

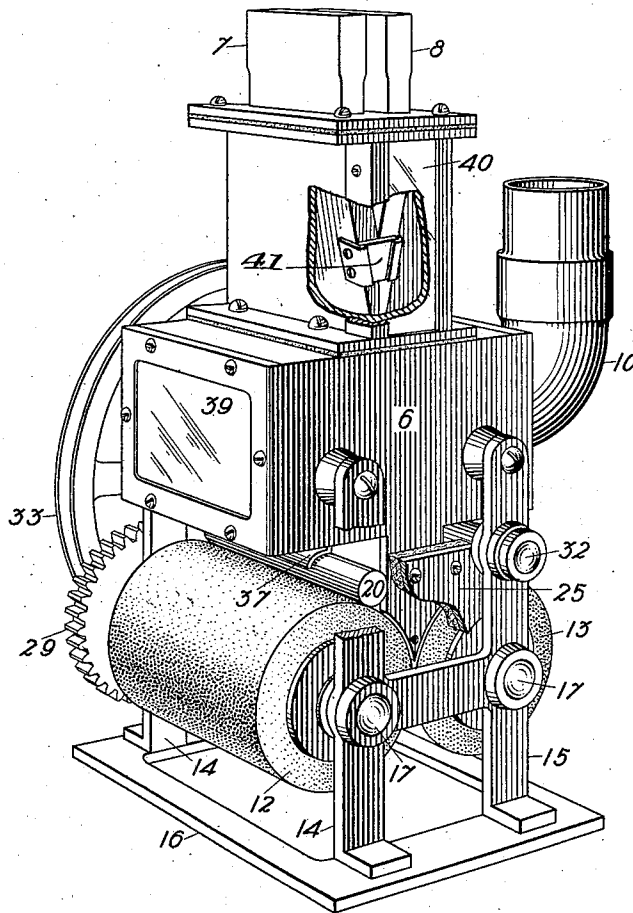
A. F. DIXON.
PNEUMATIC VALVE.
APPLICATION FILED APR. 20, 1910.

1,065,924.

Patented July 1, 1913.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Morgan Washburn Jr.
J. P. M. Entosh.

Inventor:
Amos F. Dixon.
by J. C. Kinner, Atty.

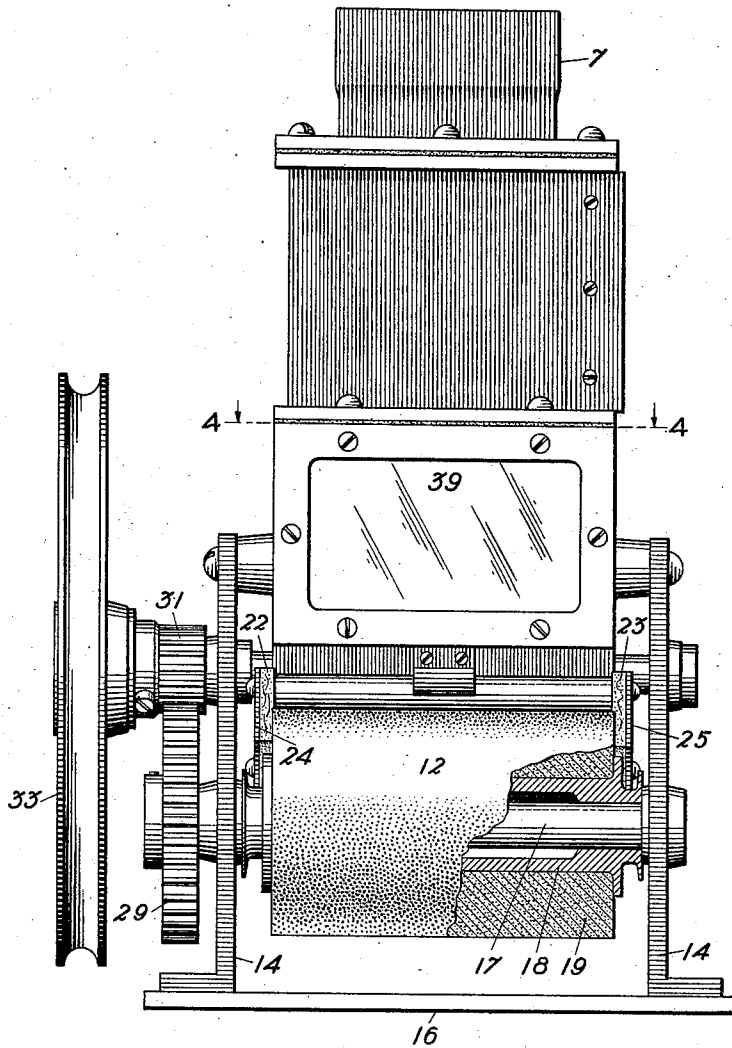
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5 SHEETS—SHEET 2.

Fig. 2.



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Amos F. Dixon.
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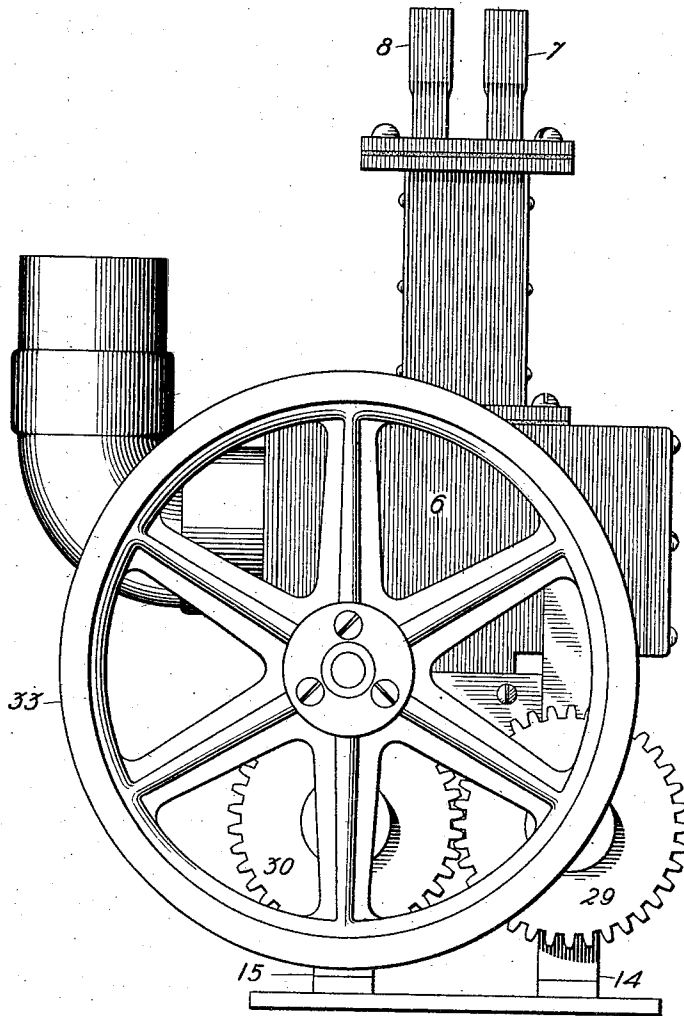
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5 SHEETS—SHEET 3.

Fig. 3.



Witnesses:
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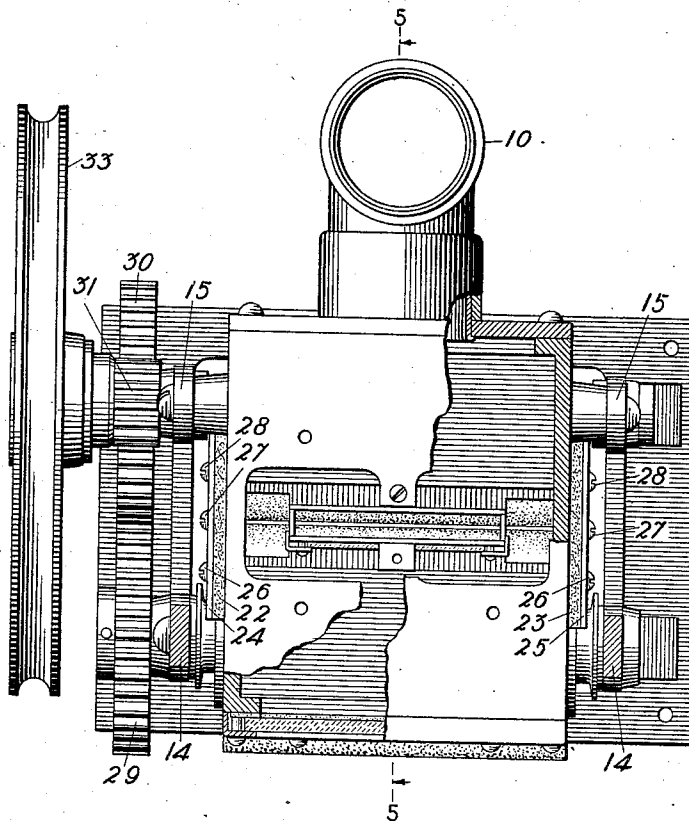
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5 SHEETS—SHEET 4.

Fig. 4.



Witnesses:
Morgan Washburn Jr.
J. P. McIntosh.

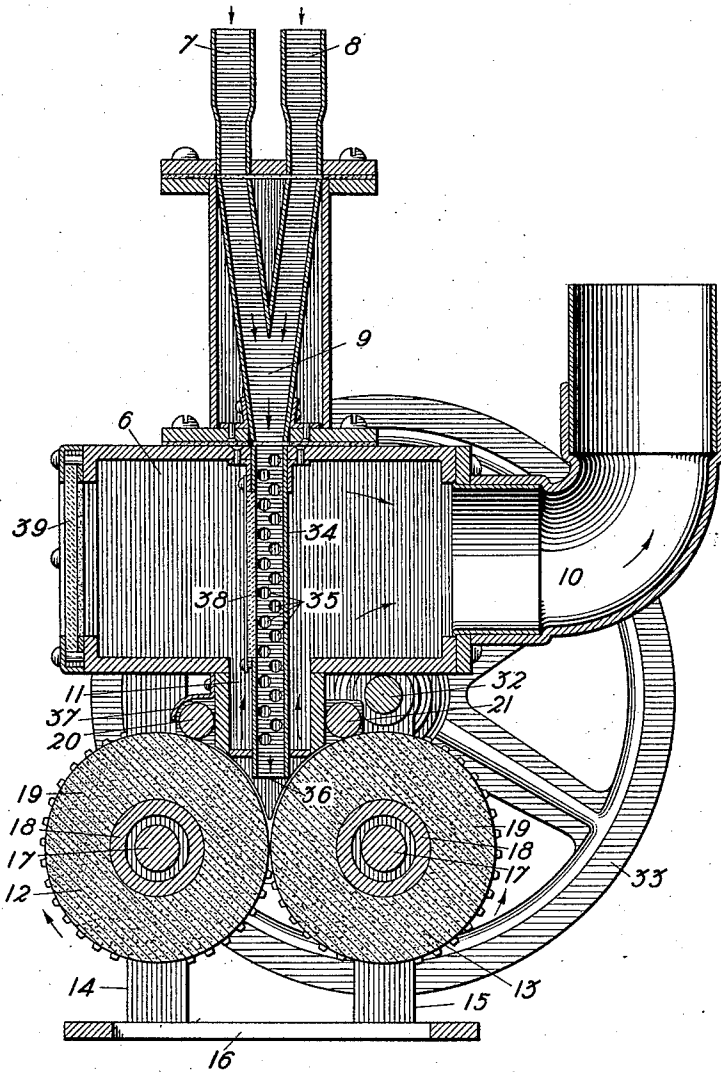
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5 SHEETS—SHEET 5.

Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

AMOS F. DIXON, OF NEWARK, NEW JERSEY, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF ILLINOIS.

PNEUMATIC VALVE.

1,065,924.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed April 20, 1910. Serial No. 556,489.

To all whom it may concern:

Be it known that I, AMOS F. DIXON, citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Pneumatic Valves, of which the following is a full, clear, concise, and exact description.

My invention relates to pneumatic conveyer systems and its object is to provide an improved valve for use with systems in which tickets or other light articles are carried through tubes from one point to another by means of air pressure.

Valves have been employed heretofore comprising a valve chamber having an opening in one wall and a pair of oppositely rotating exit rolls mounted adjacent said opening whereby tickets entering the chamber, and delivered to the rolls, are carried to the opposite side of said rolls. Such valves, in so far as I know, have heretofore been complex in structure, expensive and inefficient. Difficulty has moreover been experienced in making and keeping them air tight. By my invention a simple and efficient valve structure is provided.

In the valve of my invention the working parts are preferably all carried outside the valve chamber, the advantage of which is hereinafter more particularly set forth. The ticket exit rolls are mounted adjacent an opening in a wall of the valve chamber and idler sealing rolls are employed to close the opening between said exit rolls and adjacent walls, said idler rolls being so mounted as to be capable of transverse movement whereby they may adapt themselves to the surfaces against which they bear and automatically exert a uniform pressure. Preferably the exit rolls are covered with soft rubber in order not only that their line of contact may be air tight, but that they may yield slightly and thereby readily allow the ticket to pass through. If the exit rolls were placed in direct frictional contact with the adjacent walls they would obviously be subjected to wear, resulting in their premature break down under continued use. The efficiency would moreover be reduced by the power consumed in frictional losses. By interposing the loosely mounted sealing rolls the use of rubber covered exit rolls becomes possible and the frictional contact eliminated results in increased efficiency. The escape

of air along the end surfaces of the exit and sealing rolls may be prevented by the use of gaskets held in place by suitable means as hereinafter described.

A feature of my invention lies in the shaping of the valve chamber and the relation thereto of the exit rolls and the exit tube. The valve chamber has a narrow portion extending downwardly so as to lie part way between the exit rolls, the idler rolls resting on the inwardly inclined upper surfaces of the exit rolls and against the side walls of this narrow portion of the chamber. The exit tube extends through the chamber including the narrow portion thereof, and has openings in its edge walls throughout its length in said chamber, the purpose of this arrangement being hereinafter set forth.

The rotary valve of my invention has been found particularly useful in connection with the pneumatic ticket distributing systems now extensively employed in the toll offices of telephone exchange systems. In such systems tickets of rectangular form are used in recording the data pertaining to toll connections, and, during the process of securing a connection, are passed from one to another of various members of the operating force in the office through tubes carrying a current of air, the ticket being bent transversely to form a flap, before inserting it in the tube, whereby the air acts on said flap to cause the advance of the ticket. The ticket, after reaching its destination, may be removed from the tube by means of a manually operated valve. Where, however, the volume of tickets passing through a given tube to a single point is so large as to prohibit the use of a manually operated valve, valves which are capable of automatically delivering the tickets are employed. It is to tubes of this class that the valve of my invention is more especially applicable.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the valve partly broken away; Fig. 2 is a front view partly broken away to show the construction of the exit rolls; Fig. 3 is a side view showing the driving mechanism; Fig. 4 is a plan view partly broken away and with the tube connections removed; and Fig. 5 is a sectional view on the line 5—5 of Fig. 4.

Referring to the drawings 6 is the valve

chamber having connection at the top with ticket tubes 7 and 8 through the medium of the connector 9, and at the rear with exhaust pipe 10. Extending from the bottom of the chamber 6 is a contracted outlet 11 on either side of which the exit rolls 12 and 13 may be carried as by journaling them in adjacent members 14, 15 of the frame 16 on which the valve as a whole is supported. The exit rolls 12 and 13 may each comprise a shaft 17 carrying a core 18 on which the rubber body portion 19 is molded or otherwise secured.

The rolls, although preferably in close proximity to the walls of the outlet, are not in contact therewith as shown in Fig. 5; the opening between said rolls and the outlet being closed by unjournalled idler sealing rolls 20 and 21, which rolls may be held in position in any suitable manner such that they are capable of slight transverse movement, whereby they may adapt themselves to the surfaces against which they bear. I have found that in a structure such as that shown in the drawings no special mounting for the sealing rolls need be provided, it being sufficient to allow said rolls to lie loosely on the exit rolls and against the walls of the outlet. A guard 37 may be provided to hold the roll 20 in position during shipment. As shown in Fig. 5 the shaft 32 serves as a guard for roll 21. It will be obvious that the direction of rotation of the exit rolls is such as to tend to keep the sealing rolls in position.

Leakage along the end surfaces of the rolls may be prevented in various ways as by gaskets 22 and 23 held in position by plates 24 and 25 respectively, which plates are in turn secured to the walls of the chamber by screws 26, 27 and 28.

Referring particularly to Figs. 2, 3, 4 and 5 the shafts 17 carrying the exit rolls are provided with intermeshing gears 29 and 30, the latter of which meshes with a pinion 31 carried by the driving shaft 32, which shaft is journaled in the frame 16. Suitable means, as for example the pulley 33, may be provided for connecting the shaft 32 with a source of power adapted to rotate the exit rolls at the desired speed.

Referring now more particularly to the parts involved in the delivery of the tickets to the rolls, 34 is a tube connected with the ticket tubes 7 and 8 through the medium of the connecting section 9. The sides of the tube 34 are formed with perforations 35 so that the air may pass from said tube in a direction parallel to the plane of the ticket and thereby not tend to bind said ticket to the walls of the tube. The space between the rolls and the square end 36 of the tube 34 provides an opening large enough to prevent undue shunting of the air by the perforations 35 and thereby maintains a current throughout the entire length of the tube

whereby the ticket is driven by the air until it reaches the exit rolls.

From the above it will be noted that in the valve of my invention the operating or movable parts are all carried outside the valve chamber, a feature which contributes materially to its simplicity and efficiency by reason of the consequent reduction of the surface subject to leakage.

In the tube 34 there is a window 38, and also directly opposite thereto a window 39 is provided in the chamber 6, these windows serving as means whereby the operation of the tickets may be observed. A similar window 40 is provided for a like purpose in the inclosure surrounding the connecting tube 9, a corresponding window 41 being provided in said tube itself.

The operation of my invention may be described as follows: Assuming that the tubes 7 and 8 are connected with suitable ticket tubes, as for example the common return tubes of a telephone toll ticket distributing system; that the pipe is connected with an exhauster; and that the driving pulley is suitably connected with a source of power; a current of air will flow through the system in the direction indicated by the arrows, namely, through the ticket tubes 7 and 8, the connector 9, the perforated tube 34, the valve chamber 6, the openings 35 and 36 and the pipe 10 to the exhauster. A ticket placed in this tube will be driven through the tubes and delivered to the exit rolls whereupon it will be caught and rolled from the interior of the chamber to the exterior.

It will be observed that when the valve of my invention is used with an exhaust system, as described above, the atmospheric pressure acts on the loosely carried sealing rolls to assist gravity in holding them in contact with their bearing surfaces.

Having described my invention, I claim:—

1. In a valve for pneumatic systems, a pair of exit rollers, a valve chamber located above said rollers and having its exit portion projecting part way between said rollers, a pair of unjournalled sealing rollers one of them resting upon each exit roller and engaging the outside of said chamber, and gaskets arranged to cooperate with the ends of said exit and sealing rollers and with the outer sides of said chamber adjacent thereto.

2. The combination with a valve chamber adapted for connection with a pneumatic system, of a pair of rolls mounted exteriorly of said chamber and adjacent an opening therein, said chamber having a narrow portion extending part way between said rolls but not in contact therewith, and idler rolls between said rolls and the walls of the narrow portion of said chamber.

3. The combination with a valve chamber adapted for connection with a pneumatic system, of a pair of rolls mounted exteriorly of said chamber and beneath an opening therein, said chamber having a narrow portion which projects part way between said rolls, and idler rolls between said rolls and the adjacent walls of the narrow portion of said chamber. 15
- 5 4. The combination with a valve chamber adapted for connection with a pneumatic system, of a pair of rolls mounted exteriorly of said chamber and adjacent an opening therein, said chamber having a narrow por- 20
- tion extending part way between said rolls, an ejector tube extending through said chamber and said narrow portion, said tube having perforations in its edge walls throughout its length in said chamber, and idler rolls between said rolls and the side walls of the narrow portion of said chamber.
- In witness whereof, I, hereunto subscribe my name this 18th day of April A. D., 1910.
- AMOS F. DIXON.
- Witnesses:
- IRVING MACDONALD,
MORGAN WASHBURN, Jr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."