(No Model.)

G. H. F. SCHRADER.

TIRE VALVE.

No. 591,012. Patented Oct. 5, 1897.

FIG. 1.

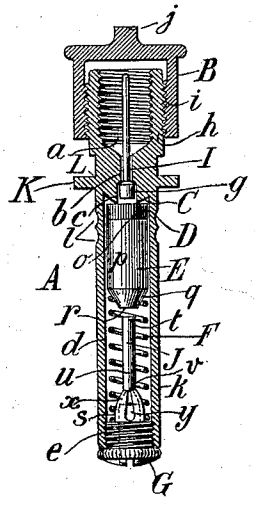


FIG. 2.

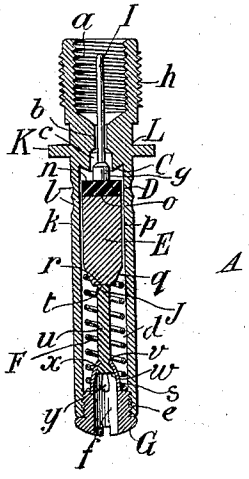


FIG. 4.

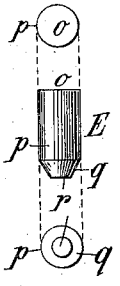
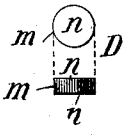


FIG. 3.



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TIRE-VALVE.

SPECIFICATION forming part of Letters Patent No. 591,012, dated October 5, 1897.

Application filed June 4, 1896. Serial No. 594,264. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. F. SCHRADER, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Tire-Valves, of which the following is a specification.

This invention relates to pneumatic valves of the kind used for bicycle-tires and aims to provide certain features of improvement in such devices.

In carrying out the preferred form of my present improvement I provide a loose flat disk for the valve proper entirely free from and disconnected from other parts, so that it can be readily replaced when renewal is necessary, and I provide means preventing the inward forcing of the movable parts of the valve to such extent as to endanger impairment thereof or of the spring or the jamming of the latter into inoperative position, and I provide an improved external construction of the valve-body and certain features of improvement, all of which will be more fully hereinafter set forth.

In the accompanying drawings, which show the preferred form of my present improvement, Figure 1 is an axial section of a tire-valve casing, cap, and spring, showing the deflater, valve, plunger, and inner plug in elevation and in the closed position. Fig. 2 is an axial section of the casing, valve, and plunger and of the inner plug, showing the deflater in elevation and the parts in the open position. Fig. 3 is a top and edge view of the valve proper; and Fig. 4 is a top, side, and bottom view of the plunger.

Referring to the drawings, let A indicate the casing, B the cap, C the valve-seat, D the valve proper or disk, E the plunger, F the spring, G the inner plug, and I the deflater, of a tire-valve. In the general features these parts are of usual construction and any other character of analogous devices may be substituted for them without departing from or materially affecting my present improvement. The casing A is tubular, being traversed by a conduit having an outer internally-screw-threaded socket *a*, communicating with a contracted neck *b*, having an enlargement *c* opening through the seat C, from whence the valve-chamber *d* extends as a cylindrical socket inwardly, terminating at the end of the casing in a female screw-thread *e*, into which is screwed the plug G for closing the inner end of the chamber. This plug has the usual tubular interior or duct *f*, affording communication through it. The valve-seat C is an annular tapering seat, the valve proper, D, a suitable packing material engaging this seat, the plunger E a suitable member for manipulating the valve proper, and the spring F is the ordinary spiral spring reacting against the plunger and plug to hold the valve proper toward the seat. The deflater I is a loose pin having a large head *g* within the socket *c*, preventing escape of the deflater outwardly and acting against the valve proper when the deflater is forced in to unseat the valve. The casing has an external screw-thread *h*, receiving the internal thread *i* of the cap when the latter is screwed on the casing. The cap has a deflating projection *j*, which may be pressed against the end of the deflater to operate it. The casing has a cylindrical exterior *k* along its inner end, provided with grooves *l* at suitable points.

As thus far described the parts are of well-known construction. I will now describe in their preferred form the several details of improvement incident to my present invention.

The valve proper, D, is constructed according to my present improvement as a flat loose disk having cylindrical side walls *m* and flat top and bottom faces *n*. It is solid and imperforate, best constructed of rubber, and is of a diameter nearly but not quite as great as the internal diameter of the valve-chamber and of a thickness sufficient to preserve its general shape under ordinary usage. This disk is confined in the space between the annular seat C and the flat top face *o* of the plunger E, between the walls of the valve-chamber, but is free to move laterally to the extent of the difference between its diameter and the diameter of such chamber, so that it may seat at slightly-different points in use.

The plunger E is a loose imperforate cylinder or block having the flat top *o*, acting against the disk, cylindrical side walls *p*, loosely fitting within the chamber, a reduced or other suitable spring bearing portion *q*, and an end or face *r* at its inner end. The

side walls fit the chamber with sufficient closeness to properly guide the plunger, but with sufficient freedom to permit the necessary flow past them for ingress and egress through the valve. The top face serves to hold the disk against the seat and protect it against deflection or unusual or uneven pressure. The bearing-face *q* is preferably conical, fitting within the spring, receiving the reaction thereof, and guiding the upper end of the spring so that the latter shall be maintained concentric with the valve-chamber. The lower end of the spring is best guided by a reduced or tapering portion *s* on or projecting from the screw-plug G, about which the spring passes, so that it is confined in position axially at both ends.

In practice it is sometimes found that in charging tires the inrushing air is at such pressure that it drives the plunger and spring inward so forcibly as to buckle the latter or wedge the parts in position or so compresses the spring as to destroy its requisite elasticity, thereby impairing the operativeness of the valve. One feature of my present improvements aims to prevent such impairment, and to this end I provide a stop J for limiting the inward movement of the plunger and valve. This stop is preferably carried by the screw-plug G, being extended up within the spring and terminating in an active end *t*, disposed at the proper point to strike the face *r* of the plunger and arrest further inward movement of the plunger. The stop J is shown as consisting of a short cylindrical rod *u*, having a shoulder *v* and a tapering end *w*, against which the bifurcated ends *x* of the part *s* of the screw-plug are bent to hold the rod in place. This is a simple expedient for accomplishing this end, and, if preferred, any other construction for producing a stop between the plunger and screw-plug, projecting from either into abutting contact with the other, may be substituted, it simply being necessary to extend the one to the point where it should arrest the other. The screw-plug shown is provided with aperture *y*, communicating between its duct *f* and the valve-chamber.

Another feature of improvement relates to the external construction of the casing A and consists in providing the thin annular flange K at the outer end of the cylindrical part *k* of the casing, between the latter and the cap end of the valve, and a deep annular groove L immediately above this flange and of less diameter than the threaded head *h* of the casing. The flange K substantially equals the maximum diameter of the cap B, and its inner face serves as a wide shoulder embracing the end face of the cot or tube into which the body *k* is inserted when applying the valve. The groove L reduces the casing to a diameter opposite the neck *b* which is substantially equal to the body *k*, so that between the cap and flange there is a recess providing abundant room for the screwing home of the cap and assuring against the grasping of the flange simultaneously with the grasping of the cap by the same fingers used for unscrewing the latter, while the periphery of the flange serves as a grasping portion on the casing by which the latter can be held with one hand while the cap is screwed on or off with the other hand.

When the loose thin washer D is used with the stop J, the parts are best adjusted so that the opening movement shall not exceed the thickness of the washer, thus precluding the possibility of movement of the latter to an edgewise position between the valve-seat and adjacent face of the plunger. In use the washer D will shift slightly to different positions with each seating of the valve, thus insuring a new contacting face at each time and prolonging the life of the washer. When it is necessary to renew the washer, its looseness readily permits its removal, whereupon a new washer can be placed in the chamber, the plunger, spring, and screw-plug inserted in position, and the valve will be again ready for use. The spring will be preserved against impairment by the stop J, the washer will by the same means be prevented from displacement, and the washer and plunger will be guided by the walls of the valve-chamber.

It will be seen that my invention provides improvements which can be readily and advantageously availed of, and it will be understood that the invention is not limited to the particular details of construction, combination, and use set forth as constituting its preferred form.

What I claim is—

1. In tire-valves, a casing having a valve-chamber and an annular seat at the end thereof, in combination with a thin washer of packing material constituting a valve proper, within said chamber, engaging said seat and disconnected from the other parts of the valve, and a plunger bearing against said washer, holding it toward said seat and disconnected from said washer.

2. In tire-valves, a casing having a valve chamber and seat, in combination with a valve proper therein, and a stop between said casing and valve proper limiting the opening movement of the latter to prevent impairment of the valve, consisting of an exposed unconfined solid projection on the one and an exposed unconfined surface on the other opposite and abutting against said projection.

3. In tire-valves, a casing having a valve-seat and valve-chamber, and a valve proper opposite said seat, in combination with a spring compressed by the opening movement of the valve proper, and a stop within said chamber engaging the valve proper and limiting compression of said spring, consisting of an exposed rigid projection carried by the casing within said spring, and an exposed unconfined surface on the valve proper opposite and abutting against said projection.

4. In tire-valves, a casing having a valve-

seat, and a valve-chamber, in combination with a tubular plug G closing the inner end of said chamber, a rigid exposed stop J projecting therein and carried by said plug, a valve D and plunger E within said chamber between said seat and stop, said plunger having an exposed unconfined surface opposite and abutting freely against said stop, and a spring F within said chamber surrounding said stop and reacting against said plug and plunger to seat the valve.

5. In tire-valves, a casing A, having an outer socket *a*, neck *b*, annular valve-seat C and valve-chamber *d*, in combination with a screw-plug G closing the inner end of said chamber, a loose disk D engaging said seat, a loose plunger E holding said disk toward the seat, a spring F between said plunger and plug, and a deflater I traversing said neck for unseating said valve.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE H. F. SCHRADER.

Witnesses:
GEORGE H. FRASER,
THOMAS F. WALLACE.