

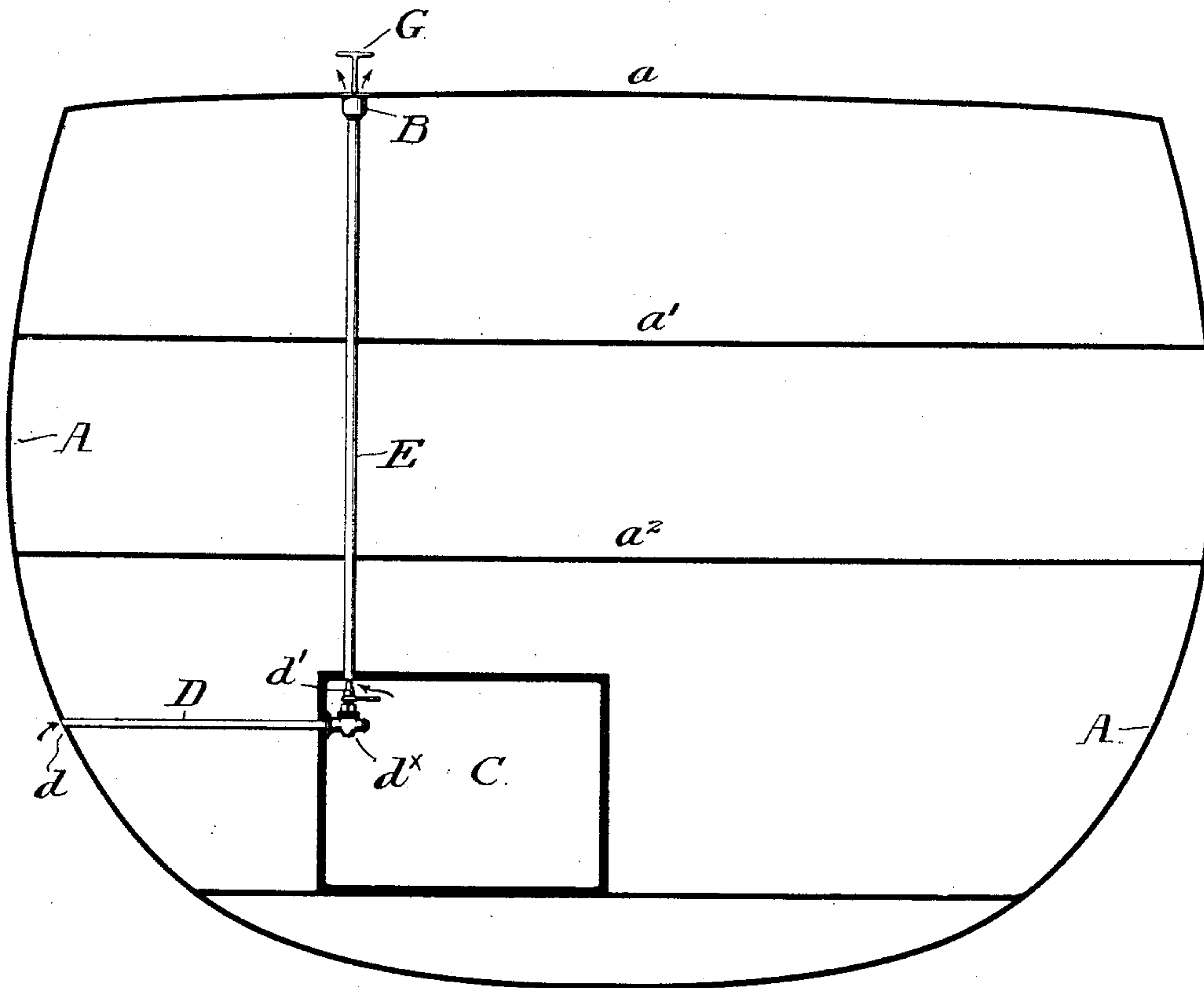
W. TAIT.

DEVICE FOR FLOODING SHIPS' MAGAZINES.

No. 482,282.

Patented Sept. 6, 1892.

FIG. 1.



Wm Tait

WITNESSES:

F. Norman Dixon.  
R. M. Russell

INVENTOR:

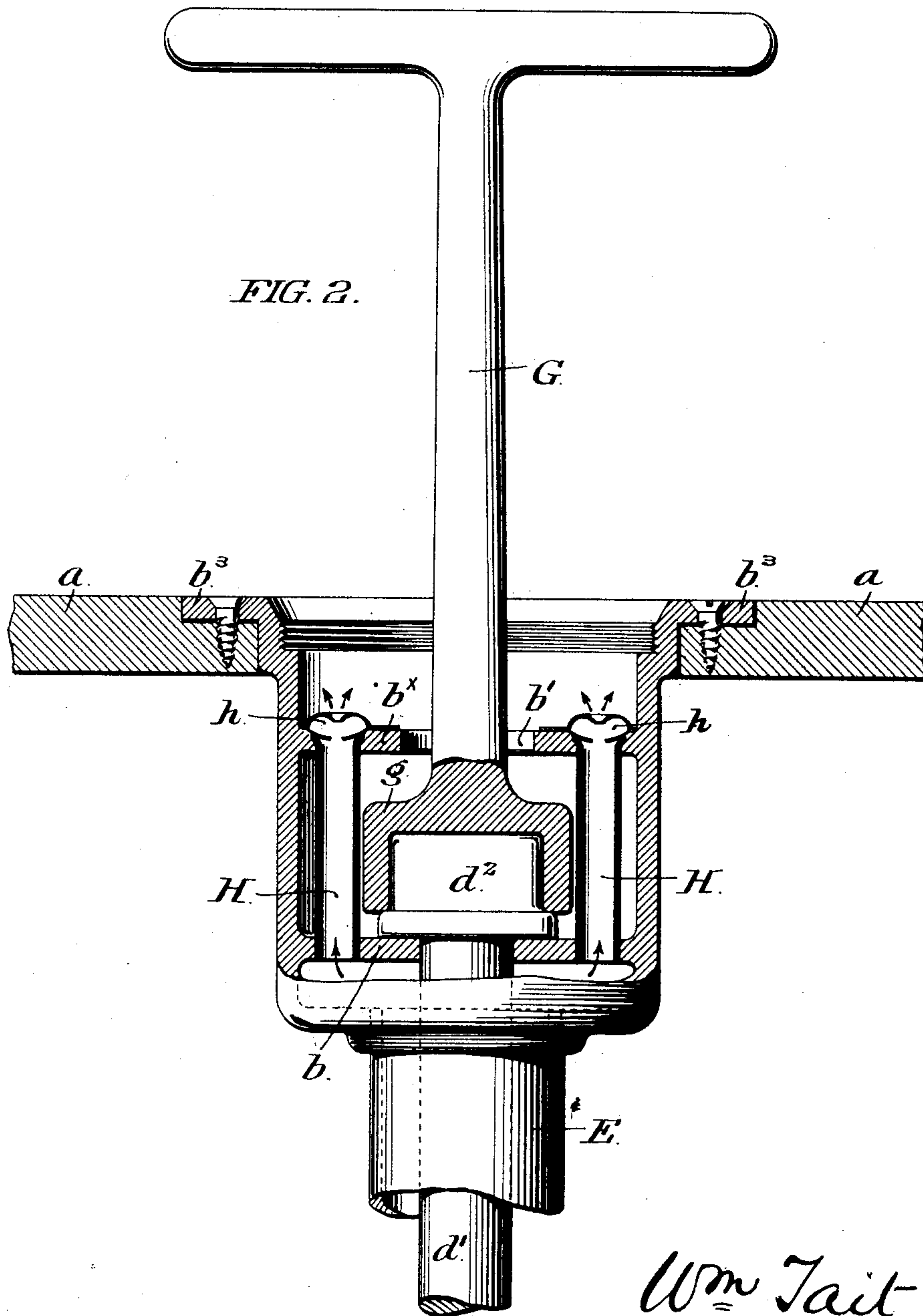
By his Attorneys,  
J. C. Mansie &  
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FIG. 4.

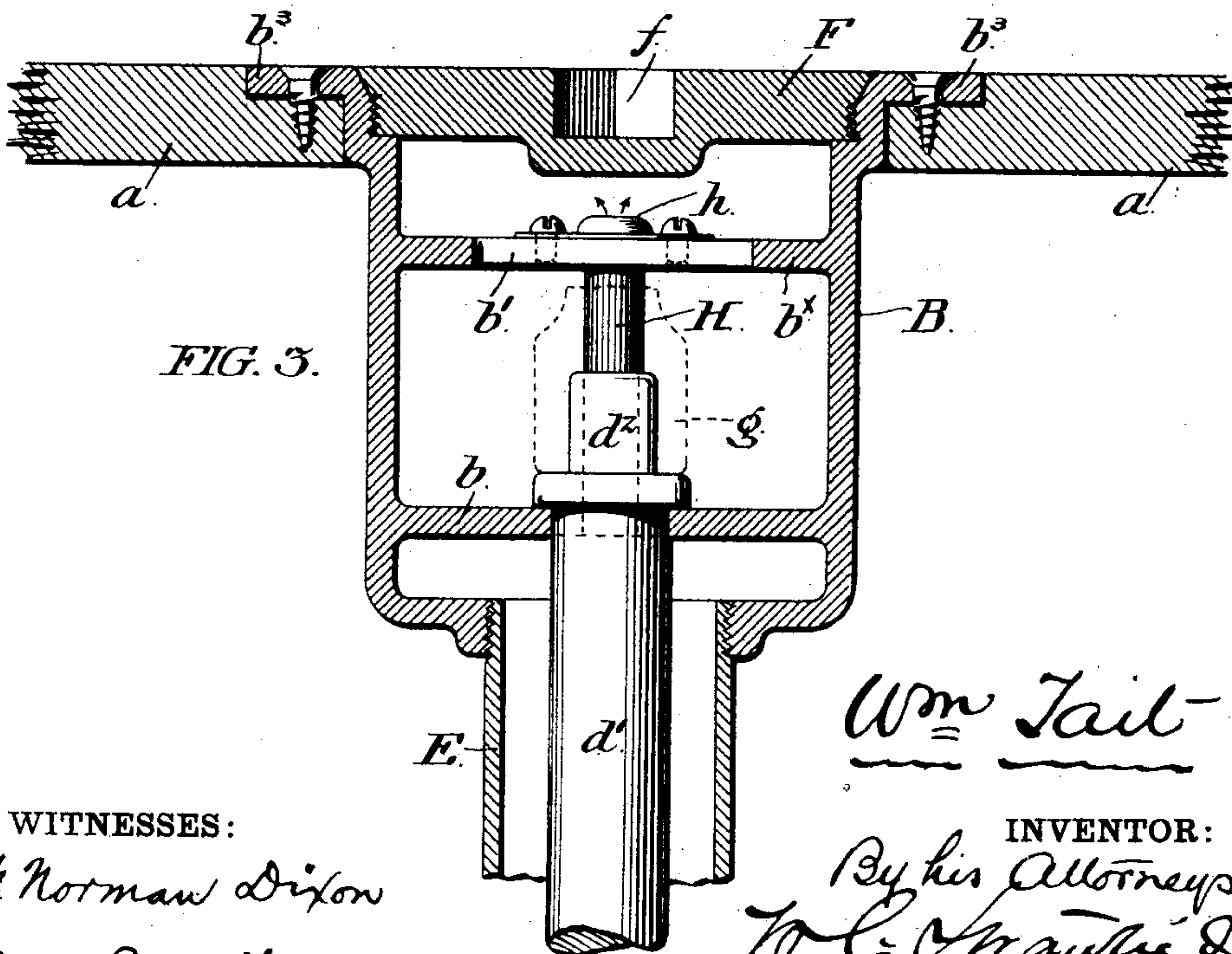
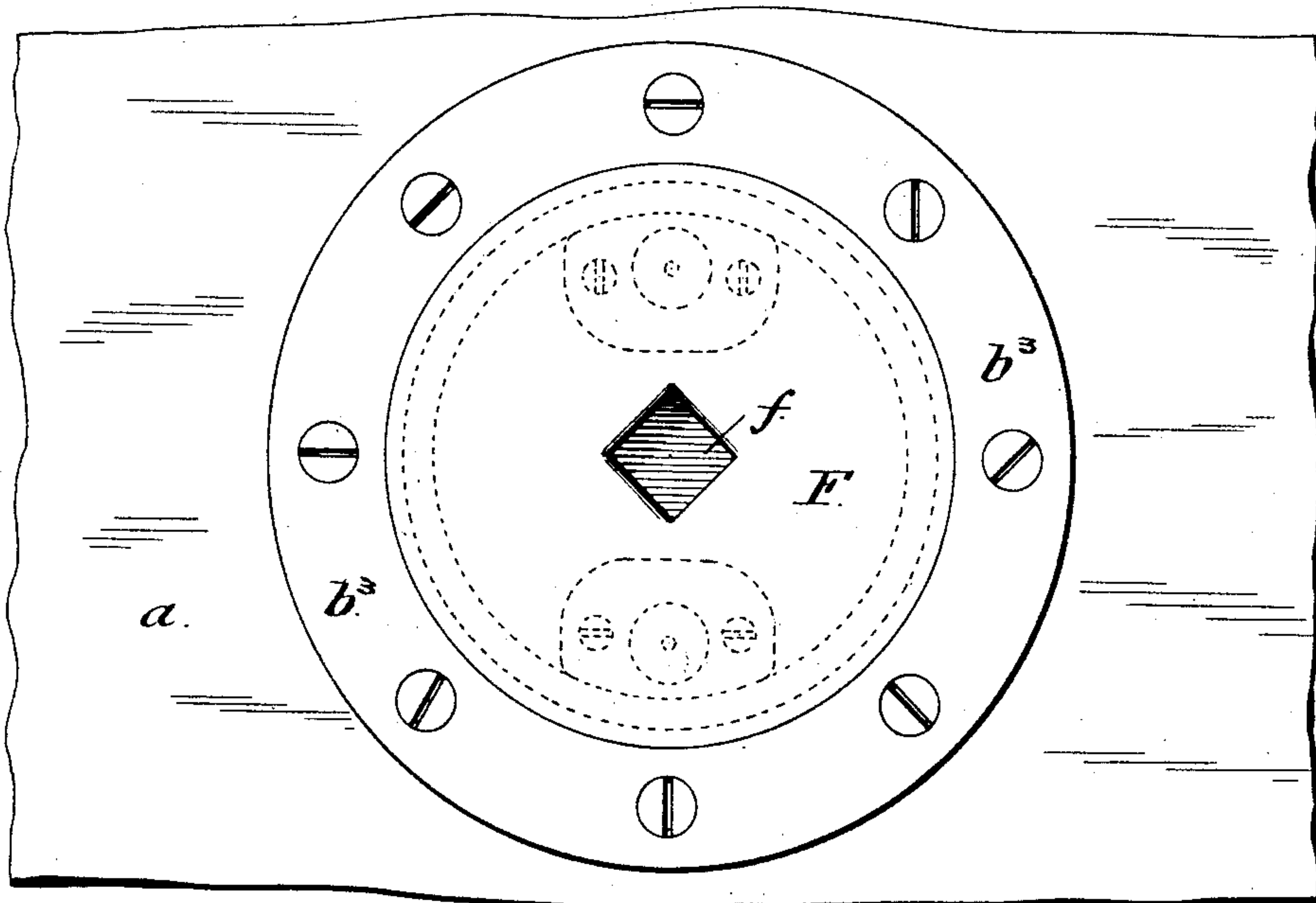


FIG. 3.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

WILLIAM TAIT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE WILLIAM CRAMP & SONS SHIP AND ENGINE BUILDING COMPANY, OF SAME PLACE.

## DEVICE FOR FLOODING SHIPS' MAGAZINES.

SPECIFICATION forming part of Letters Patent No. 482,282, dated September 6, 1892.

Application filed April 13, 1892. Serial No. 428,967. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM TAIT, a citizen of the United States, residing in the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Devices for Flooding Powder Magazines or other Compartments of Ships, of which the following is a specification:

- o In ships provided with magazines for explosives, and particularly in warships, it is usual to provide means for, at will, flooding the magazine by admitting to it sea water through a sea valve in the ship, or water contained in a tank or other receptacle within the ship. In devices of this character the water inlet or flood-pipe to the magazine is provided with a flood cock or valve, preferably within the magazine, which is so arranged as to be operated from a distant point, as, for instance, any deck of the ship, and in warships preferably from the berth or gun-deck, without the necessity of personal approach or direct manipulation. In devices in which this valve or cock is, as stated, controlled from a deck or other distant point,—the magazine being usually located near the bilge,—it is desirable to know with certainty when said cock has been opened, and it is the object of my invention to provide means for the control of a magazine flood-cock from a distant point, which shall be of such character as to unerringly indicate when said cock has been opened, and when, in consequence, the magazine has been completely flooded.

To these ends my invention comprehends the devices represented in the accompanying drawings, and hereinafter described and claimed.

- 40 In the drawings I have represented devices conveniently embodying my invention, and applied in a simple and inexpensive manner.

- 45 Figure 1 is a diagrammatic, transverse, sectional elevation, through the hull of a ship to which my improvements are shown as applied. Fig. 2 is a partly sectional, and partly elevational, detail, through a deck plate embodying my improvements, representing the flood cock, its key and valve-stem, in the position which they respectively occupy when said flood-cock has been opened for the ad-

mission of water to flood the magazine. Fig. 3 is a central, vertical, sectional elevation, through said deck plate, in a plane right angular to that of the section through said plate represented in Fig. 2, but the deck plug being shown in place, the key removed, and the valve-stem in the position which it occupies when the flood-cock is closed. Fig. 4 is a top plan view of the parts represented in Fig. 3.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents the hull of a ship, and  $a$   $a'$   $a^2$  decks of said ship, to the uppermost of which  $a$  is applied the deck plate or casing B.

C is a magazine or other compartment to be flooded, shown as located near the bottom of the ship.

D is a water inlet or flood-pipe represented as leading inwardly through the side of the ship below the water line to within the magazine, and as equipped with a sea valve  $d$  normally open. This flood-pipe is equipped with a valve or flood cock  $d^x$  of any preferred construction, normally closed, and represented as located within the magazine. The valve represented is conveniently a two-way puppet valve, the stem  $d'$  of which is represented as conveniently extending upwardly within and throughout the length of an air-tight inclosing air pipe E, which opens at its lower extremity within the magazine C, and at its upper extremity within the deck plate B. In the arrangement referred to, this pipe is larger in internal diameter than the diameter of the valve-stem, in order to provide an annular air space between said stem and its own inner walls, and it is also preferably concentric with said stem. It is obvious that a quarter turn or rotation of the valve stem in one or the other direction will open or close the flood-cock.

B is, as stated, a casing or deck plate, being preferably an open-topped cylindric chamber or inclosing case, conveniently provided with a peripheral flange  $b^3$  by the aid of which it may be secured with respect to the deck or other fixture. Its upper opening is conveniently internally threaded and adapted to be closed by a circular correspondingly-threaded deck plug F, preferably containing a central



key socket *f* by the aid of which it may be screwed into or out of place with respect to the plate. The plug is a non-essential of the device, and the upper diaphragm hereinafter referred to may be so disposed as to serve as a plug or cover. The deck plate itself is conveniently provided at or near its lower portion with, or formed into an internal diaphragm, which I term the lower or tight diaphragm *b*, through which passes the upper extremity of the valve-stem of the flood cock as through a bearing, the same being free to turn, and preferably tightly fitted.

*b<sup>x</sup>* is a second partition or diaphragm at or near the upper portion of the deck plate, and, if desired, so located as to be its cover, which I term the upper diaphragm, and which is conveniently formed as a web or plate provided with an opening which I term the key opening *b'*, and which is represented as being longer than wide. The upper extremity of the valve-stem *d'* of the flood cock is below this upper diaphragm and is terminated by a key head *d<sup>2</sup>*, or kindred key boss, which also in the construction shown is longer than wide. When a key is applied to this key head, the valve-stem can be rotated and the flood cock opened or closed.

*G* is a flood-cock key of any preferred character, in the construction shown terminating in a socket *g* which is longer than wide. The socket is externally conformed to fit the key opening *b'* in the upper diaphragm, in order that when its longer axis is caused to coincide with the longer axis of said opening the key can be introduced through it,—and is internally conformed to fit the key head of the stem when similarly its longer axis is caused to coincide with the longer axis of said head. When the deck plug, when employed, has been removed, the key, as is obvious, can be introduced through the opening in the upper diaphragm of the deck plate and applied to the head of the valve-stem, so that by the rotation of the key the stem can be rotated and the flood-cock opened or closed.

In the normal set or relationship of the parts as depicted and described, when the flood-cock is closed, the major axis of the key head registers or is in parallelism with the major axis of the key-opening in the upper diaphragm, and the socket of the key can, therefore, be directly introduced through said opening and without any rotation of the key be applied to the head of the stem. Such application having been made, a quarter turn of the key will impart to the stem a quarter rotation and open the flood-cock. In this last position, which is that represented in Figs. 2 and 3, the major axis of the key socket will be at right angles to the major axis of the key opening in the upper diaphragm, and, obviously, it will be impossible to withdraw the key without giving a further quarter turn to it which turn would result in the closing of the cock. It will, therefore, be apparent that so long as the key

is in such position as renders its retraction from the deck plate through the key opening impossible, the flood cock will be open, and the fact of the impossibility of the retraction of the key will indicate the fact that said cock is open.

I prefer to make the key-opening rectangular, and the key-socket and key-head quadrangular, as represented; obviously, however, other forms of opening socket and head, such, for instance as oval lozenge or diamond-shaped, which would permit of the application of the key-socket through the key-opening when the key head was in a given position, and prevent its retraction when such position has been altered by the rotary movement of said head, would fall within the scope of the invention, and I do not therefore restrict myself to the special forms represented and described, it being, as far as this feature of my invention goes, only necessary that the opening in the diaphragm, the socket, and the key-head, should be of such form and such relative correspondence of form, as to permit of the introduction of the key when the flood cock is in its closed position, and prevent the retraction of the key so long as the cock is open. Obviously the socket may be formed on the valve stem and the key head or boss on the key because the socket and key head are simply devices to insure the engagement of the valve-stem with the key for the purpose of the turning of the stem by the key.

Any usual form of stop to limit the rotation of the key-stem to occasion the full opening and the full closure of the cock, may obviously be applied. Assuming the flood-cock to have been opened, it is obvious that air within the magazine without means of escape, would prevent the inflow of the water. In order, therefore, to permit of the venting of the air, and at the same time to indicate when the magazine has been completely flooded, I have provided an air pipe *E*, already referred to as making an air-tight connection between the upper part of the magazine and the lower part of the deck plate, and as conveniently surrounding the stem of the flood-cock; and have also provided one or more whistles *H*, or kindred air-operated alarms, which are represented in the form of tubes to which the letter *H* is applied, and which preferably pass through the lower diaphragm *b*, and conveniently up through the upper diaphragm where they are terminated in whistling mouths *h* of any preferred character.

It is to be observed that while it is preferable, because more compact and convenient, to cause the key-stem to pass through the air pipe, yet that it is not essential, because the air pipe might be an independent pipe terminating in a whistle but not inclosing the valve-stem. Obviously, as the water enters the magazine the air expelled by it will ascend through the air pipe and escape through



the whistles, with the result of causing them to speak, and to continue so to do until the air has been completely vented and the admitted water has found its natural level.

5 When the sounding of the whistles shall cease, the magazine will have been flooded.

The mode of application of the whistles represented in the drawings may be varied at the will of the constructor, and other  
10 purely formal changes in the shape, construction, and mode of application of the above parts may obviously be made.

While I have represented and described my invention as applied in connection with  
15 a magazine for explosives, it is obvious, as referred to, that it may be applied in connection with any chamber or compartment within a vessel or other structure which it is desired to flood with water through a water inlet cock.

20 Having thus described my invention, I claim:

1. In combination:—a magazine or compartment to be flooded,—a water inlet thereto provided with a flood cock or valve,—a valve stem leading from said cock to a casing or deck plate and terminating therein in a key head or socket,—a casing or deck-plate provided with a diaphragm or cover having a non-circular opening through it,—and a valve key the valve-stem-engaging end-portion of which is conformed to the key head or socket of the valve-stem, and registrable with the key opening in order that it may be introduced through  
30 it,—the arrangement being such that the key can only be introduced when its stem-engaging-portion or socket registers with the key opening, and when so introduced, applied to the key head, and with it turned out of registry with said opening, cannot be withdrawn,—substantially as set forth.

2. In combination:—a magazine or compartment to be flooded, an air pipe leading from said magazine and terminating in an alarm,—  
45 a water inlet thereto provided with a flood cock or valve,—a valve stem leading from said cock to a casing or deck-plate and terminating therein in a key head or socket,—a casing or deck plate provided with a diaphragm or cover having a non-circular opening through  
50 it,—and a valve-key the valve-stem-engaging end-portion of which is conformed to the key head or socket of the valve stem, and registrable with the key opening in order that it may be introduced through it,—the arrangement being such that the key can only be introduced when its stem-engaging-portion or socket registers with the key opening, and when so introduced, applied to the key head,  
55 and with it turned out of registry with said opening, cannot be withdrawn,—substantially as set forth.

3. In combination, in a ship:—a magazine or compartment to be flooded,—a water inlet thereto provided with a flood cock or valve,—a  
65 valve stem leading from said cock to a casing

or deck-plate and terminating therein in a key head or socket located above a tight diaphragm through which said stem passes,—a casing or deck plate provided at or near its lower portion with a tight diaphragm and near  
70 its upper portion with a diaphragm or cover having a non-circular opening through it,—an air pipe leading from said magazine to said deck plate and surrounding said valve-stem,—  
75 one or more alarms opening through the tight diaphragm of the deck plate,—and a valve key the valve-stem-engaging end-portion of which is conformed to the key head or socket of the valve stem, and registrable with the key  
80 opening in order that it may be introduced through it,—the arrangement being such that the key can only be introduced when its stem-engaging-portion or socket registers with the key opening, and when so introduced, applied  
85 to the key head, and with it turned out of registry with said opening, cannot be withdrawn,—substantially as and for the purposes set forth.

4. In combination:—a compartment to be flooded,—a water inlet thereto provided with a flood cock or valve,—a valve-stem leading from said cock to a casing or deck plate and terminating therein in a key head  $d^2$ ,—a casing or deck plate B provided with a diaphragm or  
90 cover  $b^x$  having formed through it the key opening  $b'$ ,—and a valve key G having a socket  $g$  externally conformed to the key opening  $b'$  and internally to the key head  $d^2$ ,—the arrangement being such that the key can only be introduced when its socket registers with the  
95 key opening, and when so introduced, applied to the key head, and with it turned out of registry with said opening, cannot be withdrawn,—substantially as and for the purposes  
100 set forth.

5. In combination:—a compartment to be flooded,—an air pipe leading from said compartment and terminating in an alarm,—a water inlet to said compartment provided with  
110 a flood cock or valve,—a valve-stem leading from said cock to a casing or deck plate and terminating therein in a key head  $d^2$ ,—a casing or deck plate B provided with a diaphragm or cover  $b^x$  having formed through it the key-  
115 opening  $b'$ ,—and a valve key G having a socket  $g$  externally conformed to the key-opening  $b'$  and internally to the key head  $d^2$ ,—the arrangement being such that the key can only be introduced when its socket registers with  
120 the key-opening, and when so introduced, applied to the key head, and with it turned out of registry with said opening, cannot be withdrawn,—substantially as and for the purposes  
125 set forth.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 12th day of April, 1892.

WILLIAM TAIT.

In presence of—

F. NORMAN DIXON,  
R. M. RUSSELL.