(No Model.)

M. A. CLENNAM.

PNEUMATIC RAILWAY.

No. 423,130. Patented Mar. 11, 1890.

Fig. 1.

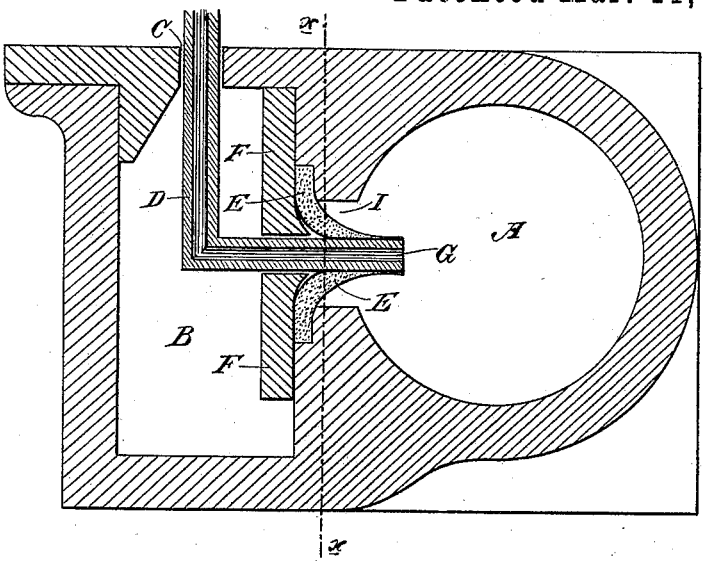


Fig. 2.

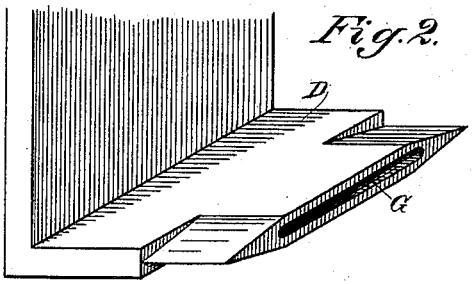
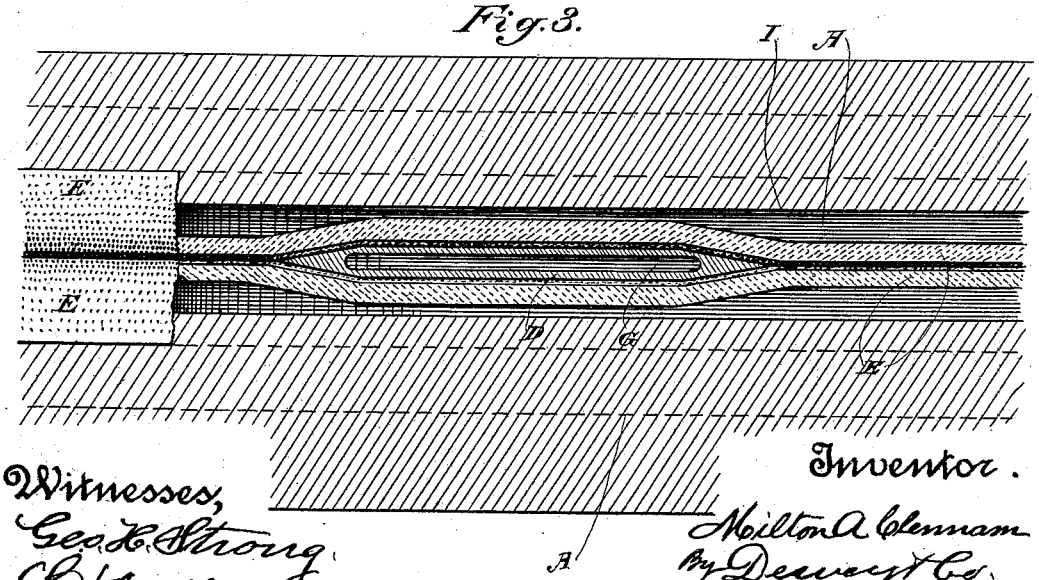


Fig. 3.



Witnesses,
Geo. E. Strong
S. Whitmore

Inventor.
Milton A. Clennam
By Dewey & Co.
attys

UNITED STATES PATENT OFFICE.

MILTON A. CLENNAM, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO CHARLES M. PREVEAR, OF SAME PLACE.

PNEUMATIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 423,130, dated March 11, 1890.

Application filed August 30, 1889. Serial No. 322,444. (No model.)

To all whom it may concern:

Be it known that I, MILTON A. CLENNAM, of the city and county of San Francisco, State of California, have invented an Improvement in Pneumatic Railways; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in pneumatic railways; and it consists, essentially, of a continuous tube and a novel continuous valve, whereby communication may be continuously made and cut off between the tube and the connecting device which conveys the air from the tube to the car and the motor thereon.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a transverse section of the tube, showing the flexible valve and the connecting device by which air is transmitted from the tube to the car. Fig. 2 is a perspective view of this connecting transmitting device. Fig. 3 is a longitudinal section through *x x* of Fig. 1.

A is a tube, which may be made of any suitable material, preferably of iron, and of a size and shape best adapted for the purpose of conveying air, which may be compressed into the tube from one or more stations, so that the tube will be charged with air under as great a pressure as may be needed for the purpose for which it is to be used.

In the present case I have shown the tube A of a circular interior cross-section and having an extension cast or formed with it to one side, within which is formed a supplemental channel B. This channel has a slot C, made in the upper side, which is of sufficient size to allow the connecting tube or conveyer D from the traveling car or motor to extend downward through the slot and into the chamber B in the same manner that the grip-shank of a cable railway extends into the cable tube or tunnel. The connection of this conveyer with the car or motor thereon is not here shown, as it forms no part of my present invention; but it is manifest that the tubes may be placed between the rails upon which the cars travel, or at one side or the other, as may be found most convenient for making the proper connection.

Within the channel B the conveyer D is bent at right angles, as shown, and this portion, which extends at right angles, passes into the compressed air-tube A through what I term a "continuous valve." This valve consists of the flexible strips E, which are secured upon the upper and lower sides of the continuous slot or channel I, which is made through the side of the tube A. These strips are secured in any suitable or convenient manner. In the present case I have shown them as having one edge of each strip lying in a depressed channel, these channels extending along the sides of the tube A, above and below the slot or opening, so that one of the strips E is clamped into the channel above and the other into a suitable channel below. The inner edges of the flexible strips E bend inwardly, so as to project toward the center of the tube A, and are also beveled down or made thinner where they meet each other. From this construction it will readily be seen that the tendency of these strips is to close together by reason of their elasticity, and this tendency is aided and a tight joint is made between them by the pressure of the air within the tube A, which tends to force the edges closely together.

The conductor D is preferably in the form of an elongated plate, having a slot extending through it of sufficient size to convey as much air as may be needed from the tube A to the car, and the portion which is bent at right angles, so as to enter between the strips E, is made tapering and drawn down to a knife-edge at each end, as shown in Fig. 2, the central portion of it being of sufficient thickness to allow the slot G of the proper diameter to be made in it. It will be manifest that when this portion of the conductor lies between the flexible strips E the strips will be pressed closely against its sides, and also following the inclines or tapering portion of the conductor at each end will gradually approach each other, and finally close against each other both in front of and behind the conductor. When the car is in motion, this conductor simply opens or separates these flexible strips at the front and they close again behind it, the construction being such that little or no leakage can occur during the operation.

By this means I am enabled to keep up a constant communication between the car and its motor and the tube in which the compressed air is conveyed along the track.

If at any time it is necessary to diverge the tube, as for the purpose of crossing a cable-railway track or other crossing where it would be necessary to cut the tube or to diverge it, it is first carried slightly to one side, so as to allow the conductor D to be thrown out of the tube, and the tube is then bent or curved so as to pass beneath the cable-railway tube or tunnel or other intercepting device which it is to cross. The guides F, however, will be continued straight along, so that the conductor D will be held in its place between these guides, and when the tube is again brought to the proper position to allow the conductor to again enter it these guides will direct the end of the conductor so that it will readily pass between the flexible strips E and again establish communication with the tube. This tube may be of comparatively small diameter and run very close to the surface.

It will be manifest that various modifications of my flexible valve mechanism may be employed; but the arrangement which I have here shown seems to be a convenient one for the purpose.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pneumatic railway, a continuous air-conveying tube having a slot at one side in the horizontal plane of its axis, and a supplemental tube or channel at one side of the first tube into which the slot opens, said second channel having a slot in the upper part to admit the shank of the traveling conveyer D, substantially as described.

2. In a pneumatic railway, an air-conveying tube having a slot at one side in the horizontal plane of its axis and flexible strips forming valves to close the slot, a supplemental tube or channel into which the valved slot opens, an open slot in the top of the supplemental channel, and a traveling conveyer extending down from the car through the open slot and bent at right angles within the supplemental channel, so as to enter the slot in the air-tube, substantially as described.

3. In a pneumatic railway, an air-conveying tube having a slot in one side in the horizontal plane of its axis, grooves or channels above and below the slot, and flexible valves or strips having their outer edges clamped into the channels and their inner edges projecting inwardly into the tube and beveled or made thinner at their meeting edges, substantially as described.

4. In a pneumatic railway, an air-conveying tube having a slot in one side in the horizontal plane of its axis, flexible valves or strips with their outer edges clamped in grooves above and below the slot and their inner edges extending into the tube and meeting, as shown, a traveling conveyer extending down at one side of the tube and having a flat horizontal beveled extension adapted to enter and travel between the flexible strips and supplemental guides, between which the extension travels, so that it may leave the tube or be returned into it, substantially as described.

5. A conveying-tube having the continuous slot and flexible valves upon one side, a second tube or channel parallel therewith and into which the slot opens, a conductor through which connection is made between the car and the conveying-tube, said conductor extending into the supplemental channel through a slot in the top and having a flat horizontal beveled extension to enter the tube between the flexible valves, and supplemental guides between which said extension travels, substantially as described.

6. The slotted continuous air-tube having the flexible strips or closing-valve and the guide, a second tube or channel extending parallel with the air-tube, and the conductor or conveyer by which the connection is made between said tube and the car, said conductor extending into the supplemental channel through a slot in the top and from thence passing between the flexible valves, the front and rear edges of said conductor being beveled, substantially as described.

In witness whereof I have hereunto set my hand.

MILTON A. CLENNAM.

Witnesses:
S. H. NOURSE,
H. C. LEE.