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F. W. DODGE

VALVE

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Fig. 2

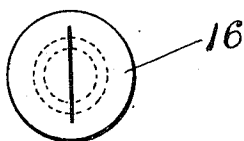
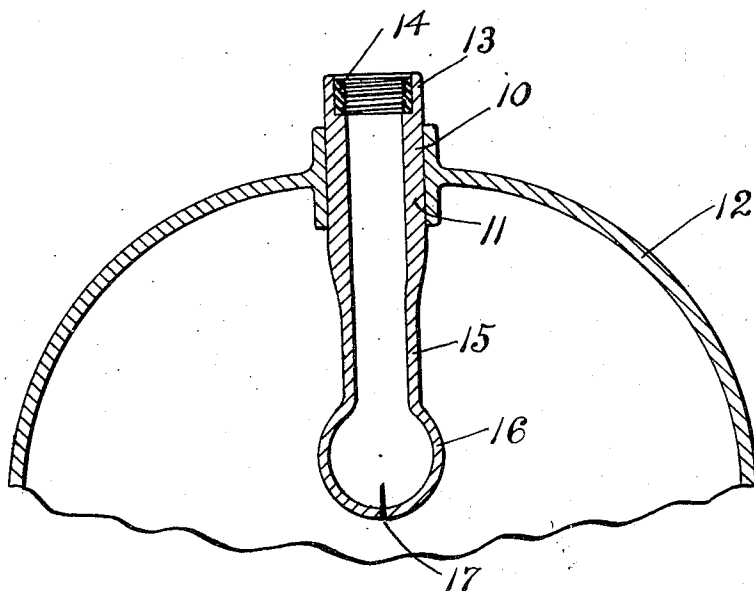


Fig. 1



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UNITED STATES PATENT OFFICE.

FRANK W. DODGE, OF NEW HAVEN, CONNECTICUT.

VALVE.

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To all whom it may concern:

Be it known that I, FRANK W. DODGE, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Valves, of which the following is a full, clear, and exact description.

This invention relates to valves and with regard to certain more specific features thereof to rubber valves adapted to be employed in connection with inflatable articles such as toy balloons, toy balls, dolls and like devices.

The invention has for one of its objects the provision of a simple, inexpensive and durable device capable of permitting the introduction of air under pressure to a container such as a balloon or rubber doll and adapted to be self-sealing in operation to prevent exhaust of the air when the introducing pressure is relieved. It is also a feature of the invention that a valve of this simple and inexpensive construction shall include a safety characteristic preventing, or relieving undue air pressure in the article with which the valve is assembled.

Other objects will be in part obvious and in part pointed out particularly hereinafter.

The invention accordingly consists in the various features of construction, combinations of elements and arrangements of parts which are exemplified in the accompanying drawings and descriptive text, and the scope of the application of my invention will be indicated in the appended claims.

In the drawing, wherein is illustrated one of various possible embodiments of the invention:

Fig. 1 is a view in vertical section of the improved valve in assembly with an air container.

Fig. 2 is a view in end elevation of the improved valve, showing the perforated or slotted head.

Referring now more particularly to the drawing, there is indicated at 10 a tubular element preferably of rubber. This tubular element 10 comprises a stem portion 11 of such thickness as not to be collapsible under ordinary or usual pressure. The stem portion of the tubular element 10 may be exteriorly fitted with a band of uncured rubber (not shown), so as to be readily vulcanizable with the stem and with the

article to be inflated, which latter is indicated by the reference numeral 12. By this means the valve may be permanently associated with the inflatable article or, if desired, any other suitable means of connection may be employed. The tubular element 10 of the valve is preferably arranged with the inflatable article so that a nipple portion 13 is left projecting outwardly, and a small threaded insert 14 possibly of hard rubber may be attached within the nipple portion of the tube so that in turn a closure cap of any suitable construction may be employed.

The stem portion 11 of the tubular element 10 is continued into a neck portion 15 and thence, in the preferred form shown, into a round head portion 16 perforated as by the slot indicated at 17. It is to be noted that the walls of the neck and head portions of the valve are of reduced thickness and it is intended that these walls shall be flexible or collapsible under predetermined air pressures.

In the process of inflation the article 12 containing the valve may be held in the hand and air introduced under pressure through the tubular element 10 as from the mouth of the operator applied to the nipple 13. The tensile strength and elasticity of the head portion of the valve is such that under ordinary pressure of this character, the head will be dilated at the slot 17, permitting air to enter the article 12. As the inlet air pressure is relieved the external air pressure on the wall 16 will cause registration of the opposed side walls of the slot 17 checking the exhaust of air through the tubular element 10. This condition of a checking action by external air pressure on the side walls of the head 16 will be maintained until the air pressures within the container 12 attain a certain level predetermined as the maximum pressure of safety, or efficiency. The neck portion 15 and its wall are so constructed with regard to strength, elasticity, and interior cubical content of air that higher level air pressures in the container 12 will cause collapse of the neck portion 15 in such manner as to automatically separate the side walls of the slot 17, thus permitting the escape of air until the pressure has been reduced to the proper level.

It will be noted that this invention has

particular usefulness in connection with, and adaptability to, mouth blown devices such, for example, as toy balloons and inflatable rubber dolls, where the inflation is effected by a series of breaths. In the present instance as each breath is exhausted the opening 17 is automatically sealed by the exterior air pressure on the wall 16 of the globular head, until such time as additional breaths increase the air pressure to the extent of collapsing the walls of the neck 15 in which event the slot 17 allows for the immediate return of air to reduce the pressure to its proper level.

As many changes could be made in the above construction and as many apparently widely different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. An air valve of rubber comprising a stem portion for association with an air container, a globular head portion provided with a slot and a restricted neck leading from the stem to the globular head, the walls of the said globular head portion and restricted neck being resilient and thinner than the wall of the stem and adapted to be influenced under varying air pressures to cause the opening and closing of the said slot in the globular head portion.

2. An air valve of rubber comprising a stem portion for association with an air container, a resilient neck portion, a resilient globular head extending from said neck portion and provided with a slot, the walls of the neck portion and globular head being thinner than the wall of the stem portion constituting automatic sealing means when inlet air is stopped, whereby the resilient head portion being under ordinary inlet air pressure is adapted to dilate and thereby cause the slot to be opened and air to enter the air container until the air pressure within the air container attains a certain predetermined level, when the slot will be automatically closed and thus maintained by

external pressure of air on the thin resilient wall of the globular head.

3. An air valve of rubber comprising a stem portion for association with an air container, a resilient neck portion having a thin wall, and a resilient globular head provided with a slot constituting safety means for preventing undue air pressure in the air container, whereby the wall of the said neck portion being thinner than the wall of the stem portion and having a cubical air content so arranged that a higher air pressure in the air container will cause automatic collapse of the resilient neck portion, thereby causing the wall of the resilient globular head to yield and thus cause the said slot to open and air to escape until the pressure has been reduced to a proper level, when the slot will be automatically closed by external pressure of air on the globular head.

4. A rubber valve comprising an inlet for association with an air container, the inlet being provided with a neck terminating in a perforated head chamber, the said neck and head chamber being characterized by thin, flexible rubber walls thinner than the wall of the inlet, which permit the introduction of air under pressure through the perforated head into the air container and act to prevent the exhaust of said air when the pressure in the inlet is stopped and which further act, when the air pressure in the air container on the thin wall of the neck exceeds a predetermined relation to air pressure in the inlet, to provide an exhaust through said perforated head chamber to automatically relieve the excessive air pressure in the air container.

5. A valve for inflatable dolls and other like articles, comprising an attenuated tubular element adapted to be inserted through and attached to a surface of the doll with open end exposed as a nipple, the said tubular element comprising a stem portion, a neck and head, the neck and head having thin, flexible walls, thinner than the wall of the stem portion, the said head being closed except for a slot, the side walls of which meet under ordinary atmospheric pressure.

FRANK W. DODGE.