(No Model.)

C. H. GOEBEL.

PNEUMATIC PROPELLER FOR CARS.

No. 376,984. Patented Jan. 24, 1888.

Fig. 1.

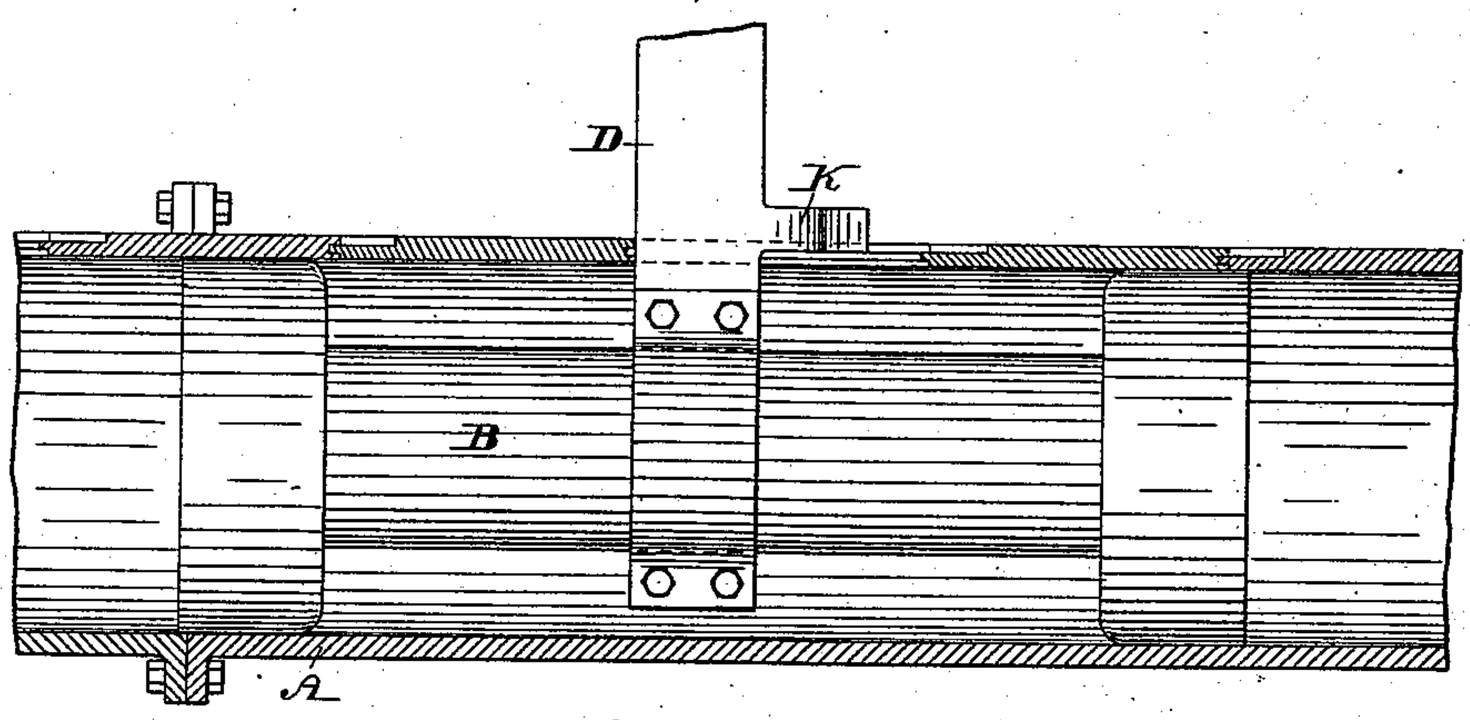


Fig. 2.

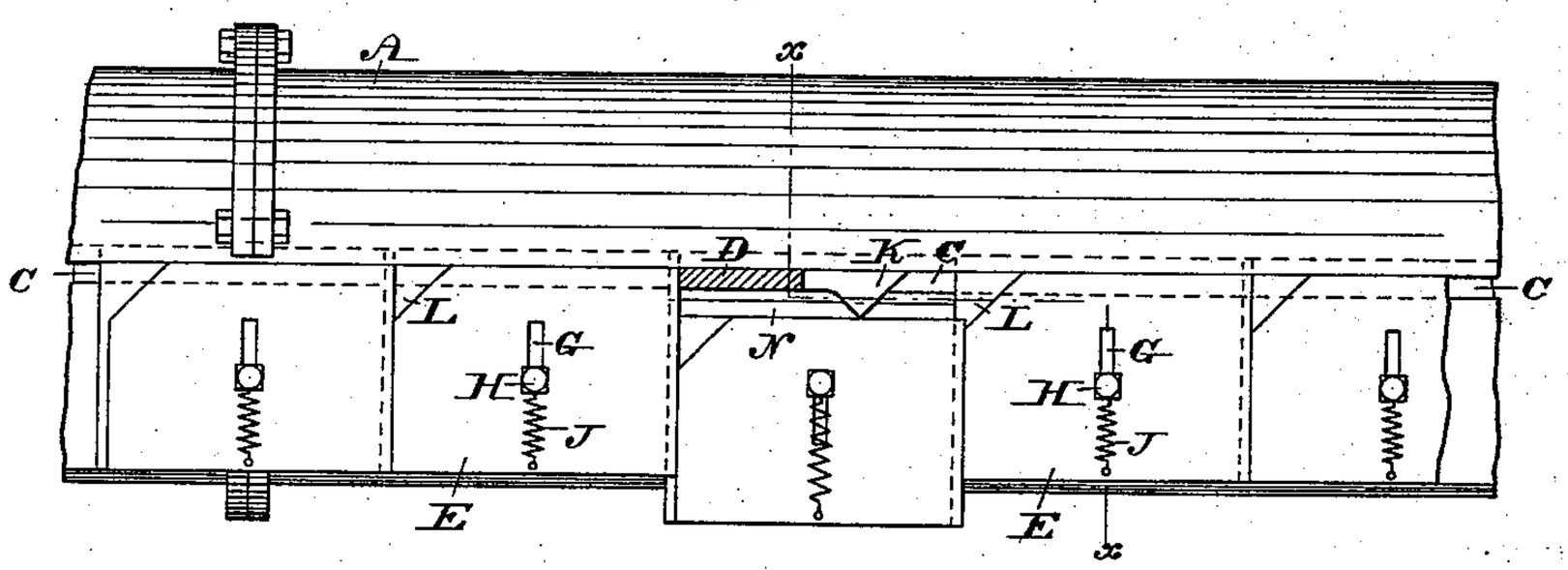


Fig. 3.

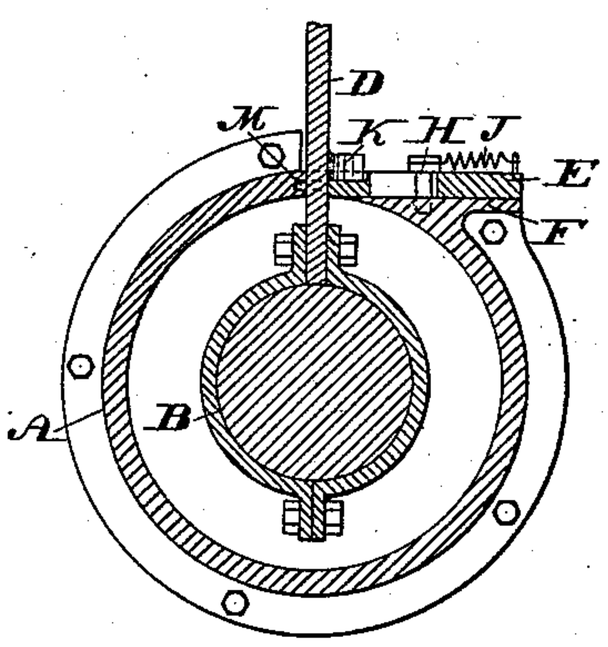
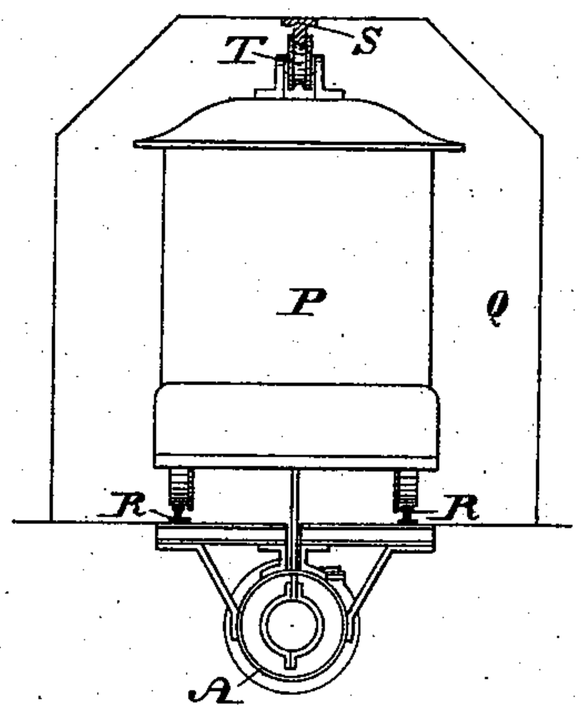


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PNEUMATIC PROPELLER FOR CARS.

SPECIFICATION forming part of Letters Patent No. 376,984, dated January 24, 1888.

Application filed March 12, 1887. Serial No. 230,625. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN H. GOEBEL, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Pneumatic Propellers for Cars, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 represents a longitudinal section of a pneumatic propeller for a car embodying my invention. Fig. 2 represents a top or plan view thereof. Fig. 3 represents a section in line *x x*, Fig. 2. Fig. 4 represents an end view thereof including a car and conduit on a reduced scale.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a pneumatic propeller for a car or other vehicle, formed of a tube containing a plunger and provided with gates which are successively opened by the connecting device of the plunger and car, said gates being normally closed, so as to permit a vacuum in the tube in the advance of the plunger, then opening to allow the passage of the aforesaid connecting device, and finally closing, so as to permit the plunger to be subjected to pressure at rear. By these means the plunger, and consequently the car or other vehicle, may be propelled with great rapidity.

It further consists of means for preventing the car from leaving its tracks.

Referring to the drawings, A represents a tube, which is properly laid in a trench or otherwise supported, as desired, and containing a plunger, B, which is properly packed so as to have an air-tight joint with said tube. The upper portion of the tube has a longitudinally-extending slot, C, through which passes an arm or bar, D, which is firmly secured to the plunger B. At the top of the tube are sliding gates E, which are adapted to close the slot C, the same being placed horizontally side by side throughout the length of the tube and tongued and grooved so as to form tight joints between the edges that are in contact, the tube having a ledge, F, which projects from the periphery thereof and serves to sustain the gates E in their opening and closing motions. The gates have slots G, which extend in transverse direction and receive bolts H, which are secured to the top of the tube at or about the ledge F thereof, and serve to guide the gates and prevent displacement thereof. Connected with each gate and its respective bolt H is a spring, J, the object whereof is to close the gate and hold it in closed position.

The arm or bar D has secured to or formed with it a wedge-shaped or inclined lug, K, which is so disposed that when it is in motion it strikes what may be termed the "inner" ends of the gates, and thereby forces them laterally, whereby they are opened and the slot C is uncovered.

To prevent abrupt action of the lug K on the gates, the latter have at their corners inclined shoulders L, which are adapted to be struck by said lug, it being noticed that the lug rides over each corner of a gate in the space formed by the shoulder L thereof prior to contact with said shoulder, this construction of the corners avoiding openings thereof when the gates are closed.

In the wall of the slot C opposite to the ledge F is a groove, M, to receive tongues N, formed on the inner ends of the gates E, whereby the gates when closed form tight joints with said wall.

The upper end of the arm or bar D is connected with a car, P, which is inclosed in a conduit, Q, the latter having rails R, on which said car runs. To the top of the conduit is secured a track or rail, S, on which run grooved rollers or pulleys T, which are mounted on the car at the top thereof, whereby the car is guided at top and bottom and prevented from leaving its track in the conduit.

The plunger is made of the length of several gates E, so that as it is propelled it affords ample time for the gates to close before reaching the same.

The operation is as follows: Air is exhausted in the tube in advance of the plunger and pressure created therein at the rear thereof, whereby the plunger is forcibly propelled, the car being, as is evident, carried along with the same, the motion being of great rapidity.

When the lug K reaches a gate, it presses against the same and opens it, so that the arm or bar D is permitted to pass through the slot C. When the lug clears the open gate, the latter quickly closes, owing to the action of the spring J, the closing of the gate being occasioned before the rear of the plunger reaches said gate, whereby the air under pressure in the tube is prevented from escaping. As the lug K is behind the front end of the plunger, no gate is opened in advance of said end. Consequently the vacuum in the tube in front of the plunger is preserved.

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

1. A device of the character described, having a slotted tube which is provided with sliding gates having inclined shoulders, a plunger in said tube, and an arm connected with said plunger, having a wedge-shaped lug adapted to be brought in contact with said inclined shoulders, the parts being combined substantially as and for the purpose set forth.

2. A device of the character herein described, having a slotted tube with slotted sliding gates thereon, a plunger with an arm provided with a lug, and the bolts H, secured to the top of said tube, substantially as and for the purpose set forth.

3. A slotted tube and a plunger therein, in combination with sliding gates and opening and closing devices therefor, said gates having tongues and grooves, substantially as and for the purpose set forth.

4. A slotted tube and a plunger therein, in combination with sliding gates and operating devices therefor, said tube and gates having grooves and tongues, substantially as and for the purpose set forth.

5. In a device of the character herein described, a slotted tube, in combination with slotted gates thereon, having inclined shoulder L, a plunger with an arm provided with the wedge-shaped lug K, the bolts H, secured to said tube and located in the slots of said gates, and springs adapted to close said gates, substantially as described.

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