

Feb. 26, 1924.

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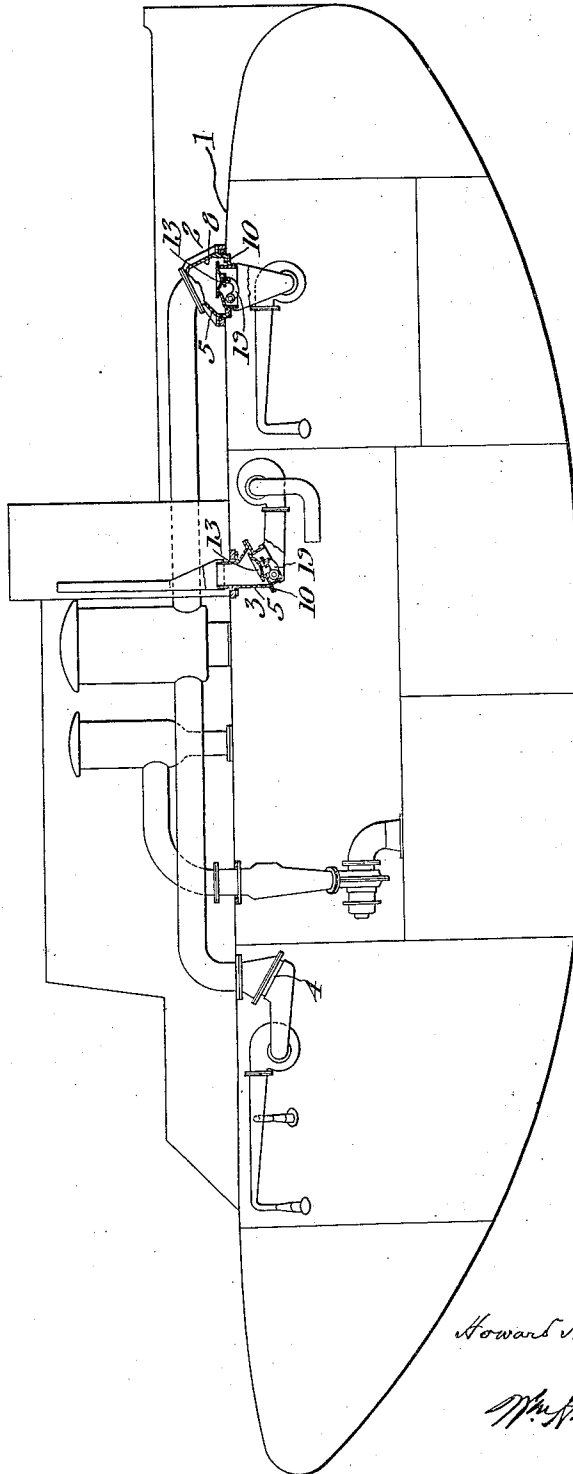
H. H. HOFFMAN

SAFETY QUICK CLOSING VALVE

Filed May 11, 1921

2 Sheets-Sheet 1

Fig. 1.



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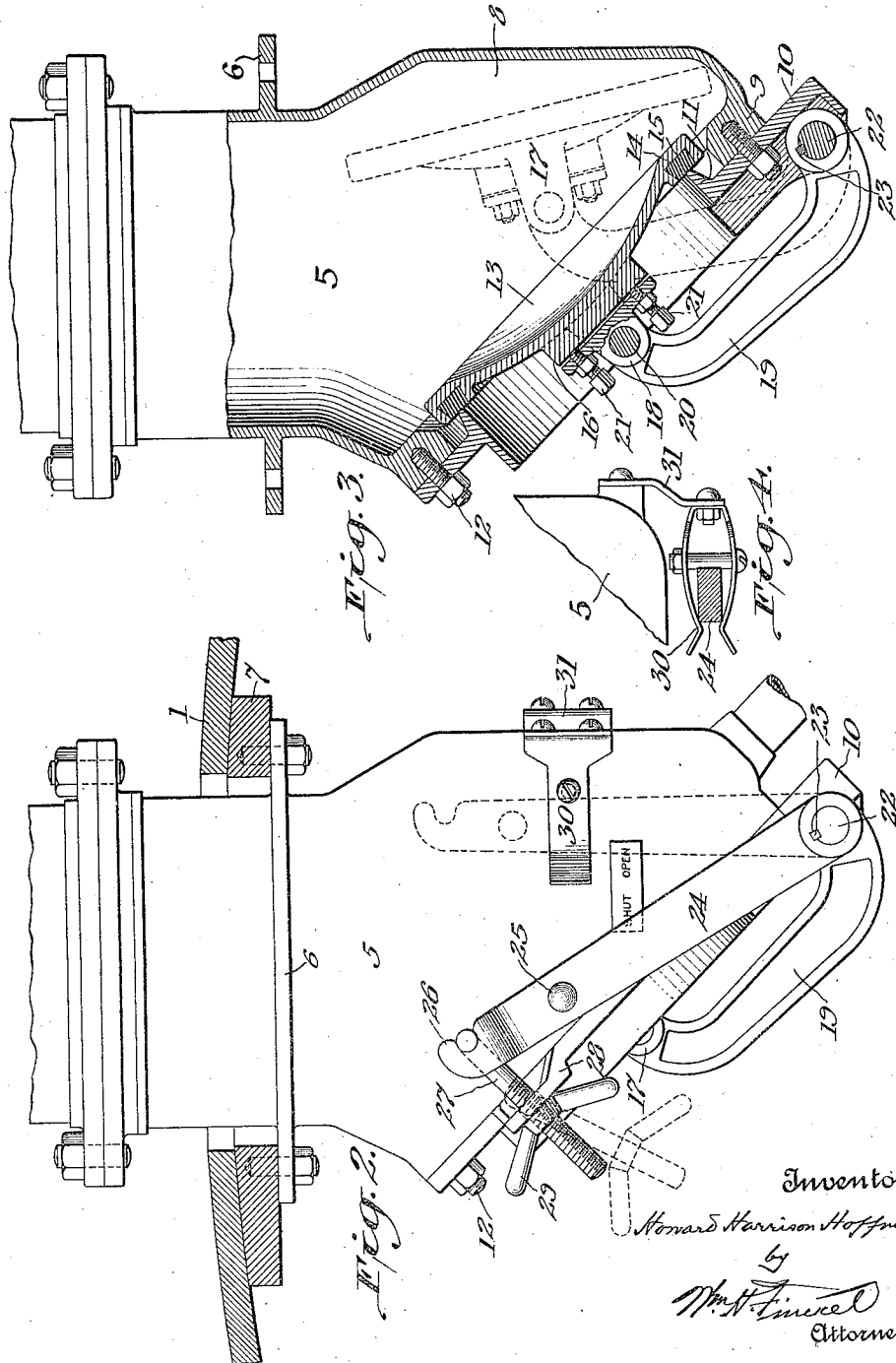
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UNITED STATES PATENT OFFICE.

HOWARD H. HOFFMAN, OF FAIRFIELD BEACH, CONNECTICUT, ASSIGNOR TO THE LAKE TORPEDO BOAT COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF MAINE.

SAFETY QUICK-CLOSING VALVE.

Application filed May 11, 1921. Serial No. 468,558.

To all whom it may concern:

Be it known that I, HOWARD H. HOFFMAN, a citizen of the United States, residing at Fairfield Beach, in the county of Fairfield and State of Connecticut, have invented a certain new and useful Improvement in Safety Quick-Closing Valves, of which the following is a full, clear, and exact description.

The primary object of this invention is the production of a safety quick-closing valve for use in the main strength hull of a submarine boat where pierced by the ventilation piping, so that in the event of the conning tower being pierced by shell-fire or damaged by other means in such way as to admit water and thus expose the boat to the danger of sinking or foundering, the inrushing water would tend to close the valve quickly and practically automatically, even to the extent of overcoming the resistance of a spring-held valve-operating lever. The invention, however, is not limited to this specific use of the valve, since it may be employed in other connections where quick closing is desirable.

The invention consists of a bodily movable valve disk operating in a valve casing in such way that when open it would be exposed to an inrush of water, and provided with subjacent operating mechanism of such character and so arranged that when thus exposed, the valve disk will be seated or closed quickly so as to exclude the water from entering the subjacent piping or other portions of the apparatus in which the valve is installed, the valve disk being held in the open position preferably by a friction arrangement the resistance of which is overcome by the weight or volume of water; there being also provided means for locking the valve disk in closed position, as I will proceed now to set forth and finally claim.

Within the above stated reservation of the utility and applicability of the invention, I will proceed to describe the invention as applied to the ventilating system of a submarine boat.

In the accompanying drawings illustrating the invention, in the several figures of

which like parts are similarly designated, Figure 1 is a diagrammatic elevation of a submarine boat, of conventional form, showing the valves installed therein in connection with the ventilation system, two of the valves being shown in section. Fig. 2 is an elevation on a larger scale, of one of the valves detached. Fig. 3 is a partial vertical section of the valve shown in Fig. 2. Fig. 4 is a plan view of a valve-operating lever holding-clip that may be employed.

The hull, superstructure, if any, the conning tower, and the ventilation system may be of any approved construction, substantially such as indicated in the diagrammatic view, Fig. 1. As shown, the main strength hull 1 is pierced at three points for the installation of the valves 2, 3, and 4, of this invention, but of course it will be understood that any number of valves may be used to meet the requirements. All of the valves are of substantially the same construction, and a description of one will suffice for all, excepting that in some instances, as shown in valve 2, the valve may have a horizontal seat, or as shown at 3 and 4 and in Figs. 2 and 3, the valve may have an inclined seat, but otherwise the construction and operation are substantially identical.

Referring now to the construction shown in Figs. 2 and 3, 5 is the casing provided with a flange 6, which may be bolted to a member 7 that is made fast in any suitable way to the hull 1. This casing has a pocket 8 into which the valve disk may be opened, as shown in dotted lines in Fig. 3. The lower inclined open end 9 of the casing is arranged to receive the closure member or plate 10, having the valve seat 11, and secured to the casing by bolts 12 or otherwise, so as to be attachable or detachable at pleasure and without disturbing the casing.

13 is the valve disk preferably of dished disk form, and having a rim socket 14 to receive a suitable packing 15 to cooperate with the seat 11 to make a watertight joint, the packing being removable and renewable at pleasure. The valve disk 13 has a suitable projection 16 between ears 17 to receive the knuckle 18 of the valve supporting

link 19 and the securing pintle 20. The knuckle 18 extends from opposite sides of the link and these extensions are provided with set screws 21 bearing on the projection 16 in such way as to permit the disk to teeter slightly and automatically adjust itself to any pressure coming on top of the disk. The link 19 is mounted upon a shaft 22 having bearings in the plate 10 and secured thereon by a key or other device 23, so as to turn with it, and on the outer end of this shaft 22 is a valve-operating lever 24 located outside of the valve casing and provided with a laterally projecting hand operating device 25. This lever 24 may have a forked hook-shaped end 26 adapted to be engaged by any suitable locking device such as a T headed bolt 27 engaging a lateral projection 28 on the plate 10 and itself engaged by a butterfly or other nut 29 seating against the projection 28, this locking device being available for locking the valve disk in the closed position when so desired. In ordinary running, the valve disk will be open, as indicated by dotted lines in Fig. 3, and to hold it in such open position the lever 24 may be engaged by any suitable clip, such as the spring fingers 30, Figs. 2 and 4, mounted upon a bracket 31 fixed to the casing, the resistance of the spring being such as to be capable of being overcome by the weight or volume of water acting against the valve disk to thereby automatically close the valve should an attendant be absent from the valve when closure is desirable or necessary.

The pressure of the water will make the valve disk seat tight and any increase of pressure will increase the tightness of such seating.

As already stated, the valve disk, its seat, and the valve operating mechanism are separate and distinct from the valve casing, and constitute a self-contained unit which is accessible at all times for removal, replacement or repairs without disturbing the casing. Such a unit may be set up or assembled in the shop and applied to the casing readily and without adjustment. Moreover, the operating mechanism is located wholly outside of the valve casing, and is always accessible for lubrication without dismembering or opening up the valve. The valve is bodily movable in the opening and closing operations, and by a very simple and practical mechanism.

As will be noted, the valve opens into the pocket in such way as not to obstruct the flow of air for ventilating purposes, and yet in such an arrangement as to be exposed to the action or pressure of the intruding water in case of accident.

What I claim is:—

1. A valve adapted to close quickly for safety purposes, comprising a casing within

which the aftermentioned valve disk operates, a valve seat member having a valve seat extending into the casing, a valve disk bodily movable within the casing toward and from the valve seat, linkage connecting the valve disk and seat member and arranged outside of the casing, a valve-operating mechanism connected with the linkage, means to releasably hold the valve disk in open position and permit the valve disk to close when said disk is subjected to abnormal pressure, and means to lock the disk in closed position.

2. A valve adapted to close quickly for safety purposes, comprising a casing having a pocket into which the aftermentioned valve disk opens, a valve seat member applied to the casing, a bodily movable valve disk, a link having a teetering pivotal connection with said disk, a shaft on which said link is fastened, said shaft mounted on the valve seat member, and an operating lever applied to said shaft for manually opening and closing the valve.

3. A valve adapted to close quickly for safety purposes, comprising a casing within which the aftermentioned valve disk operates, a valve seat member having a valve seat extending into the casing, a valve disk bodily movable within the casing toward and from the valve seat, linkage connecting the valve disk and seat member and arranged outside of the casing, the connection between the linkage and the valve disk adapted to permit the said disk to teeter and automatically adjust itself to any pressure coming on top of said disk, and a valve-operating mechanism connected with the linkage.

4. A valve adapted to close quickly for safety purposes, comprising a casing within which the aftermentioned valve disk operates, a valve seat member having a valve seat extending into the casing, a valve disk bodily movable within the casing toward and from the valve seat, linkage connecting the valve disk and seat member and arranged outside of the casing, the linkage and disk connection having an adjusting element interposed to permit the said disk to teeter and automatically adjust itself to any pressure coming on top of said disk, and a valve-operating mechanism connected with the linkage.

5. A valve adapted to close quickly for safety purposes, comprising a casing within which the aftermentioned valve disk operates, a valve seat member having a valve seat extending into the casing, a valve disk bodily movable within the casing toward and from the valve seat, linkage connecting the valve disk and seat member and arranged outside of the casing, the said valve disk having a projection and ears, between which ears the linkage is pivoted, and the linkage having a

knuckle provided with lateral extensions
having set screws adapted to bear on the
projections to permit the disk to teeter and
automatically adjust itself to any pressure
5 coming on top of said disk, and a valve-
operating mechanism connected with the
linkage.

In testimony whereof I have hereunto set
my hand this 7th day of May, A. D. 1921.

HOWARD H. HOFFMAN.

Witnesses:

ARTHUR W. GUNN,
CARL E. WILSBURG.