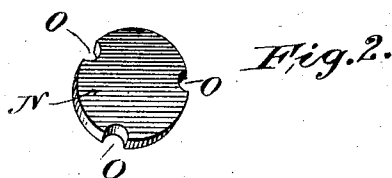
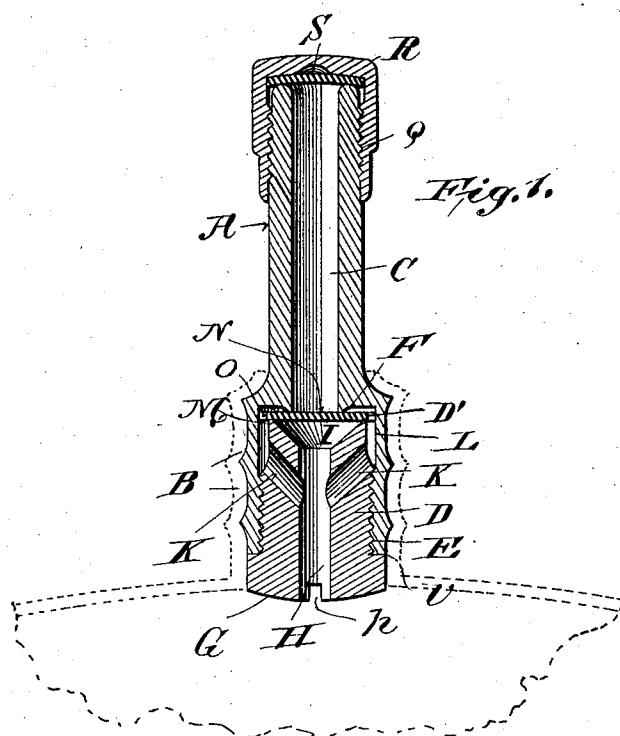


(No Model.)

G. JOHANSSON.
VALVE.

No. 605,549.

Patented June 14, 1898.



WITNESSES

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GUSTAF JOHANSSON, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO HIMSELF,
WILLARD P. SMITH, AND DE WITT ROMAINE, OF SAME PLACE.

VALVE.

SPECIFICATION forming part of Letters Patent No. 605,549, dated June 14, 1898.

Application filed November 21, 1896. Serial No. 613,041. (No model.)

To all whom it may concern:

Be it known that I, GUSTAF JOHANSSON, a subject of the King of Sweden and Norway, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Valves, of which the following is a specification, such as will enable others skilled in the art to which it appertains to make and use the same.

My improved form of valve of this invention, while not limited to such use, is more particularly designed for and intended to be used as an inlet-valve for bicycle-tires or other inflatable air or gas bags or other fluid-receptacles, through which the same may be filled with air or other fluid under pressure; and the same consists in substance of a suitable stem having a longitudinal air-passage, an annular valve-seat, an enlarged chamber below the valve-seat, a valve-disk compressible in its own substance, and a plug for the enlarged chamber for forcing the valve-disk against the valve-seat, although it is not to be understood that the invention is limited to a device necessarily comprising all the elements set forth above, for such invention consists in the construction of certain devices and parts and the arrangement and combination of certain devices and parts, all as hereinafter more specifically described in the specification and pointed out in the claims.

The improved form of valve of this invention is more fully shown and described in the following specification, of which the accompanying drawings form a part, wherein similar letters of reference designate like or equivalent parts wherever found throughout the several views, and in which—

Figure 1 is a view of my improved form of valve in central longitudinal section thereof. Fig. 2 is a top plan view of the valve or valve-disk, in this case in the form of a plate; and Fig. 3 is a view in central longitudinal section of a valve or valve-disk of a slightly-modified form of construction from that shown in Fig. 2.

Referring to the drawings, the reference-letter A designates a tube or valve-stem of any suitable material, usually brass, provided at the lower end with one or more exterior annular grooves B, by which the same is se-

cured in the usual manner by cement or wiring in the soft-rubber entrance-tube of the bicycle-tire or other receptacle, which tube is of the ordinary form and is shown in dotted lines. Running down through the center of the tube A is an air-passage C, ending at the bottom in an enlarged chamber D, provided at the bottom with an interior screw-thread E. At the lower end of the small passage C and at the top of the enlarged lower portion thereof, D, is formed the valve-seat F, which valve-seat is preferably of the form shown, consisting of an annular downwardly-extending knife-edged flange formed, preferably, by reaming out both the passage C and the upper portion of the chamber D around and within such downwardly-extending valve-seat or flange by means of a suitable tool, or such valve-seat may be of any suitable form.

Screwed into the chamber D is a suitable screw-plug G, having a cup-shaped cavity I at the top and provided with a central longitudinal air-passage H, extending from top to bottom longitudinally thereof and communicating with the center of such cavity I, and the top portion of such plug G is made smaller than the rear portion thereof, so that for a short distance around the same when in position in the chamber D an annular chamber or passage L will be left surrounding the top portion of such plug, and formed in and through the contracted top portion of such plug G and extending from such annular passage L to the longitudinal passage H thereof are one or more passages K, or in some cases instead of making the top portion of the plug G of smaller size longitudinal slots may be cut down from the top thereof, so as to communicate with the outer ends of the passages K, so as to answer the same purpose. The plug G is provided at the bottom with an annular shoulder U, which when the same is screwed fully home abuts against the bottom of the stem A, and such plug G is also preferably provided with a cross-slot n, adapted to receive the end of a screw-driver for screwing the same in place. The length of the plug G is such that when screwed fully home a space D' will be left between the top of such plug and the annular valve-seat F, and this space D' is in some cases of slightly greater

and in others of slightly less depth than the valve-disk N, located therein, is thick; but for bicycle-tires especially I prefer to have the chamber D' of less thickness than the valve-disk for the reasons hereinafter given.

The valve-disk N is preferably of the form shown in Figs. 1 and 2, and is preferably composed wholly of soft flexible virgin rubber or other similar suitable material and is formed either of slightly less diameter than is the circular chamber D, or may be of the same diameter and provided with one or more serrations or grooves O at the edge, as shown in Figs. 1 and 2.

The modified form of the valve-disk N shown in Fig. 3 differs only from that shown in Fig. 2 in that the entire body of the disk N instead of being formed of soft rubber or other suitable flexible material is provided on the under side with a non-flexible back plate P, formed of hard rubber, brass, or other suitable hard material. The tube A, in order to provide against accidental leakage of the valve, is also preferably provided at the top with a suitable screw-thread Q, adapted to receive a suitable screw-threaded cap R; so as to force down upon the top of the tube or valve-stem A a suitable soft-rubber washer S, so as to completely close the passage C at the top.

The operation of the device is as follows: It being desired to inflate a tire or fluid-receptacle or introduce air or other fluid into any receptacle of which this valve forms the inlet, the cap R is unscrewed, the washer S removed, and the outlet-pipe of a suitable pump is then screwed firmly upon the screw-thread Q at the top of the tube or valve-stem A. The pump being then operated the air or other fluid under pressure will then pass down through the passage C and will force the valve-disk N down away from the valve-seat F in the center thereof into the cavity I, and as the pressure increases the rubber will be compressed at the edge, so as to form an air passage or passages between the top of the same and such valve-seat F to the serrations or grooves O or to the extreme edge of the disk when the same is of smaller diameter than the chamber D, so as to allow passage of the air down into the passage or passages L, and thence by way of the passages K and II into the tire or receptacle, and the instant the pump ceases to work the natural elasticity of the disk N will repress the same against the valve-seat F and the back pressure of the air or other fluid in the tire or receptacle will press the same more firmly thereto than before; and it will be seen that by reason of the softness of such valve-disk and its flexibility a close joint will always be made even with a valve-seat of crude form and that little, if any, air can possibly escape through a valve of this construction.

When the valve-disk N is of less thickness than the chamber D', when the air-pressure is sufficient, and the pump is stopped, it will be found that the back-pressure action of the

air passing up through the top of the passage II to the center of the cavity I will force such disk N up against the valve-seat F, so as to close the channel C'; but, as before stated, I prefer the form of my invention shown in Fig. 1, in which the soft flexible rubber disk N is at all times pressed against the valve-seat F by the pressure of the end of the plug G. In some cases disks of various forms or even cones or balls and of any suitable materials may be used in combination with a suitable seat and with a plug G with good effect, and it is evident that many changes in the construction, combination, and arrangement of the several parts of my improved valve other than those mentioned may be made without departing from the scope of such invention; and I do not intend to limit myself to any particular material or materials for forming the same or to any particular construction of the whole or any part thereof; but,

Having now particularly described and ascertained the nature of my said invention, its construction, and operation, what I claim, and desire to secure by Letters Patent, is—

1. In a valve of the class described, the combination with a suitable hollow valve-stem or inlet-pipe, of an imperforate elastic valve-disk normally under rigid mechanical annular pressure so as to close the inlet but adapted to yield by compression of its own substance at the point of annular pressure under the pressure of incoming fluid so as to allow of the entrance of the fluid to the receptacle past the annular seat or seats at the point or points of compression, substantially as shown and described.

2. In a valve of the class described, the combination with a hollow valve-stem or inlet-pipe A having the longitudinal passage C and the enlarged bottom chamber D, of a plug G secured in the end of the chamber D so formed as to leave a passage L, such plug having the cup-shaped cavity I at the top, and passages II and K, and a suitable valve or disk N located in the chamber D between the inner end of the plug G and the passage above the same, substantially as shown and described and for the purposes set forth.

3. In a valve of the class described, the combination with a hollow valve-stem or inlet-pipe A having the longitudinal passage C and the enlarged bottom chamber D of a plug G secured in the end of the chamber D, and provided with a small-sized upper portion so as to leave an annular space L surrounding the same when in position in the chamber D, also having the cup-shaped cavity I at the top, and passages II and K, and a suitable valve-disk N of a soft flexible material such as rubber located in the chamber D between the inner end of the plug G and the passage above the same, substantially as shown and described and for the purposes set forth.

4. In a valve of the class described, the combination with a spindle or valve-stem A having the longitudinal passage C and the en-

larged bottom chamber D, of a plug G secured in the inner end of the chamber D and provided with a space or passage L and cup-shaped cavity I at the top, and passages H and K, the passage H communicating with the central portion of the cavity I and the passage or passages K with the space or passage L and passage H, and a suitable valve or disk N located in the chamber D between the inner end of the plug G and the passage above the same, substantially as shown and described and for the purposes set forth.

5. In a valve of the class described, the combination with a spindle or valve-stem A having the longitudinal passage C and the enlarged bottom chamber D, of a plug G secured in the inner end of the chamber D and provided with a space or passage L and the cup-shaped cavity I at the top, and passages H and K, the passage H communicating with the central portion of the cavity I and the passage or passages K with the annular space L and passage H, and a suitable valve-disk N of a soft flexible material such as rubber located in the chamber D between the inner end of the plug G and the passage above the same, substantially as shown and described and for the purposes set forth.

6. In a valve of the class described, the combination with a hollow valve-stem or inlet-pipe having a bottom chamber at the top of which bottom chamber is an inward-faced valve-seat, of a plug secured in said bottom chamber having a valve-seat faced toward the first-named valve-seat, an imperforate valve-disk of compressible elastic material normally compressed between the two valve-seats, and a passage or passages formed in or through the plug for the entrance of the fluid to the receptacle when the elastic compressible valve-disk is compressed by the pressure of the incoming fluid, substantially as shown and described and for the purposes set forth.

7. In a valve of the class described, the combination with a hollow valve-stem or inlet-pipe having a bottom chamber at the top of which bottom chamber is an inward-faced valve-seat, of a plug having a central passage secured in said bottom chamber and having a valve-seat faced toward the first-named

valve-seat and a central depression within the valve-seat, an imperforate valve-disk of compressible elastic material normally compressed between the two valve-seats, and a passage or passages formed in or through the plug for the entrance of the fluid to the receptacle when the elastic compressible valve-disk is compressed by the pressure of the incoming fluid, substantially as shown and described and for the purposes set forth.

8. In a valve of the class described, the combination with a hollow valve-stem or inlet-pipe having a bottom chamber at the top of which bottom chamber is an inward-faced valve-seat, of a plug secured in said bottom chamber having a valve-seat faced toward the first-named valve-seat, an imperforate valve-disk of compressible elastic material normally compressed between the two valve-seats, and means for permitting the fluid forced through the inlet-pipe and between the valve-seat at the top of the chamber and the valve-disk to thereafter pass to the rear of the plug, substantially as shown and described.

9. In a valve of the class described, the combination with a hollow valve-stem or inlet-pipe having a bottom chamber at the top of which bottom chamber is an inward-faced valve-seat, of a plug secured in said bottom chamber having a valve-seat faced toward the first-named valve-seat, an imperforate valve-disk of compressible elastic material normally compressed between the two valve-seats, means for permitting the fluid forced through the inlet-pipe and between the valve-seat at the top of the chamber and the valve-disk to thereafter pass to the rear of the plug, and means for transmitting the back pressure of the fluid within the receptacle to the rear of the valve-disk so as to force the same against the valve-seat at the top of the chamber, substantially as shown and described.

Signed at the city and county of New York, in the State of New York, this 7th day of November, A. D. 1896.

GUSTAF JOHANSSON.

Witnesses:

A. H. DE PAULA COELHO,
C. M. HILL.