

(No Model.)

J. HARDMAN, Jr.
BICYCLE TIRE VALVE.

No. 558,606.

Patented Apr. 21, 1896.

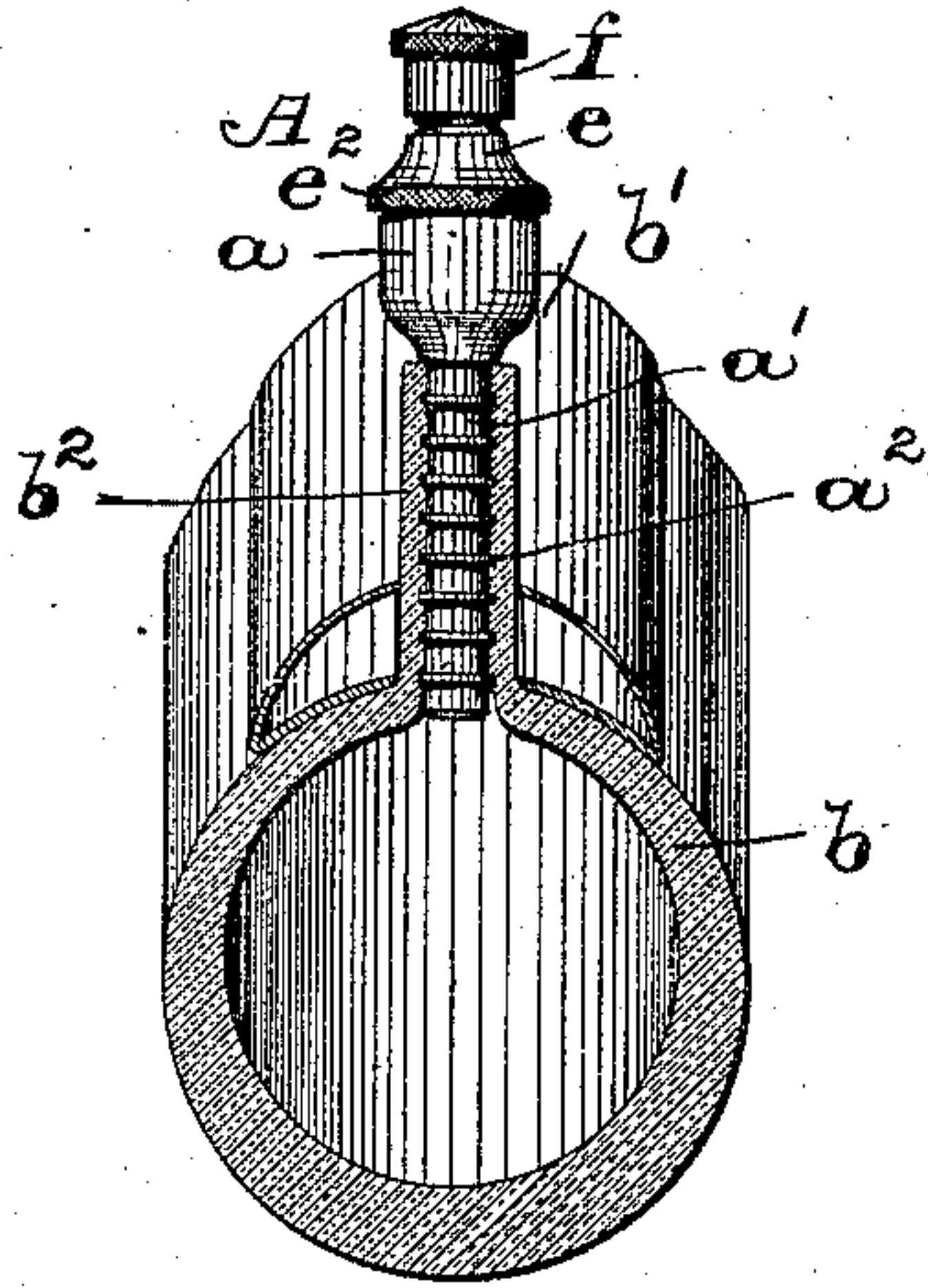


FIG. 1

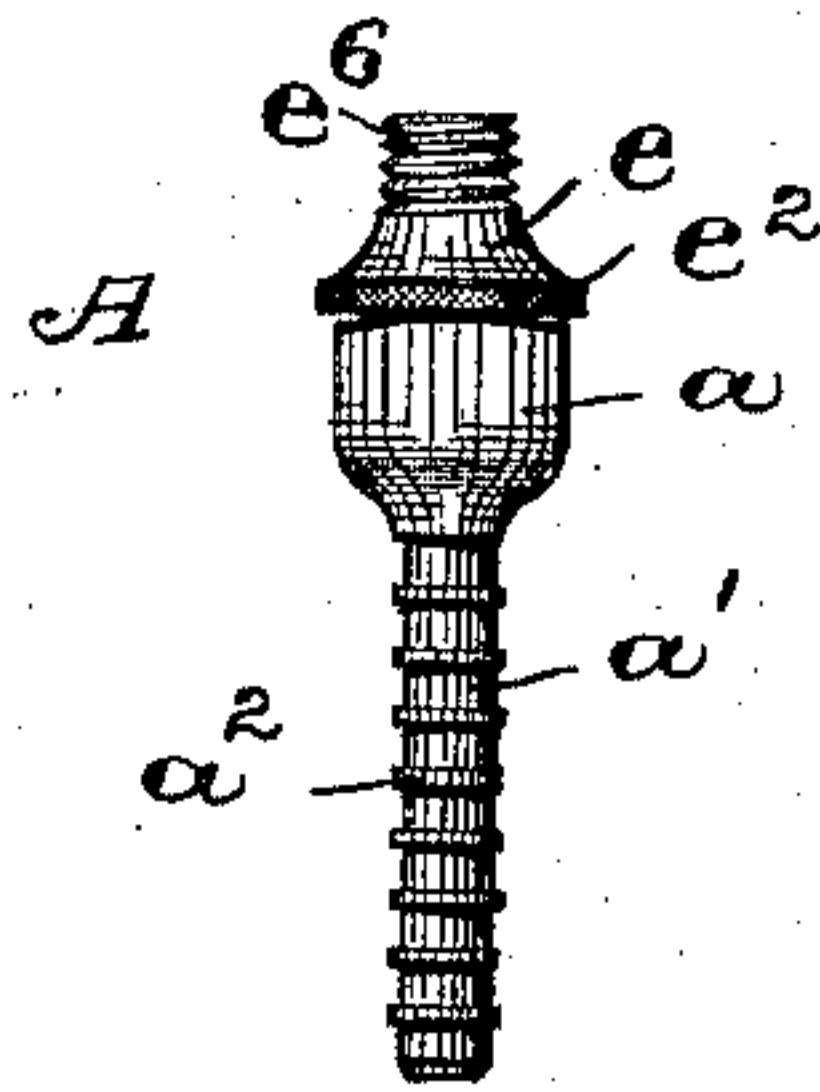


FIG. 2

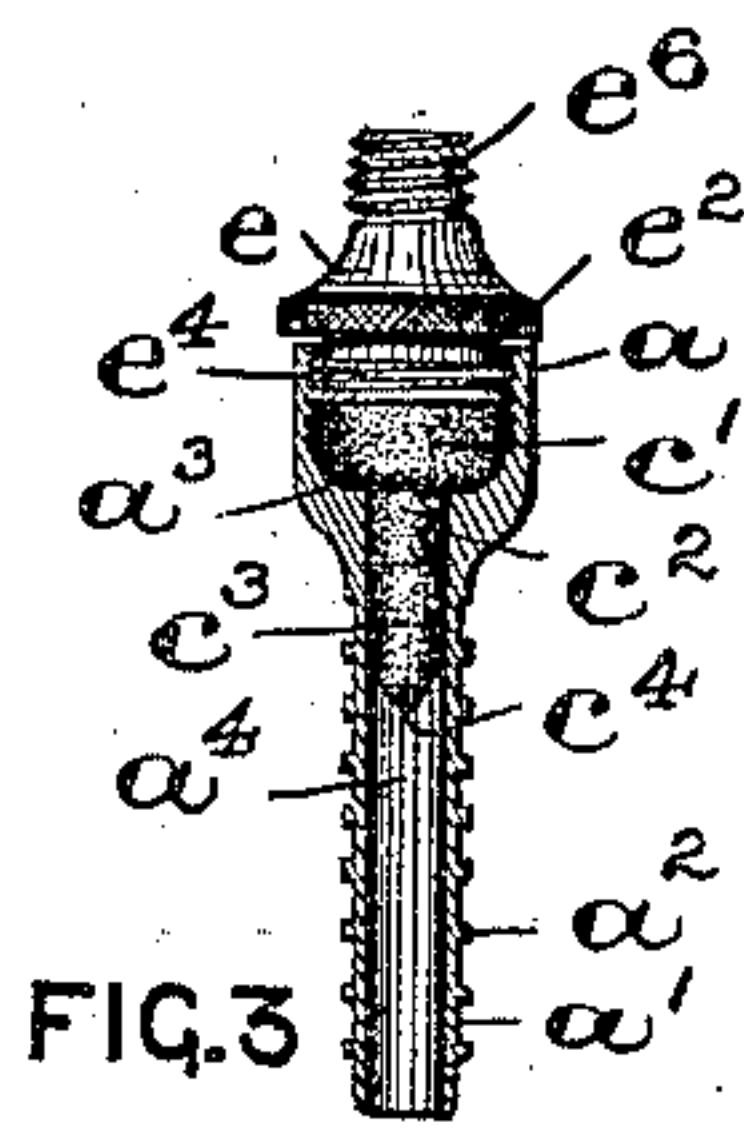


FIG. 3

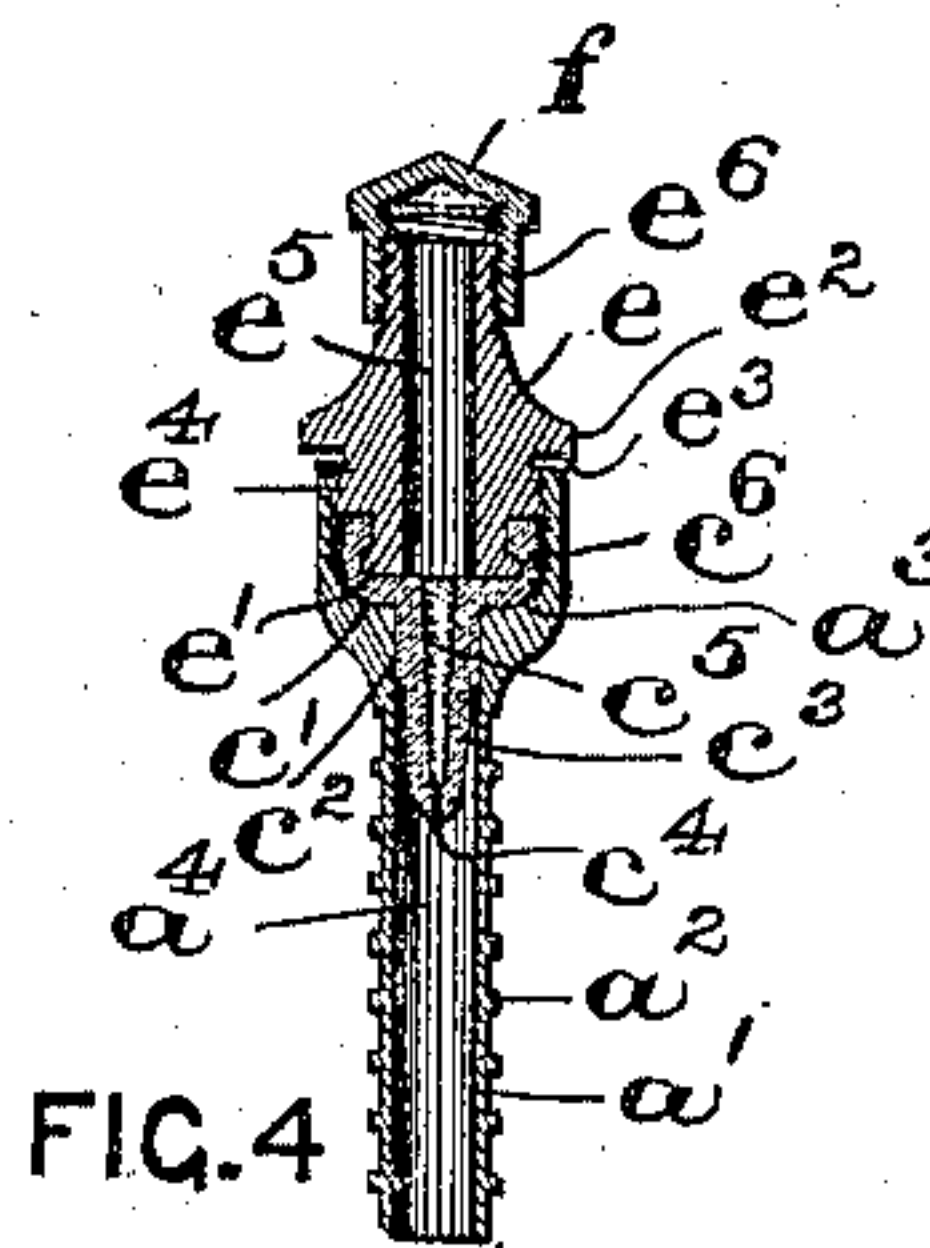


FIG. 4

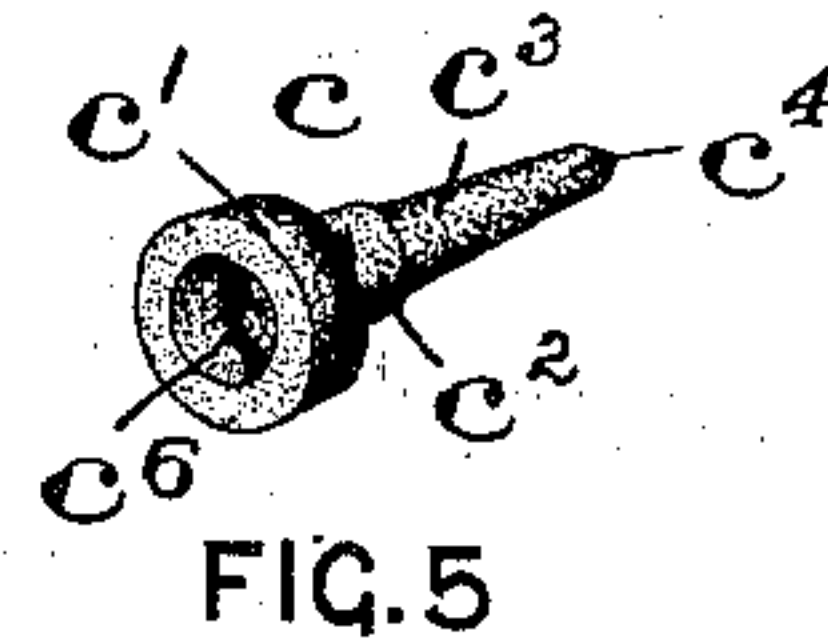


FIG. 5

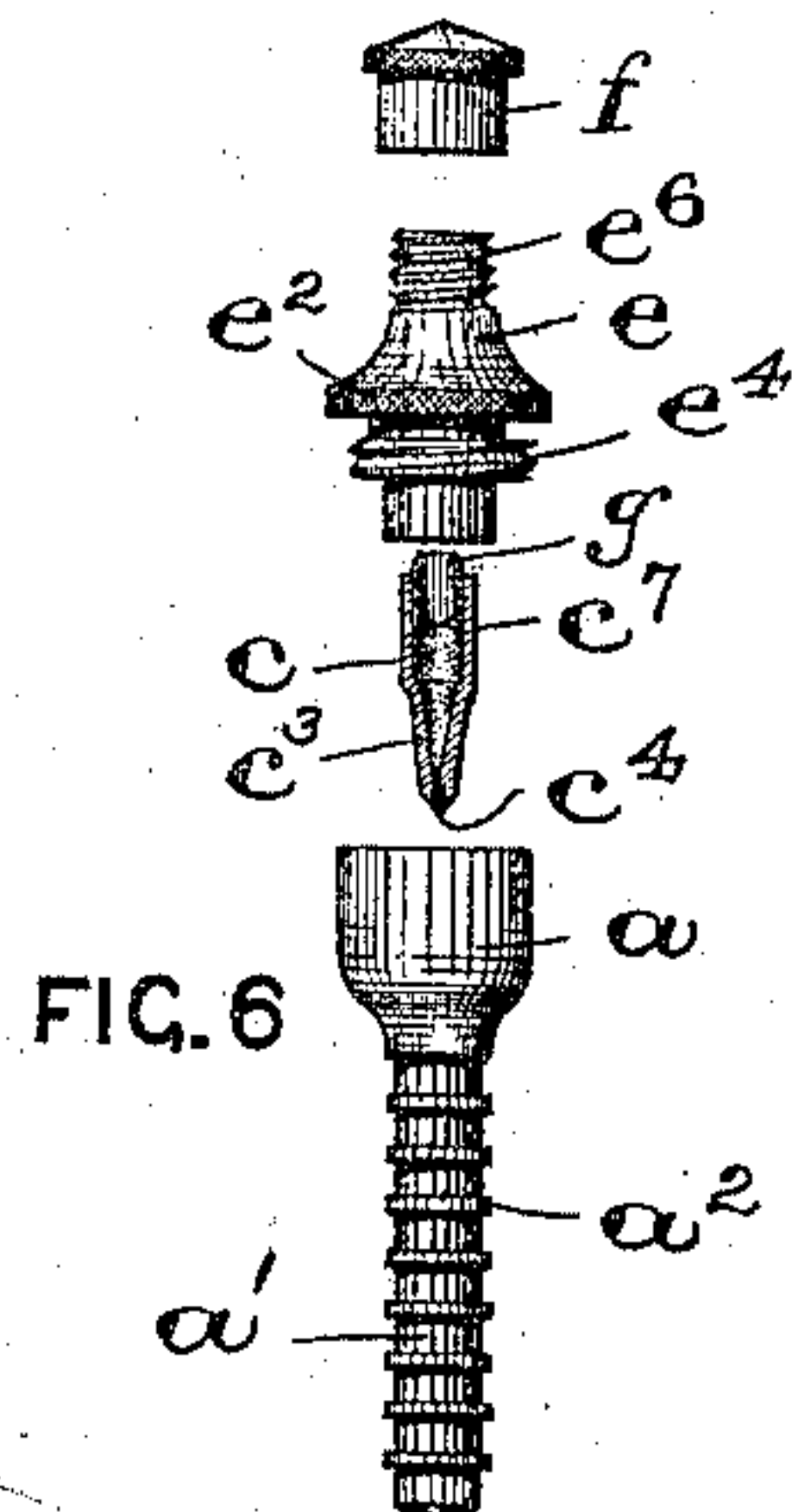


FIG. 6

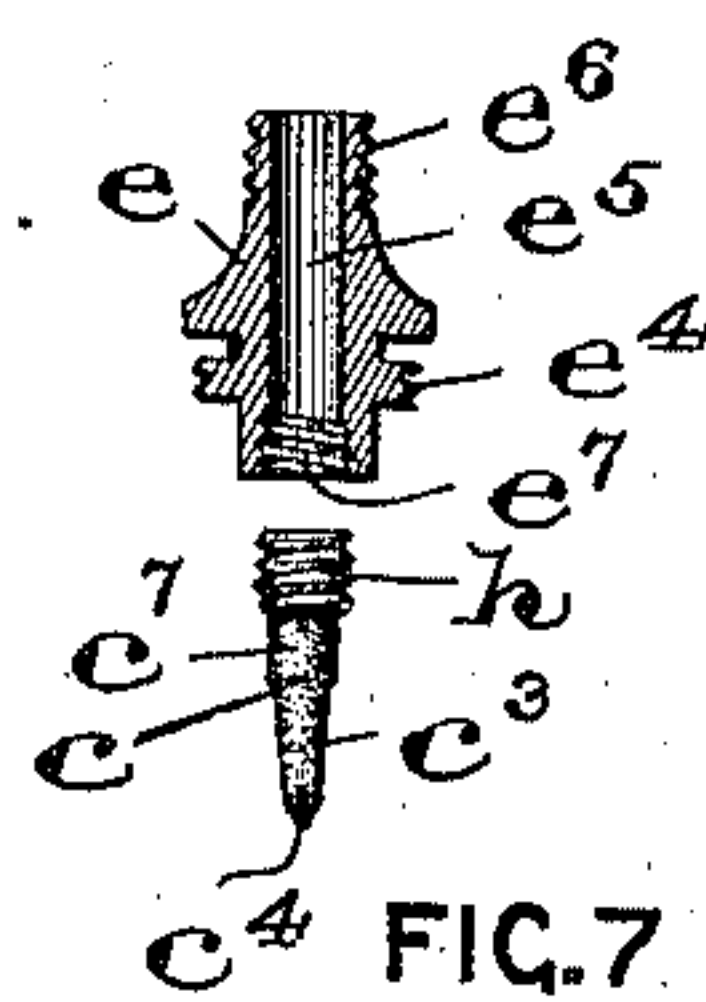


FIG. 7

WITNESSES:

Wm. H. Campfield, Jr.
Walter G. E. Ward

INVENTOR:

JAMES HARDMAN, JR.

BY

Fred C. Fraentzel,
ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES HARDMAN, JR., OF BELLEVILLE, NEW JERSEY.

BICYCLE-TIRE VALVE.

SPECIFICATION forming part of Letters Patent No. 558,606, dated April 21, 1896.

Application filed June 15, 1895. Serial No. 552,884. (No model.)

To all whom it may concern:

Be it known that I, JAMES HARDMAN, Jr., a citizen of the United States, residing at Belleville, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Bicycle-Tire Valves; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has reference to a novel form of bicycle-tire valve, and has for its object to provide a valve for the purpose stated, which shall be simple in its construction, which can be readily operated to inflate the tire by means of the usual forms of force-pumps, in which there will be no leakage due to the back air, which causes the tire to be instantly deflated when the parts of the valve-casing are separated, in which the valve itself can be replaced at a small cost or can be instantly repaired, and which shall be dust-proof.

The invention therefore consists in the novel construction of bicycle-tire valve herein described, and also in the novel arrangements and combinations of parts comprising the general construction of valve to be hereinafter fully described, and finally embodied in the clauses of the claim.

The invention is illustrated in the accompanying sheet of drawings, in which—

Figure 1 is a sectional view of part of a bicycle-rim and its tire, illustrating one arrangement of applying my novel form of valve thereto. Fig. 2 is a side elevation of the complete valve-casing with the dust-cap employed in connection therewith removed from that part of the valve-casing forming the seat for the flexible valve. Fig. 3 is a view of the valve-casing, illustrating the upper part thereof in elevation, and the separable shank to be attached to the bicycle-tire being represented in vertical section. Fig. 4 is a vertical section of the valve-casing and its flexible valve, and Fig. 5 is a perspective view of the flexible valve employed in connection with this invention. Fig. 6 is a view of the several parts of the valve construction of a slightly-

modified form of construction, and Fig. 7 is a detail view of certain parts of a valve of still another modified form of construction.

Similar letters of reference are employed in each of the above-described views to indicate corresponding parts.

Referring to said drawings, *b* indicates the ordinary rubber tire of a bicycle or other like vehicle, and *b'* is the rim of the wheel.

A indicates my novel form of valve for bicycle-tires; and it consists essentially of a cup-shaped body portion *a*, having a tubular shank *a'*, provided with any suitable means, such as projections or rings *a²*, raised on the outer cylindrical surface of the shank to hold the latter in the tube *b²* of the tire *b* for inflating or deflating the same. Within said cup-shaped portion *a*, and upon a suitable valve-seat *a³* therein, rests the flexible valve *c*, which is preferably made of rubber and is conical in form, as shown in Fig. 5, having the enlarged upper portion *c'*, which is of a shape corresponding to that of the said seat *a³*, and upon which it is snugly fitted, as clearly indicated in Figs. 3 and 4. A portion *c²* of said valve *c* is made perfectly cylindrical, being of the same or of a slightly larger diameter than the diameter of the bore *a⁴* in the shank *a'*, whereby said valve can be snugly, but still removably, fitted in said tubular shank. From the said cylindrical portion *c²* extends a conical part *c³* of the valve, the same being slitted at its free end, as at *c⁴*, and said slit extending into the tubular opening *c⁵* of said flexible valve, as shown. Said flexible valve *c* is provided in its upper and enlarged portion *c'* with an inner and annular recess *c⁶*, (see Figs. 4 and 5,) by means of which it can be securely fitted upon an annular shoulder or rib *e'* on the upper tubular portion *e* of the valve-casing, as will be seen from an inspection of the drawings. Said upper portion *e* is provided with a knurled portion *e²*, forming a shoulder *e³*, from which depends the screw-threaded part *e⁴*, adapted to be screwed into the cup-shaped portion *a* of the valve-casing, thereby bringing the flexible valve *c* in position on its seat *a³* and the parts *c²* and *c³* of the same into their operative positions in the bore of the shank *a'*, as clearly illustrated in Figs. 3 and 4.

The bore *e⁵* of the part *e* is in direct com-

munication with the tubular opening c^5 of the flexible valve c , and on the screw-threaded end e^6 of said part e I have screwed an ordinary dust-cap f , to prevent the dirt and dust from getting into the valve-casing and destroying the utility of the flexible valve c . As will be clearly understood, and as will be evident from an inspection of the drawings, said cylindrical portion c^2 of the valve, which fits snugly in the bore a^4 of the shank a' , acts like an ordinary stopper in the neck of the bottle, preventing the escape of any air from the inflated tire, due to back pressure, and at the same time dispensing with the ordinary washer now used in bicycle-tire valves to prevent leakage.

The operation of the valve, when secured in position on the bicycle-tire, is as follows: To inflate the tire, the dust-cap f is unscrewed and an ordinary force-pump secured on the screw-threaded end e^6 of the upper portion e of the valve-casing. As will be clearly understood, the pump forces the air through the tubular portion or opening e^5 and into the tube-like part of the flexible valve c , and finally through the slit in the end thereof into the bicycle-tire, which it inflates. When the pump is removed, the back air, or rather the back pressure, will cause the slit c^4 to be firmly closed, and, owing to the snug fit of the cylindrical part c^2 in the tubular part of the shank a' and the tightly-fitting portion c' of the valve c on the valve-seat a^3 , there can be no leakage due to such back pressure. Thus it will be seen that when the valve is being used to inflate the tire it opens and closes automatically, as the jaws formed by said slit in the end of the valve c are forced open by the inwardly-passing air or are closed by the back pressure of the air in the tire.

One of the greatest advantages in my present form of bicycle-tire valve is that when I unscrew the part e from the main portion a of the valve-casing the flexible valve c is entirely withdrawn from within the tubular shank a' , thereby permitting the air to escape very rapidly and the tire is instantly deflated. Another great advantage is that in case the flexible valve portion c should become hardened and inoperative the parts of the valve-casing can be quickly unscrewed and the flexible valve replaced by another, which permits of the instant repairing of the valve at a very slight cost, while in those constructions now in use the parts of the valve-casing have to be removed from the tire and rim of the wheel and replaced by a new and complete valve-casing and valve therein. In my construction all that has to be replaced is the conical valve c , which can be furnished at a trifling cost.

In Fig. 6 I have shown a different means of a slightly-modified construction for attaching the flexible valve portion c to the upper part e of the valve-casing. In this case the annular projection or rib e' is dispensed with, and the valve c is simply made cylindrical,

as at c^7 , being provided with a small eyelet g , and these parts are forced into the lower end of the opening e^5 of the upper portion e and securely held therein by friction, as will be clearly understood. Another way of securing the flexible valve portion c to said upper portion e is illustrated in Fig. 7, in which case the lower end of said tubular opening e^5 is made screw-threaded, as at e^7 , and the cylindrical part c^7 of the valve c has secured thereto a metallic collar h , which is provided with a suitable screw-thread, substantially as shown, in order that the flexible valve can be attached to the upper part e of the valve-casing. Of course it will be evident that other changes may be made in the arrangements and combinations of the several parts comprising the valve construction, and hence I do not limit my invention to the exact arrangement and combinations of the parts as herein shown.

My novel form of valve is also applicable to other uses, such as a syringe or atomizer valve, in which case the dust-cap f is dispensed with, the parts of the syringe or atomizer being attached directly to the separable portions a and e of the valve-casing in any well-known manner, as will be clearly understood. It will therefore be seen that I have devised a simple and operative valve, designed more especially for use in connection with the tire of a bicycle or other vehicle, for inflating the same and quickly deflating the tire when required, the parts of the valve being readily replaced and repaired at a very small cost, and a valve is furthermore obtained which can be put to many other uses.

Having thus described my invention, what I claim is—

1. A bicycle-tire valve, comprising therein, a valve-casing, having a lower portion provided with a valve-seat and a tubular shank, and an upper portion, separable from said lower portion, a flexible-valve portion attached to said upper portion, having a cone-shaped end extending into said tubular shank, and said end of the valve being slitted, and said valve having a cylindrical portion c^2 , which fits snugly in said tubular shank and acts like a stopper, substantially as and for the purposes set forth.

2. A bicycle-tire valve, comprising therein, a valve-casing, having a lower portion provided with a valve-seat and a tubular shank, and an upper portion, separable from said lower portion, a flexible-valve portion detachably connected with said upper portion of the valve-casing, consisting of a cone of flexible material having a slitted end, and said valve having a cylindrical portion c^2 , which fits snugly in said tubular shank and acts like a stopper, substantially as and for the purposes set forth.

3. A bicycle-tire valve, comprising therein, a valve-casing, having a lower portion provided with a valve-seat and a tubular shank, and an upper portion, separable from said lower portion, a flexible-valve portion detach-

ably connected with said upper portion of the valve-casing, having an enlarged portion adapted to fit on said seat in the upper portion of the valve-casing, a cylindrical part c^2 adapted to fit the bore in the lower portion of the valve-casing, and a cone-shaped end c^3 having a slit c^4 , substantially as and for the purposes set forth.

4. The herein-described valve, comprising
10 therein, a valve-casing, having a lower portion a provided with a valve-seat a^3 and a tubular shank a' , and an upper portion e screwed into said lower portion a , a tubular opening e^5 in said portion e , and a flexible-
15 valve portion attached to said portion e , consisting of a cone of flexible material having a slitted end, and said valve having a cylindrical portion c^2 , which fits snugly in said tubular shank and acts like a stopper, substantially as and for the purposes set forth.

5. The herein-described valve, comprising

therein, a valve-casing, having a lower portion a provided with a valve-seat a^3 and a tubular shank a' , and an upper portion e screwed into said lower portion a , a tubular opening e^5 and a rib or projection e' connected with said portion e , a flexible-valve portion c , having an enlarged portion c' and an inner annular recess c^6 adapted to be forced over said rib e' , and a conical end portion c^3 having a slit c^4 , and said valve having a cylindrical portion c^2 , which fits snugly in said tubular shank and acts like a stopper, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 14th day of June, 1895.

JAMES HARDMAN, JR.

Witnesses:

FREDK. C. FRAENTZEL,
WM. H. CAMFIELD, Jr.