

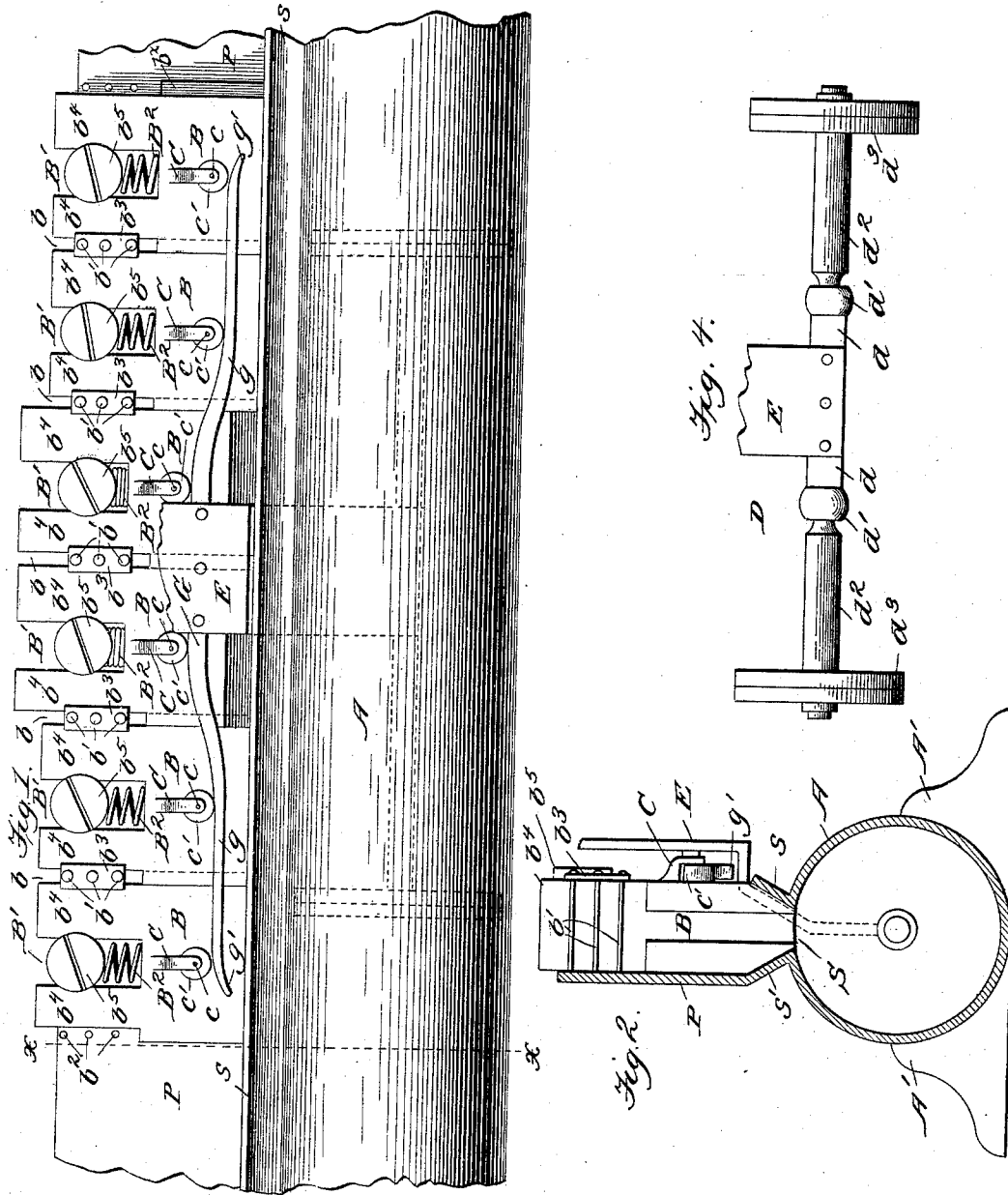
(No Model.)

2 Sheets—Sheet 1.

L. H. MAYER.
PNEUMATIC PROPELLER.

No. 520,004.

Patented May 15, 1894.



Witnesses

Edwin L. Bradford
Jas. W. Jacobson

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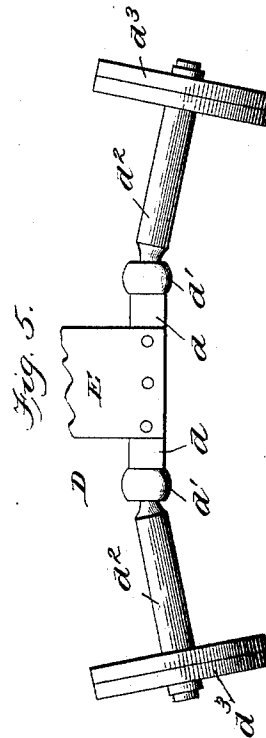
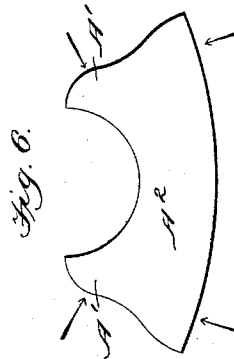
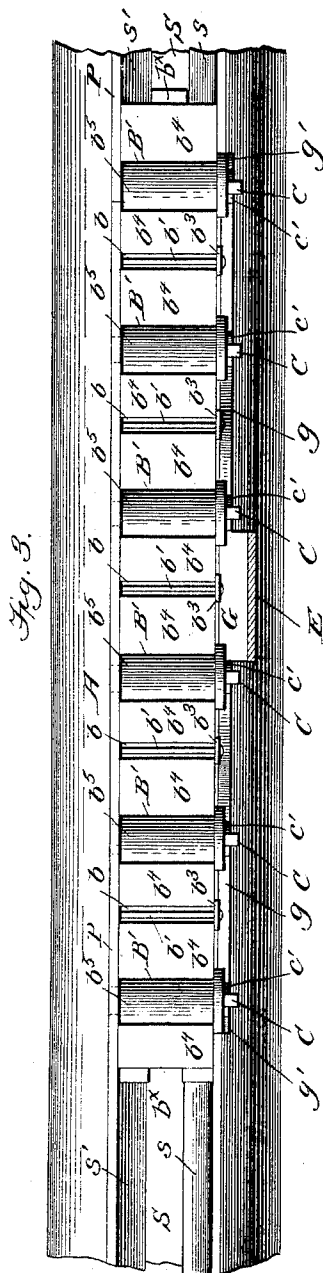
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UNITED STATES PATENT OFFICE.

LOUIS H. MAYER, OF PHILADELPHIA, PENNSYLVANIA.

PNEUMATIC PROPELLER.

SPECIFICATION forming part of Letters Patent No. 520,004, dated May 15, 1894.

Application filed February 24, 1894. Serial No. 501,388. (No model.)

To all whom it may concern:

Be it known that I, LOUIS H. MAYER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Propellers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to pneumatic propellers, and consists in novel and useful means for opening and closing the tube, through which the air current passes, whereby admission and exclusion of air are controlled, to prevent leakage and loss of power.

My invention further consists in a plunger, provided with a jointed piston, that is enabled to readily pass through tubes of the track in a right line or at any angle or curve.

My invention is hereinafter fully described, illustrated in the drawings, and specifically pointed out in the claims.

Referring to the accompanying drawings, wherein like letters of reference point out similar parts on each view—Figure 1 represents a portion of a pneumatic tube, provided with closing gates, according to my invention. Fig. 2 is a sectional view on the line, *x, x*, of Fig. 1. Fig. 3 is a top plan view of a section of the tube, with gates removed from portion of the slot running lengthwise thereof. Fig. 4 represents the plunger, consisting of a jointed piston rod, with terminal disks, shown in a right line. Fig. 5 is a view of the plunger showing the piston sections turned in position as passing through curves. Fig. 6 is a detail view of the tube supporting bracket and integral base plate.

In the drawings,—A, represents a tube, having longitudinal slot, S, which in practice when employed for passenger cars or other traction vehicles, extends the whole length of the route through which they are to travel. When used for this purpose I provide a series of supporting brackets, A', with invertedly curved inner faces conforming to the hemispherical portion of the tube seated therein, to prevent lateral displacement. Any number of such brackets may be employed for the purpose set forth. They may be in

separate sections as illustrated in Fig. 2, or uprise from a base plate, A², and integral therewith, as shown in Fig. 6. In this form it is preferable that the lower face of the base should be downwardly curved, by which conformation there will be concurrent support for the tube from every direction which will prevent any displacement thereof, when force is applied thereto, by exhaust or compression of the air main, as said integral base and brackets will afford resistance from every angle unitedly, as indicated by arrows on Fig. 6. The tube has a continuous slot, S, from which extend opposite outwardly inclined flanges, s, s'. From the rear flange, s', and integral therewith, there extends a vertical back plate, p, for a purpose presently set forth.

B, represents solid closing valves, herein called gates, having each a quadrangular body, with a lower end inclined to conform to inner faces of flanges, s, s', of tube, A, into which the lower ends of said gates will fit closely when falling within said flanges and prevent escape of air. In carrying out my invention the slotted tube is provided the whole length of the route, with a series of gates, B, adjusted to successively open and close its slot in manner and form hereinafter set forth. The opposite inclines at the lower terminals of the gates do not continue to a point, the apex being cut away so that no portion thereof will extend into the tube, when closed thereby, as plainly illustrated in Fig. 2. The opposite sides of the gates, for a given distance of length thereof, are tongued and grooved as indicated at *b^x*, Figs. 1 and 3 whereby when they are respectively moved, upwardly and downwardly on one another, they will always be maintained in true vertical alignment. Above said grooves and tongues there appear, between each two gates, open spaces, *b*, through which are passed a series of transverse rods, *b'*, secured rearwardly to back plate, P, in recesses, *b²* formed to receive them; the opposite ends of said rods being fastened to clamp, *b³*, of greater width than the open spaces, *b*, and overlapping two juxtaposing gates, acting as a guide, when they ascend and descend, and in combination with other described members, preventing any movement of said gates other than vertical. Each gate, from its upper end to about a

median point of its length, has a quadrangular opening, B', thus composing a bifurcated upper section, having forks, b⁴.

To the lower face of the opening, B', is fastened a spiral spring, B², the upper end of which is fastened to a screw bolt, b⁵, which passes transversely through the forked opening at the upper end of each gate and is secured to back plate, P. The front of said bolt has a head, of ordinary construction, of larger diameter than the width of opening, B', by which means the spring, B², is kept normally extended when the gate is lowered and compressed when lifted up as shown in Fig. 1, of the drawings.

The several gates are elevated in a manner presently described, and when relieved from force, applied for that purpose, immediately return downwardly by the combined action of gravitation and resiliency of springs, B², fastened at their upper ends to a series of screw bolts, said bolts all being firmly maintained in horizontal alignment as hereinbefore described, and illustrated in Fig. 1.

C, is a bracket extending outwardly from the front surface of each gate, orificed at its lower forward end, into which and a socket in alignment therewith, on the face of the gate, are secured opposite ends of rod, c, upon which is journaled revoluble friction wheel, c'.

D, is the plunger, from the center of which rises an arm, E, which is connected to the car, or vehicle, that is to be transmitted along the route on which the air main and its inclosing tube are extended. Said arm, as is common in analogous devices, passes through the tube slot. In carrying out my invention I connect to said arm a colter, G, consisting of a bar curved upwardly at its center, and from thence having arms, g, with pointed ends, g', curved downwardly. As the arm, E, traverses along the route the pointed end of the attached colter will be guided under one of the friction wheels, c', and, as said arm progresses, when the upwardly curved central section reaches said wheels it will lift each gate in succession, and when released from such upward pressure they will each, by resiliency of spring, B², and force of gravitation, drop downwardly and close the tube.

The plunger, D, has a rigid central bar, d, to which are connected by ball and socket joints, d', piston arms, d², d³, provided with end disks, d³, of any suitable character. By this construction great advantages are secured over devices of analogous description which are provided with rigid pistons made in one continuous length.

A plunger of the construction herein shown and described is adapted to be projected in a right line along the air main of a straight tube, but by means of the sectional arms d², connected to central bar, d, by joints, d', will be enabled to turn any curve or angle and recover a straight line when entering a straight pathway of the air main without any additional mechanism or guiding.

From the foregoing description, in connection with the drawings, the nature and object of my invention and its practical operation, will be readily understood by all familiar with analogous devices. As the air main is acted on by exhaustion or compression or both, the plunger will be caused to travel within the tube and the approaching pointed end of the colter will be guided under the friction wheels journaled upon the outer face of each gate; when the upwardly inclined central portion of the colter reaches said wheels, it will lift the gates from which they extend, and as the arm, E, travels, each gate, that has been elevated, will by gravity and resiliency of the attached buffer spring, fall into the tube slot and hermetically close the opening made by lifting the respective gates. It will be observed that the colter has arms extending lengthwise, at each side of the raised central section thereof, whereby there will be no sudden blow or jolt, given to the several gates, as acted on in the manner described. Only a single extending arm would be required if movement along the track was always in one direction but as the plunger with its connections is adapted to reciprocatingly travel along the route, the opposite arms of the colter afford means to guide it in whichever direction movement is imparted to the device.

Having now fully described my invention and the manner of its operation, what I claim, and desire to secure by Letters Patent of the United States of America, is—

1. The combination of the longitudinally slotted pneumatic tube, having outwardly inclined flaring flanges extending from its slot, with closing gates, B, provided with tongues and grooves b^x extending a predetermined distance at juxtaposing sides thereof, whereby an intermediate upper open space, b, will appear between each pair of gates, transverse rods, b', extending through said opening secured at one end to vertical back plate, P, and at their opposite end to a clamp of greater width than the open space, b, and means for elevating the gates in succession, substantially as described.

2. A pneumatic tube provided with longitudinal slot, having oppositely inclined flanges extending outwardly therefrom, the weighted gates, B, having quadrangular body, the lower end of which conforms to inner inclines of said flanges, the upper section of the gates bifurcated to compose forks, b⁴, and intermediate opening, B', the opposite edges of the gates being tongued and grooved a partial distance of their length, each gate having next below its bifurcated opening an outwardly extending bracket, C, the lower end of which carries shaft, c, fastened rearwardly to the face of the gate, on which is journaled revoluble friction wheel, c', each of said gates being supplied with buffer spring, B², secured at the lower end of its upper opening, and fastened at its upper end to the screw bolt, b⁵, having

a disk head of larger diameter than said opening, and means for moving said gates, vertically, as and for the purpose intended, substantially as described.

5 3. A longitudinally slotted pneumatic tube having outwardly obliquely inclined flanges extending from its slot, the vertical back plate, P, to which are secured screw bolts, b^5 ,
10 passing transversely through bifurcated openings of vertically movable gates, B, and aligning rods, b' , each of said gates having on its outer face an extending bracket, C, in which is journaled friction wheel c' , in combination
15 with arched colter, G, fastened to arm, E, upwardly extending through the tube slot and secured to a traveling plunger movable along the air main of the tube, whereby as motion is imparted to said plunger, by ex-
20 haust or compression, and the colter, connected to the arm extending through the slot, comes in contact with said friction wheels, the respective gates will be lifted vertically,
25 and by resiliency of buffer spring, extending downwardly from screw bolts, b^5 , and gravitation, each gate will in succession descend as the colter is transmitted along the route, and the lower oblique ends of the gates will fall into the conforming faces of the slot flanges, and hermetically close said slot, as

and for the purpose intended, substantially 30 as described.

4. In a pneumatic transmitting device a tube, having a longitudinal slot, adapted to be opened and closed in sections by vertically movable spring controlled gravitating 35 gates, the lower ends of which conform to opposite obliquely inclined face planes of flanges extending from the slot, traveling plunger, D, adapted to pass along the air main of the route, having extending upwardly from its 40 center arm E, and attached thereto colter, G, the central portion of which is upwardly inclined, from which extend downwardly curved arms, g , with pointed ends, g' , in combination with friction rollers, journaled in brackets on 45 the face of each closing gate whereby as said colter is transmitted, by movement of the plunger along the route, it will be led under said friction rollers and lift each gate in succession, substantially as described. 50

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

LOUIS H. MAYER.

Witnesses:

THEO. J. HAHN,
JEROME J. HINDS.