E. BENSON.

CHECK VALVE.

APPLICATION FILED DEC. 12, 1916.

1,256,648. Patented Feb. 19, 1918.

Fig. 1.

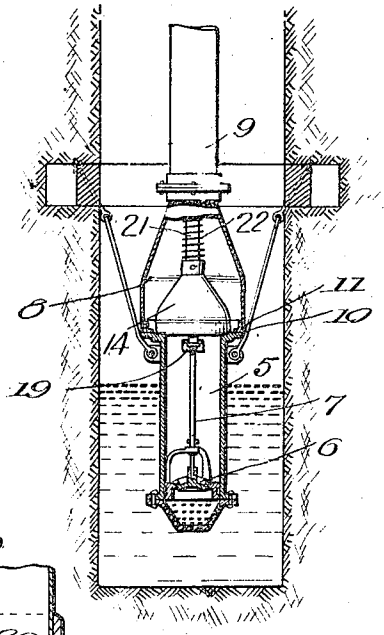


Fig. 2.

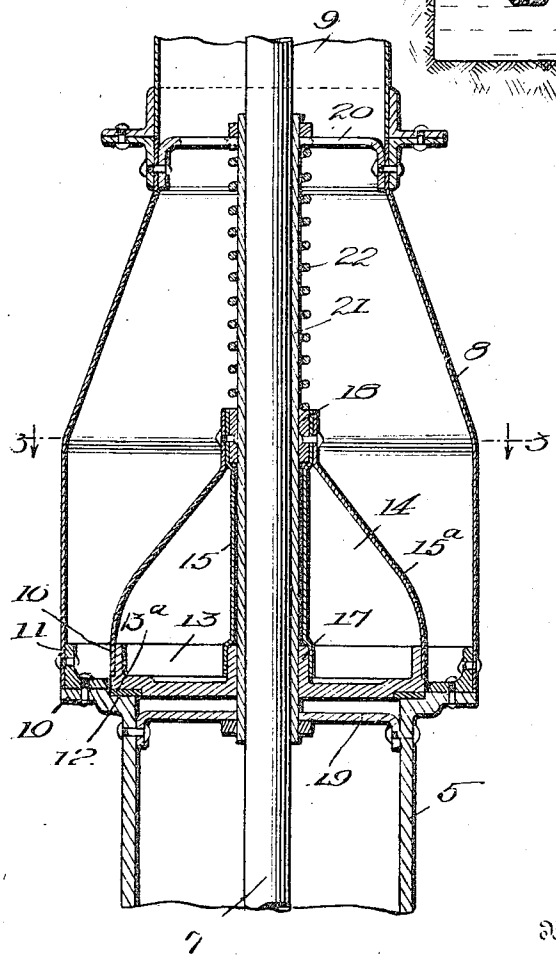
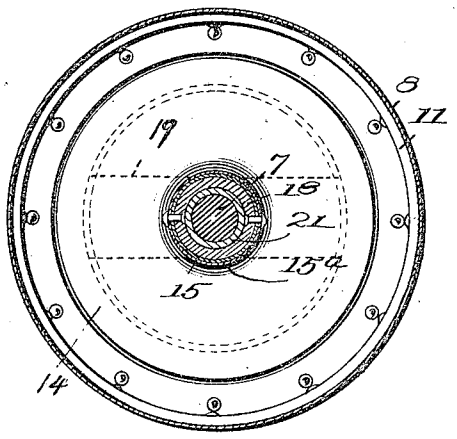


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD BENSON, OF MIAMI, ARIZONA.

CHECK-VALVE.

1,256,648. Specification of Letters Patent. Patented Feb. 19, 1918.

Application filed December 12, 1916. Serial No. 136,450.

To all whom it may concern:

Be it known that I, EDWARD BENSON, a citizen of the United States, residing at Miami, in the county of Gila and State of Arizona, have invented new and useful Improvements in Check-Valves, of which the following is a specification.

This invention relates to check valves employed in connection with pumps for preventing a flow of water back into the pump cylinder.

The invention has for its object to provide a novel and improved valve of the kind stated which is buoyant so that its opening movement is rapid, the structure of the valve being such that a rapid closing movement is also obtained.

With the object stated in view, the invention consists in a combination and arrangement of parts to be hereinafter described and claimed, and in order that the same may be better understood, reference is had to the accompanying drawing forming a part of this specification.

In the drawing,

Figure 1 is an elevation of the pump, partly in section, showing the application of the invention,

Fig. 2 is a central vertical section of the valve, and

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2.

Referring specifically to the drawing, 5 denotes a pump cylinder in which works a valved plunger 6 carried by a rod 7. To the top of the cylinder is connected a valve chamber 8 from which a discharge pipe 9 extends. The top of the cylinder has an outstanding flange 10 to which is fastened, by means of an angle bar 11, the bottom of the valve chamber.

The top of the cylinder 5 is formed with a seat 12 for a valve housed in the chamber 8, said valve operating as a check valve to prevent a back flow into the cylinder. This valve is composed of a brass disk 13 and a float chamber 14 carried thereby. The disk is fitted on the bottom with a packing ring or gasket 13ª to engage the seat 12. The float chamber 14 is substantially cone shaped, or tapered, the taper being upward, and it is formed of an inner shell 15 and an outer shell 15ª. The outer shell 15ª is secured at the bottom to an upstanding marginal flange 16 on the valve body or disk 13, and the bottom of the inner shell 15 is secured to a hub 17 upstanding from the back of the disk 13. The two shells converge in the direction of their upper ends and meet thereat, being here fastened to a collar 18.

In the upper end of the cylinder 5 is fixed a cross bar 19 and in the upper end of the valve chamber 8 is fixed a cross bar 20. These two cross bars support a tubular guide 21 for the check valve, said guide being a pipe which passes through the collar 18 and through the hub 17 of the valve disk 13, the collar and the hub being loose on the pipe so that the valve is free to slide up and down thereon, it being thus guided by the pipe. The plunger rod 7 passes through the pipe 21 and therefore does not interfere with the free movement of the valve.

The chamber 14 is air tight and serves as a float, the valve 13 being thus rendered buoyant, in view of which it will move upward to open position with a quick stroke. The downward closing movement is also rapid by reason of the large surface area of the air chamber against which the water presses downward. It will be understood, of course, that the buoyancy of the valve is not great enough to cause it to remain floating in the chamber 8, as this would prevent it from seating. The air chamber will be designed to obtain such a degree of buoyancy as will nearly equal the resistance of the valve to an upward movement due to its weight and inertia. The closing movement of the valve is aided by a spring 22 interposed between the collar 18 and the cross bar 20.

I claim:—

1. In a pump, a check valve comprising a disk having an upstanding marginal flange and central hub, an air-tight chamber carried by the back of the disk and composed of inner and outer shells, the lower end of the outer shell being fastened to the aforesaid flange and the corresponding end of the inner shell being fastened to the hub, said shells converging toward their upper ends and connected thereat, and a collar to which the last mentioned ends of the shells are fastened.

2. In a pump, a check valve comprising a

disk having an upstanding marginal flange and central hub, an air-tight chamber carried by the back of the disk and composed of inner and outer shells, the lower end of the outer shell being fastened to the aforesaid flange and the corresponding end of the inner shell being fastened to the hub, said shells converging toward their upper ends and connected thereat, a collar to which the last mentioned ends of the shells are fastened, and a guide for the valve passing through the hub and the collar.

In testimony whereof I affix my signature.

EDWARD BENSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."