No. 610,253. Patented Sept. 6, 1898.

F. M. BELL.

VALVE.

(Application filed Sept. 21, 1897.)

(No Model.)

Fig. 1.

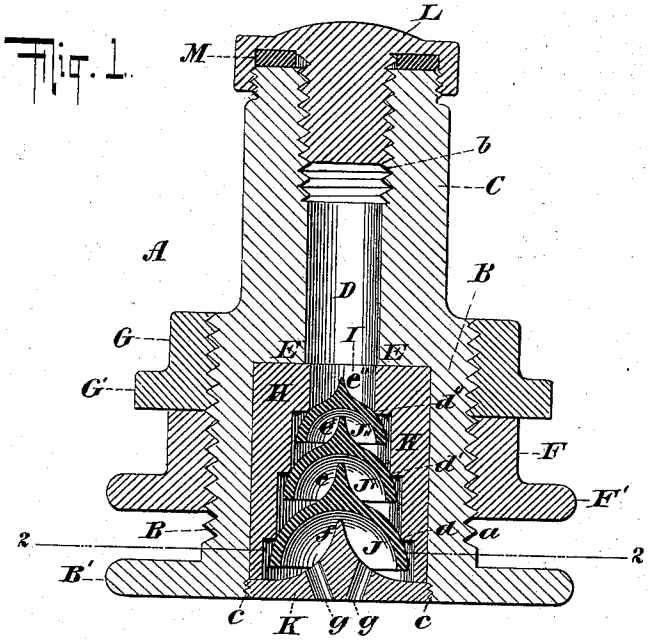


Fig. 2.

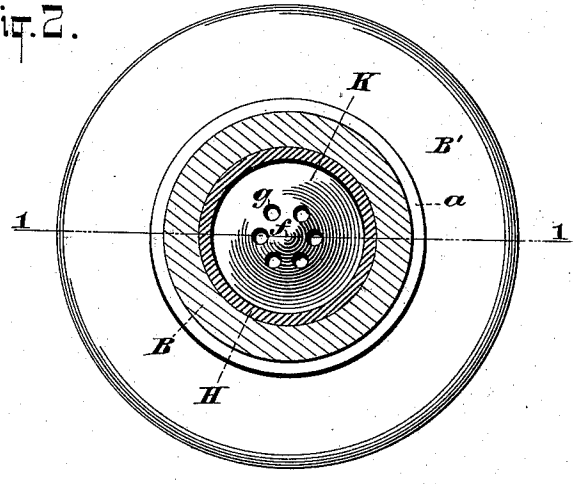
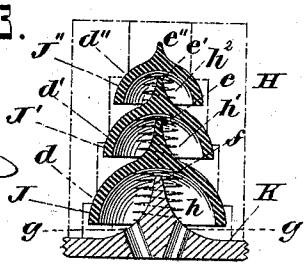


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANK M. BELL, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO WILLMA POLLACK, OF SAME PLACE.

VALVE.

SPECIFICATION forming part of Letters Patent No. 610,253, dated September 6, 1898.

Application filed September 21, 1897. Serial No. 652,426. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. BELL, a citizen of the United States, residing at the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Valves, of which the following is a full, clear, and exact specification.

My invention relates to improvements in apparatus for automatically controlling the ingress and egress of air, gas, and other fluids to and from a container and confining the same securely therein; and the said invention has for its object more particularly to provide a simple, compact, efficient, and inexpensive valve for bicycle-tires or other containers and for apparatus adapted for use in compressing fluids within or exhausting the same from containers of divers characters.

These objects above set forth I am enabled to accomplish by means of my invention, which consists in the novel details of construction and in the combination, connection, and arrangement of parts, as hereinafter more fully described, and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, wherein like letters of reference indicate like parts, Figure 1 is a central section, greatly enlarged, showing a bicycle-tire valve constructed according to and embodying my invention. Fig. 2 is a section thereof taken on the line 2 2 of Fig. 1, and Fig. 3 is a detail section illustrating a modification.

In said drawings, A designates the valve, comprising an outer metal casing B, provided at its base with a laterally-projecting flange B′ and at its top with a stem C.

D denotes a centrally-arranged aperture extending through the casing B, and in reduced diameter through the stem C, so as to form the shoulder E upon the inner surface of the casing B, at its top. Upon the outer surface of the casing B are provided screw-threads *a*, and upon the inner surface of the aperture D at the mouth of the stem C are provided screw-threads *b*, and at the base of the casing B are provided screw-threads *c*.

F denotes an internally-threaded sleeve working upon the outside of the casing B and provided with a laterally-projecting flange F′, corresponding in outline substantially with the flange B′ of the casing B, between which flanges F′ B′ the tire is adapted to be clamped, and G denotes a binding-nut provided with a short laterally-projecting flange or rim G′, adapted to work upon the outside of the casing B to hold the sleeve F locked to its adjusted position.

Within the outside casing B is disposed a secondary casing H, which by preference is made of soft vulcanized rubber and provided with a terraced aperture I, extending entirely through the same and forming the valve-seats *d d′ d″*. Within this soft-rubber casing H is arranged a series of graduated, semi-spherical, independently-operating valves J J′ J″, made, by preference, of hard vulcanized rubber and provided upon their upper or convex surfaces with centrally-located teats *e e′ e″*, respectively, whereby said valves J J′ J″ are maintained properly separated to form an air-passage when not held pressed against their respective seats, and K denotes a disk or head provided upon its periphery with screw-threads and adapted to be secured to the casing B at its base to maintain the secondary rubber casing H and the valves J J′ J″ therein duly in position within the outer casing B, and said disk or head K is further provided upon its upper surface with a teat *f*, corresponding in form with those on the valves, and a series of concentrically-arranged air-ports *g*, through which the air or fluid may pass to and from the container.

L denotes a screw-plug provided with a suitable washer or gasket M, whereby to seal the mouth of the stem C.

In Fig. 3 I have shown a modification, and in this figure the valves J J′ J″ are maintained separated from each other and the head K by means of coil-springs *h h′ h²*, disposed upon the teats *f*, *e*, and *e′*, to hold the valves normally in contact with their respective seats, where this may for any reason become desirable or necessary.

The operation is as follows: When a tire is to be inflated, the plug L is first removed and the nozzle of the inflating apparatus attached thereto and air then forced into the tire. As soon as the desired amount has been forced into the tire the nozzle of the inflating appa-

ratus is detached, and thereupon the air will rush back through the ports *g* in the head K and strike the concave surface of the valve J and press the same firmly against its seat and thereby arrest the passage of the air. However, should, through any cause, air succeed in passing the first valve J the next valve above will become operative, and so on. It will be observed that each of the valves is adapted to operate independently, and while I have shown the valve constructed with three valve-faces any desired number may be employed.

Without limiting myself to the details of construction, which may be varied within the scope of the invention, what I claim, and desire to secure by Letters Patent, is—

1. In an automatic valve the combination of an outer casing with an inner casing and valves adapted to be seated by pressure within said inner resilient casing, substantially as specified.

2. In an automatic valve, the combination of an outer substantially non-resilient casing with an inner resilient casing having seats arranged therein and a plurality of substantially non-resilient concavo-convex valves arranged within said inner resilient casing, substantially as specified.

3. In an automatic valve, the combination of an outer casing with an inner resilient casing having seats arranged therein and a plurality of superposed, concavo-convex valves arranged within said inner resilient casing, substantially as specified.

4. In an automatic valve, the combination of an outer casing with an inner resilient casing having seats arranged therein, a plurality of valves arranged therein, and means for maintaining said valves separated from each other within said resilient casing, substantially as specified.

5. In an automatic valve, the combination of an outer casing with an inner resilient casing having a terraced aperture therein forming seats, a series of graduated concavo-convex valves arranged therein, and means for maintaining said valves duly separated within the resilient casing, and the resilient casing in position within the outer casing, substantially as specified.

6. In an automatic valve, the combination of an outer casing having a hollow stem, and means for sealing the nozzle thereof, with an inner, resilient casing having an aperture therein provided with valve-seats, a plurality of concavo-convex valves arranged within said inner resilient casing, a foraminated head secured within the casing at its base to hold the inner, resilient casing and valves arranged therein in position within said outer casing, means for maintaining said valves separated from each other and the foraminated head, and means for securing the valve to a container, substantially as specified.

7. In an automatic valve, the combination of an outer casing having a hollow stem extending therefrom and provided with a plug for sealing the nozzle thereof, with an inner, resilient casing having a terraced aperture therein forming valve-seats, a series of graduated, substantially non-resilient concavo-convex valves arranged within said resilient casing, a foraminated head secured within the outer casing at its base, means for maintaining said concavo-convex valves separated from each other, and the lowermost valve from the foraminated head, and means for securing the valve to a container, substantially as specified.

8. In an automatic valve, the combination with an outer casing having screw-threads arranged upon its outer surface, a stem extending from the top thereof, and a lateral flange projecting from the base thereof, an aperture extending through said outer casing and stem, a screw-plug adapted to seal said aperture at the end of the stem, a soft-rubber casing arranged within the outer casing having a terraced aperture therein forming valve-seats, a series of substantially non-resilient concavo-convex valve-faces arranged within said soft-rubber casing, said valve-faces being provided upon their convex surfaces with centrally-situated teats, a head provided upon its upper surface with a centrally-situated teat and a series of concentrically-arranged air-ports, said head being secured within the outer casing at its base to maintain the soft-rubber inner casing in position within the outer casing, and coil-springs disposed upon the teats above named whereby to maintain the valves separated from each other and the head, and a screw-threaded sleeve working upon the outside of the casing provided with a laterally-projecting flange, and a binding-nut disposed upon the outside of the case above the sleeve whereby to lock the sleeve in position, substantially as specified.

Signed at the city of New York, in the county and State of New York, this 18th day of September, 1897.

FRANK M. BELL.

Witnesses:
WILLIAM L. POLLACK,
GUSTAVE DIETERICH.