

(No Model.)

A. & F. E. KEHL.  
PUMP FOR PNEUMATIC TIRES.

No. 591,229.

Patented Oct. 5, 1897.

Fig. 1.

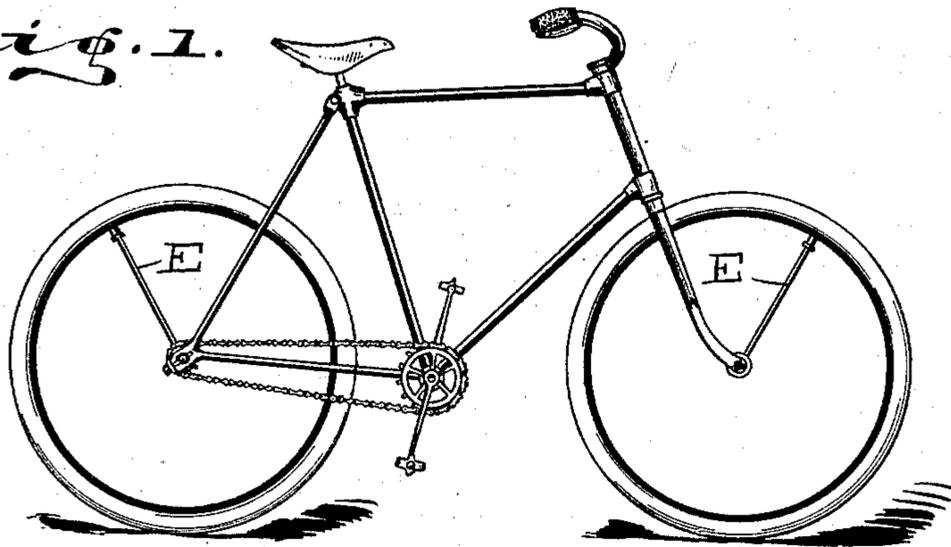


Fig. 2.

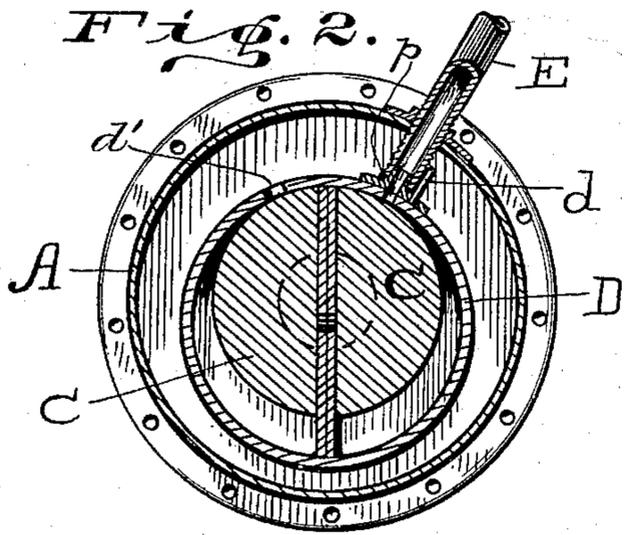


Fig. 3.

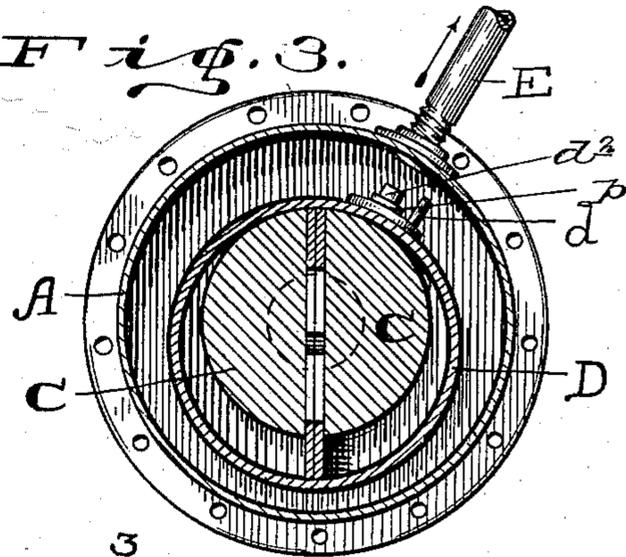


Fig. 4.

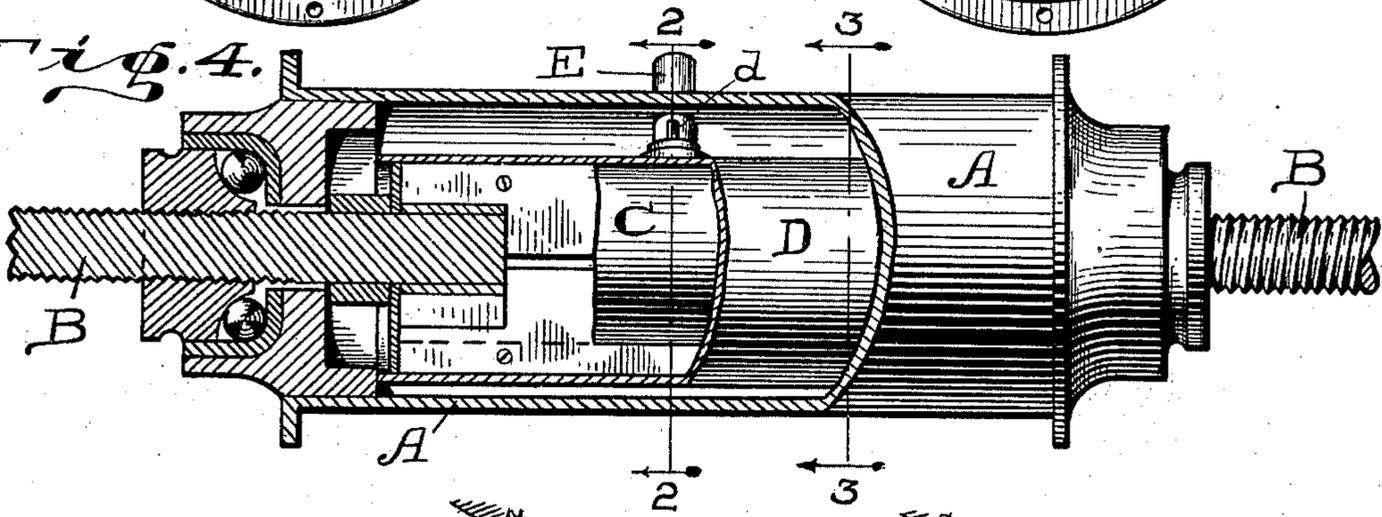


Fig. 5.

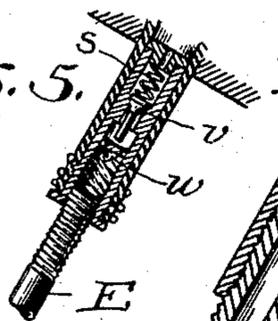


Fig. 7.

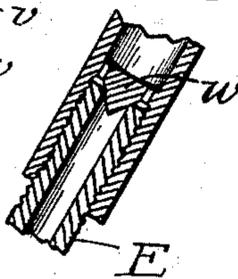


Fig. 6.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ANTHONY KEHL AND FRANK E. KEHL, OF CONNERSVILLE, INDIANA, ASSIGNORS OF TWO-THIRDS TO WILLIAM E. HEEB, CATHERINE I. KEHL, AND DOMIAN L. KEHL, OF SAME PLACE, AND GEORGE RECH, OF INDIANAPOLIS, INDIANA.

## PUMP FOR PNEUMATIC TIRES.

SPECIFICATION forming part of Letters Patent No. 591,229, dated October 5, 1897.

Application filed June 5, 1897. Serial No. 639,598. (No model.)

*To all whom it may concern:*

Be it known that we, ANTHONY KEHL and FRANK E. KEHL, citizens of the United States, residing at Connerville, in the county of Fayette and State of Indiana, have invented certain new and useful Improvements in Pumping Attachments for Pneumatic Tires of Vehicles, of which the following is a specification.

The object of our said invention is to provide a convenient means for inflating the tires of vehicle-wheels by power from the wheels themselves during the time the wheels are being revolved.

Said invention consists of a pump located inside the hub of the wheel on the shaft thereof and a tube extending from said pump to the rim of the tire, where it connects with the usual tire-valve, said tube being adapted by proper manipulation to be connected to or disconnected from the discharge-opening of the pump.

Referring to the accompanying drawings, which are made a part hereof and on which similar letters of reference indicate similar parts, Figure 1 is a side elevation of a bicycle equipped with our invention; Fig. 2, a transverse sectional view of the hub of the bicycle, showing a pump therein, with the lower end of the tube connected to its discharge-orifice; Fig. 3, a similar view with the tube disengaged from the pump; Fig. 4, a longitudinal sectional view of the hub; Fig. 5, a sectional view of the valve to the wheel-tire with a fragment of the tube in connection therewith, showing the position occupied by said tube at its upper end when the lower end is in the position shown in Fig. 2; Fig. 6, a similar view, but showing the position of the tube at the upper end when the lower end is in the position shown in Fig. 3; and Fig. 7, a detail view, on an enlarged scale, showing the construction of the cut-off valve.

In said drawings the portions marked A represent the shell of the wheel-hub; B, the axle; C, the rotary pump-piston thereon; D, the pump-cylinder, and E the tube extending from the pump to the tire.

The wheel-hub as a wheel-hub is or may be of any usual or desired construction, so that the central portion is sufficiently open to receive the small rotary pump. The shaft B is

stationary, as is usual, and carries the pump-piston. The pump-cylinder, C surrounds the piston and will usually have no motion independent thereof, so that when said cylinder is disengaged from the wheel-hub shell the pump has no operative action. The cylinder D has an ingress-opening  $d'$  and an egress-opening  $d''$ . Alongside the egress-opening is a projection  $d$ , and a suitable packing  $p$  should surround said opening and form a seat for the lower end of the tube E when the latter is in contact therewith, as best shown in Fig. 2.

The tube E is screw-threaded at the lower end and mounted in a screw-threaded opening in the wheel-hub shell A. Its outer end engages with the tire-valve  $v$ , attached to the tire T. Normally when the pump is not in use this tube is moved (preferably by means of the screw-threaded construction shown) so that it occupies the position shown in Fig. 3, free from the pump, in which case its operation on the tire-valve  $v$  is also freed and said valve is closed. When, however, it is desired to inflate the tire, this tube E is revolved and its lower end driven down, by means of the screw-thread thereon, into the path of the projection  $d$ . This is so arranged as to engage the pump-cylinder at exactly the proper point, so that the continued movement of the tube inwardly seats its lower end firmly on the packing surrounding the egress-opening in said pump-cylinder. By this time the tire-valve  $v$  has been opened, so that there is a free passage from the pump to the tire. Obviously now upon the further revolution of the wheel the pump-cylinder is revolved around the pump-piston and the pump caused to operate, drawing in air at its ingress-opening  $d'$  and driving it out at its egress-opening  $d''$  and forcing it through the tube E into the tire. When a sufficient amount of air has been pumped, a slight movement of the tube E in the reverse direction uncouples the connection of the pump and closes the tire-valve, when the pump is idle, as before, the valve  $v$  being at the same time closed or permitted to close, as before explained; so that the air is retained within the tire.

The valves connected to the wheel-tires are, generally speaking, of any usual or desired form. In such a valve the valve proper,  $v$ , rests upon an appropriate seat, being nor-

mally held against the same by a spring *s*. The force of the air raises the valve and passes on by it into the tire, and said valve seats itself when the pressure from the outside is relieved or is less than the pressure inside the tire, all as will be readily understood. Below this valve, however, we have provided a second valve *w*, which is in the form of a fixed plate in the valve-tube, having perforations near the sides and a conical center against which the end of the tube *E* may press when said tube is in the positions shown in Figs. 3, 6, and 7. When so seated, said parts effectually cut off the flow of air and take the place of the ordinary cap to the valve.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a vehicle-wheel, of the wheel-hub, a rotary pump constructed within said wheel-hub, a bicycle-tire, and a tube extending from said hub to said tire, said tube being adjustable longitudinally and said pump being provided with a projection into the path of which the adjustable tube is adapted to be projected, said projection being properly located relatively to the egress-

opening of the pump so that further adjustment accomplishes a contact between said tube and said egress-opening.

2. The combination, in a vehicle, of a non-rotary wheel-shaft, a pump-piston mounted thereon, a pump-cylinder surrounding said piston and provided with ingress and egress openings for the air and a detent projection alongside the egress-opening, and a tube extending between the wheel-hub shell and the wheel-rim and adjustable radially of the wheel, its inner end being adapted to be adjusted into the path of the projection alongside the egress-opening in the pump-cylinder and to make a contact with said egress-opening, the adjustment at the same time causing the opening of the tire-valve at the other end of the tube, substantially as set forth.

In witness whereof we have hereunto set our hands and seals, at Connorsville, Indiana, this 1st day of June, A. D. 1897.

ANTHONY KEHL. [L. S.]  
FRANK E. KEHL. [L. S.]

Witnesses:

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CHARLES F. VANCE.