wheel 19 is cut away, as indicated at 21, (see Fig. 2,) so that when such cut-away portion is brought opposite the roller 12 two thicknesses of paper can be easily pulled forward and out from between the wheel 19 and the roller 12, all as more fully hereinafter described.

22 indicates a short section of pipe suitably secured upon the projecting end of the short shaft 14 and provided with a suitable and easily-operated valve inclosed within the casing 23, the stem of such valve being indicated by 24.

25 indicates a rod passing through the valve-stem 24 and secured there by a set-screw or in any other suitable manner. As shown best in Fig. 2, the forward end of this rod 25 is bent downward and then turned to form a hook-shaped end 26, adapted to embrace a projection 27, extending out from the adjacent face of the wheel 19. This projection 27 is in the construction shown in the shape of a staple, and such shape I find of advantage in that the two sides of this staple-like projection form efficient stops to hold the wheel 19 in one of its two positions. It is evident, however, that instead of preserving the staple-like form two pins corresponding to the sides of the staple would answer the requirements. In Fig. 2 the parts are shown in their normal position, with the wheel 19 just far enough above the roller 12 to permit a single sheet of paper to pass freely through. If, however, a greater thickness of paper than that of a single sheet is attempted to be passed through the machine, the effect will be to turn such wheel on its axis sufficiently to bring the cut-away portion 21 opposite said roller 12, whereby a sufficient space between this wheel and the roller will be provided to permit of the easy pulling out by the attendant of the papers between them. As the wheel is turned so as to bring its cut-away portion 21 opposite the roller 12 the rear side of the staple-like projection 27 will move down on the inclined portion of the rod 25 until the bend at the lower end of that portion of the rod 25 is reached, when it will enter the small notch 28. The contact of the rear side of this projection 27 with the rod 25 at the notch 28 will prevent the wheel from being further turned, and thereby hold it with its cut-away portion opposite the roller 12, as stated.

29 indicates an adjustable weight on the rod 25, which will act to depress the rear end of the rod when the extra thickness of paper has been removed from between the cut-away portion 21 of the wheel 19 and the roller 12, thus causing, through the action of the rod on the projection 27, a return of the wheel 19 to its normal position.

The turning of the wheel 19 by reason of an undue thickness of paper being fed forward and the consequent turning of the rod 25, as just explained, causes the valve in the casing 23 to be opened and through the operation of the devices about to be described causes an immediate stoppage of the machine.

30 indicates a flexible tube connected at one end to the piece of pipe 22 and connected at its other end in the construction shown to another pipe, 31, that has communication with a suitable vacuum-chamber 32.

33 indicates a small cylinder connected by a pipe 34 to the pipe 31, in which cylinder is a suitable piston, the stem of which is indicated by 35, around which stem is a coiled spring 36, which exerts a downward pull on the piston.

37 38 indicate links suitably pivoted together, the link 37 being also attached to the stem 35 and furnishing a bearing for the lower end of the spring 36, and the link 38 being connected at its upper end to one end of a bell-crank lever 39, said bell-crank lever also being pivotally connected to another link, 40, in such manner as to have such link 40 and one member of the bell-crank lever 39 constitute a pair of toggles. The bell-crank lever and the link 40 are suitably pivoted to a support 41, that is attached to a pipe 42, having communication with the pipe 31, said pipe 42 being provided with a valve-casing 43, in which is located a suitable valve, the stem of which is pivotally attached to the upper end of the link 40, with the result that when the pair of toggles are moved to be out of line the valve in the casing 43 is opened.

44 indicates a small cylinder having communication at one end with the pipe 42. This cylinder 44 has within it a suitable piston, the stem of which, 45, is shown, to which stem 45 is adapted to be connected by a chain 46 or otherwise any of the usual and well-known forms of belt-shifters or other means for switching off the power from the machine. As such power-shifting devices are well known and of many forms and form no part of my present invention, I have not here shown any such device. In my Patent No. 588,452, dated August 17, 1897, is shown such a power-shifting device, and such a construction as there shown may be employed, if desired.

47 indicates a cylinder adapted to receive the sheets as they are delivered by the series of tapes from the machine.

With the machine in operation the parts will be as shown in Fig. 2 and will remain in such position as long as single sheets of uniform thickness are fed forward; but in the event of an increased thickness of paper, such as two or more sheets being fed forward, such increased thickness will cause the wheel 19 to turn, and such turning will, through the projection 27, turn the rod 25, and thereby open

the valve in the casing 23. As the free end of the pipe 22 is open, this opening of the valve destroys the vacuum that had theretofore been maintained in the pipe 22, tube 30, and upper end of the cylinder 33, thus permitting the force of the spring 36 to draw down the piston within the cylinder 33, which of course causes the links 37 and 38 to move and throw the toggles out of line, whereupon the valve in the casing 43 will be opened, putting the pipe 42 into communication with the pipe 31, and by reason of such pipe 31 having communication with the vacuum-chamber a partial vacuum will be created in the cylinder 44 in front of the piston therein, whereby the pressure of the atmosphere on the outer face of such piston will force such piston inward, and thereby cause a shifting of the driving devices. It will be noted that between the points of connection of the pipe 34 and pipe 42 with the pipe 31 is a reducing-valve 48, and by this valve the air coming through the pipe 22 and tube 30 is checked sufficiently to allow of the creation of a sufficient vacuum in the pipe 42 and cylinder 44 to permit of the operation of the power-shifting devices, as herein described.

If desired, two sleeves, such as 7, with their attached parts, as shown in Figs. 2 and 3, may be employed, one for each side of the machine, and spaced a proper distance apart, so that each side portion of each sheet passing through the machine will be pressed upon by a pressure-wheel 16 and will pass under a wheel 19.

By my invention I provide mechanism that can be cheaply applied to existing forms of pneumatic sheet-feeding machines and that can be readily adjusted to permit of different thicknesses of paper passing freely a single sheet at a time, but which will act to promptly stop the operation of the machine in case more than a single thickness of paper is for any cause attempted to be passed through the machine.

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

1. The combination with a sheet-feeding machine, of a wheel and another member, said wheel having a portion of its rim hollowed or cut away and being adapted to permit the passage of a sheet between it and said other member and to be rotated by the passage of material of increased thickness until the hollowed or cut-away portion of the rim is opposite said other member, and means actuated by the rotation of said wheel for operating power-shifting devices, substantially as described.

2. The combination with a sheet-feeding machine, of a wheel and another member, said

wheel being adapted to permit the passage of a predetermined thickness of material between it and said other member and having a portion of its rim flattened or cut away, means adapted to normally hold the wheel with its said flattened or cut-away portion away from said other member during the passage of material and to permit its rotation when a thicker quantity is attempted to be passed, and means actuated by the rotation of said wheel for operating power-shifting devices, substantially as specified.

3. The combination with a sheet-feeding machine, of a wheel and another member, said wheel being adapted to permit the passage of a predetermined thickness of material between it and said other member and to be rotated when a thicker quantity of material is attempted to be so passed, a pipe, means for creating a vacuum therein, pneumatically-operated power-shifting devices connected with said pipe and adapted to be caused to operate by the destruction of the vacuum in said pipe, and means for destroying such vacuum through the rotation of said wheel, substantially as described.

4. The combination with a sheet-feeding machine, of a wheel and another member, said wheel being adapted to permit the passage of a predetermined thickness of material between it and said other member and to be rotated when a thicker quantity of material is attempted to be so passed, a pipe, means for creating a vacuum therein, pneumatically-operated power-shifting devices connected with said pipe and adapted to be caused to operate by the destruction of the vacuum in said pipe, a valve in said pipe, and means for turning said valve through the rotation of the wheel, substantially as described.

5. The combination with a sheet-feeding machine, of a wheel and another member, said wheel being adapted to permit the passage of a predetermined thickness of material between it and said other member and to be rotated when a thicker quantity of material is attempted to be so passed, a pipe, means for creating a vacuum therein, pneumatically-operated power-shifting devices connected with said pipe and adapted to be caused to operate by the destruction of the vacuum in said pipe, a valve in said pipe, and a rod connected with said valve and adapted to be moved as the wheel is rotated to turn the valve, substantially as described.

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Witnesses:

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