

G. F. KEATING.
 BUOY ATTACHMENT FOR SUBMARINE BOATS.
 APPLICATION FILED APR. 6, 1911.

1,014,398.

Patented Jan. 9, 1912.

4 SHEETS—SHEET 1.

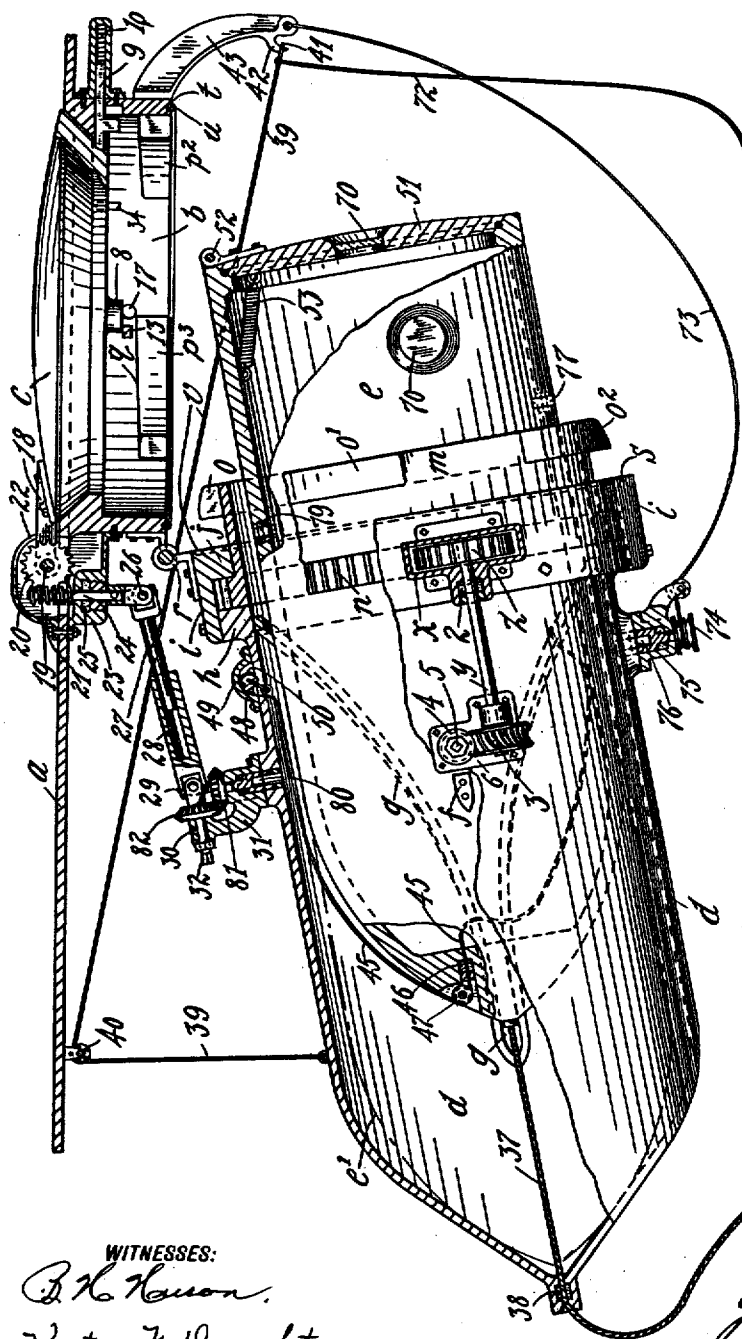


Fig. 1.

WITNESSES:
B. H. Hanson.
Kate F. Doughty.

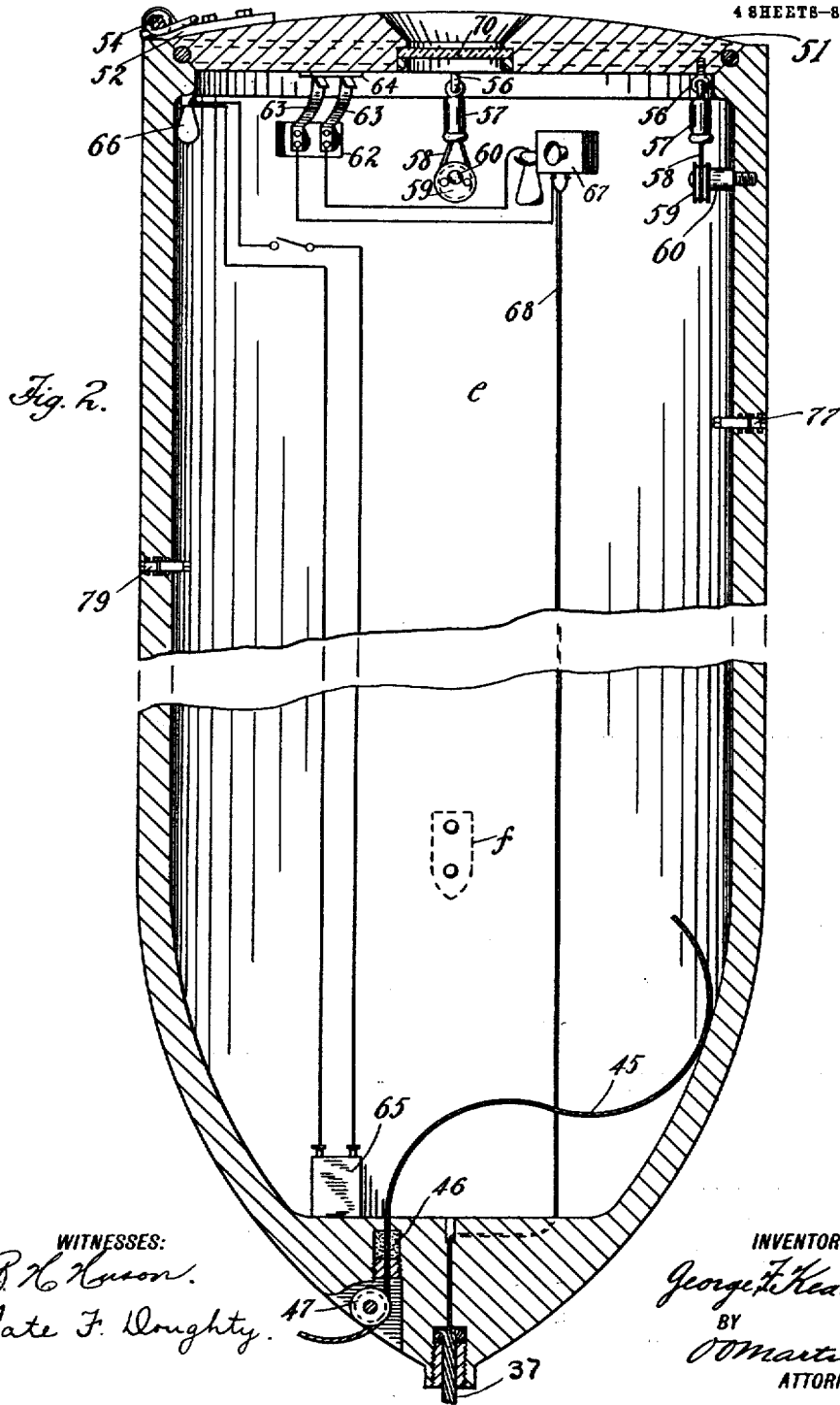
INVENTOR
George F. Keating.
 BY
O. O. Martin.
 ATTORNEY

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4 SHEETS—SHEET 3.

Fig. 3.

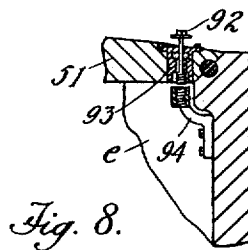
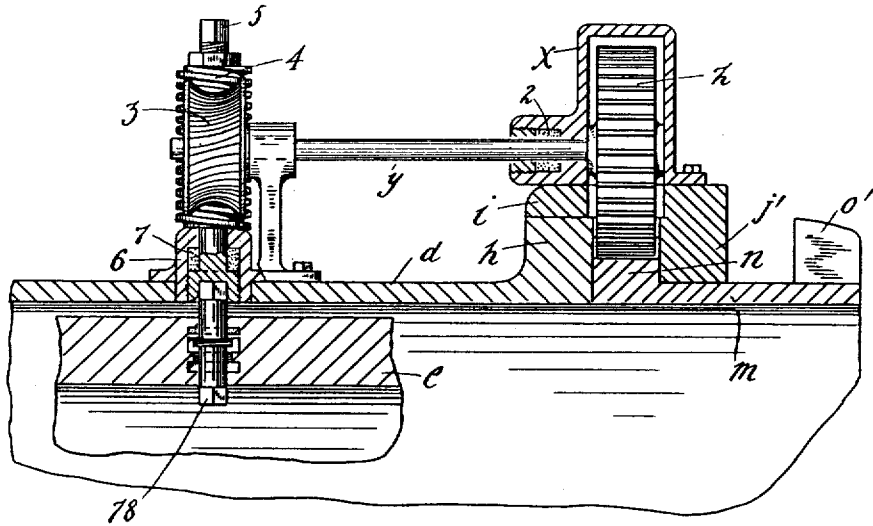


Fig. 8.

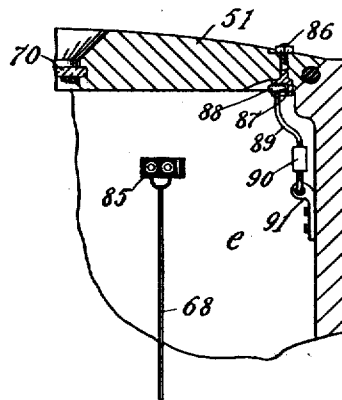


Fig. 9.

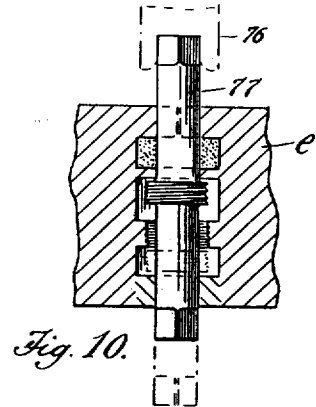
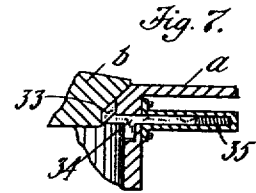
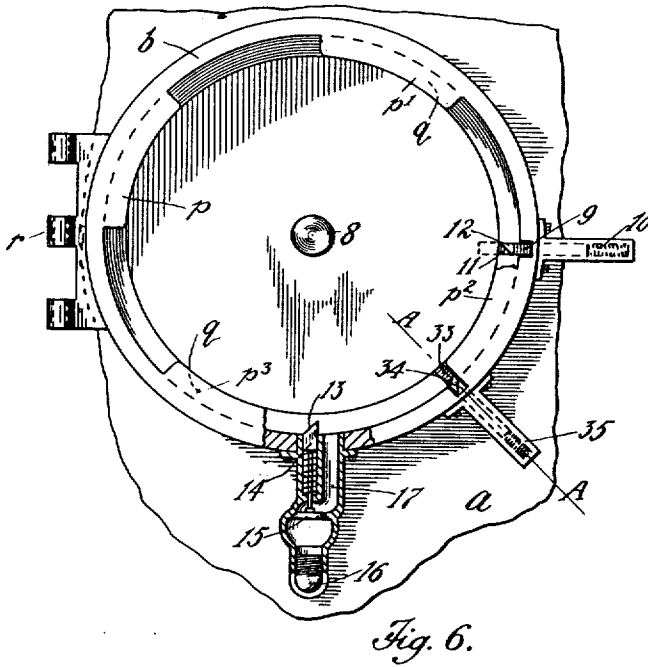
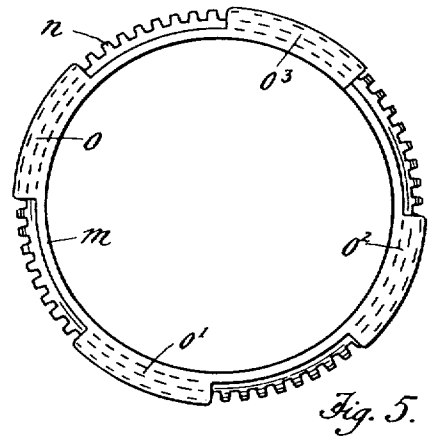
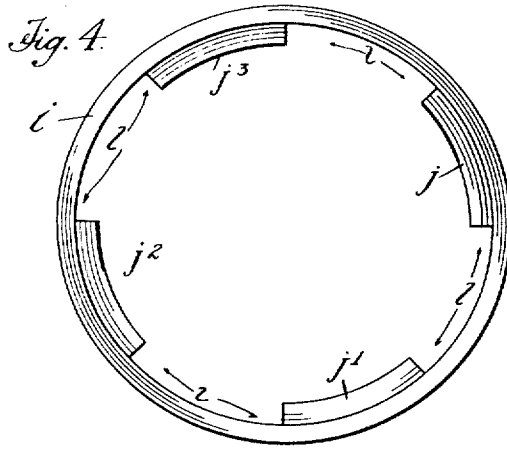
WITNESSES:
P. H. Hanson.
Kate F. Doughty.

INVENTOR
George F. Keating.
 BY
O. O. Martin.
 ATTORNEY

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WITNESSES:
B. H. Hanson.
Kate F. Doughty.

INVENTOR
George F. Keating.
 BY
O. O. Martin.
 ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE F. KEATING, OF PORTLAND, OREGON.

BUOY ATTACHMENT FOR SUBMARINE BOATS.

1,014,398.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed April 6, 1911. Serial No. 619,374.

To all whom it may concern:

Be it known that I, GEORGE F. KEATING, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Buoy Attachments for Submarine Boats, of which the following is a specification.

My invention relates to means for rescuing the crew of a submarine boat, in case the boat accidentally gets beyond the control of its crew and sinks to the bottom.

The object of my invention is to provide a device of the character mentioned, which normally may be stored away in a submarine boat, and which, in case of emergency, can be readily placed in operative position, to carry the crew, one at a time, safely to the surface of water.

A further object is to provide safety means to prevent the members of the crew from incorrectly operating my device to their own detriment.

Another object is to provide my device with additional operating means, whereby the last remaining member of the crew is able to extricate himself from the submerged boat, and to cause himself to be carried safely to the surface of the water.

These, and further objects of secondary importance, are clearly set forth in the following description and illustrated in the appended drawings, in which:

Figure 1 illustrates my device hinged to the deck of a submarine boat, substantially as it appears in operative position when ready to receive the man to be rescued, Fig. 2 is a sectional view on a larger scale of the barrel in which the man to be rescued is confined, Fig. 3 is a side elevation, partly in section of the operating mechanism shown in Fig. 1, Figs. 4 and 5 are plan views of details of the barrel casing shown in Fig. 1, Fig. 6 is a plan view of the cover mechanism in the deck of the boat, looking up from below deck, Fig. 7 is a sectional detail of Fig. 6, taken on line A A, Fig. 8 shows a means of locking the barrel lid from the outside, Fig. 9 shows another modified means of locking the barrel lid in place, and Fig. 10 is a detail view on a larger scale, showing a key operating means fixed in the wall of the barrel.

The deck *a* of the boat is provided with a cylindrical projection *b*, perforated and tightly fitted with a hinged cover *c*. On projection *b* journals a cylindrical casing *d*

adapted to receive a cylindrical barrel *e*, into which the man to be rescued enters, when the barrel is correctly seated in the casing. On the barrel are fixed, diametrically opposite, a pair of projections *f*, which, when the barrel is inserted, enter guides *g* of the casing, and, as said guides narrow down to the width of the projections, the barrel, when completely inserted, (as indicated by dotted line *e'* in Fig. 1), is positioned relative to the casing as required, in order to proceed with the operation of my device. Casing *d* is made with a shoulder *h*, to the outer periphery of which is bolted a cylindrical shell *i*, made with an inwardly projecting flange *j*. As shown in Fig. 4, said flange is composed of members *j*, *j'*, *j²*, *j³*, all of the same size and slightly shorter than the intermediate spaces *l*, in order that gear drum *m*, interposed between casing *d* and flange *j* may be readily inserted. Gear drum *m*, (see Fig. 5) is at one end made with a toothed shoulder *n* and at the opposite end with a series of flange members *o*, *o'*, *o²*, *o³*, identical with the members of flange *j*. The gear drum is first inserted in shell *i*, whereupon said shell is bolted to the casing. Integral with the inner surface of projection *b* are a series of flange members *p*, *p'*, *p²*, *p³*, of the same length and spacing as those of flanges *j* and *o*, but made with beveled top surfaces *q*. The casing is caused to swing on hinge *r* until face *s* of the casing abuts face *t* of projection *b*, during which motion flange *o* passes into projection *b*. Gear drum *m* is then rotated in the casing, causing flange members *o*, *o'*, *o²*, *o³*, to travel along bevel surfaces *q* until the casing is securely locked in place on deck projection *b*. A water-tight joint between the casing and deck projection is provided by fixing in an annular recess of face *t*, a rubber gasket *u*, which seats in an annular recess *v* of the abutting face *s*.

The mechanism for rotating gear drum *m* is shown in Figs. 1 and 3. In a water tight housing *x*, secured to shell *i* of the casing, journals a shaft *y* to which gear wheel *z*, meshing with the teeth of the drum, is secured. Suitable packings *2* prevent leakage of water from the housing. Rigid on the opposite end of shaft *y* is a worm wheel *3*, meshing with a worm *4*, the end of which is squared to receive a wrench or handle and which journals in a boss *6*, bolted to casing *d*, and provided with water tight packing *7*.

Cover *c* is normally held locked so that no water can penetrate into the boat. When the casing is seated on deck projection *b* by rotating the gear drum, said rotating motion is utilized to automatically unlock the cover and at the same time to open a valve, which permits water to enter the space between the barrel and the casing in order to relieve the outside pressure on the cover.

Referring to Figs. 1 and 6, 9 is a bolt, normally held projected, by a spring 10, into a pocket of cover *c*, thus locking said cover in place. As the flange member *o*¹ of the casing rotates forward along surface *g* of member *p*², it strikes, near the limit of its motion, the beveled face 11 of pendent member 12 of bolt 9, and draws the bolt out of the pocket in the cover. Member *o* simultaneously strikes bevel face 13 of a spring held bolt 14, causing a valve 15 to open and let water from the sea, which enters in any convenient manner through pipe 16, pass the valve and flow into the space between the barrel and the casing. The cover thus unlocked is raised by the mechanism shown in Fig. 1. Arm 18, hinge pin 19 and worm wheel 20 are all rigidly combined and the hinge pin journals in a housing 21 secured on top of the deck and provided with a slot 22 in which arm 18 is free to operate. Below the deck is mounted a second housing 23 in which a worm 24, meshing with worm wheel 20, is journaled and the bearing is provided with packing 25 to prevent water penetrating into the boat. Worm 24 is by universal joints 26, 29 and shaft 27 operatively connected with a shaft 30, journaled in a bracket 31, secured to the casing and made with a squared end 32 to which a wrench is applied for raising the cover *c*. Shaft 27 is slidably keyed in a socket 28 of universal joint 29, and the shaft is thus able to adjust itself to the position of the casing. The cover is now raised and, in rising, its projection 33 withdraws from a spring held bolt 34, mounted in a water tight housing 35 (see Fig. 7), thereby permitting said bolt to slide forward into the path of flange member *o*¹. The gear drum is thus locked against backward rotation, and cannot be rotated to disengage the casing *d* until the cover *c* is again closed. Cover *c* raised, the barrel is free to escape and its buoyancy carries it to the surface. A cable or rope 37 is attached to the bottom end of the barrel, and extends through a perforation in the casing, said perforation fitting with watertight packing 38. Said cable is of sufficient length to allow for the depth of water, when therefore, the man, on reaching the surface, has escaped from the barrel, the remaining crew of the boat pulls the barrel back into the casing by means of said cable, closes the cover, whereby the gear drum is unlocked, and rotates the gear drum to release the casing. A cable 39, extends from the casing over a pulley 40 pivotally secured to the deck, and by pulling on this cable, the casing is restored to its horizontal position, whereupon loop 41 of the cable is slipped onto a pendent hook 42 integral with a bracket 43 secured to deck projection *b* or suspended in any other suitable manner.

If the boat, in foundering, happens to turn over so that it rests on its side on the sea bottom, the barrel might not leave the casing on its own accord. The man in the barrel, in this case, pulls a cable 45, which extends through a watertight perforation 46 of the barrel bottom, over a pulley 47 and is hooked on to finger 48 of a watertight housing 49, secured to the casing. By referring to Fig. 1, it is readily seen that the cable, when given a quick pull, shoots the barrel out of the casing and then disengages itself from finger 48. A light spring 50 may conveniently be mounted in housing 49 to hold the cable against accidental disengagement.

While the barrel in its relation to the casing is shown in Fig. 1, Fig. 2 illustrates more clearly its construction, and in this view I have also shown additional features of importance. A circular lid 51 is by a hinge 52 journaled on the barrel; it is made to fit the mouth of the barrel tightly, and is held normally closed by a spring. In Fig. 1 I have, for the sake of clearness, shown a coil spring 53 suspended between the lid and the side wall of the barrel, but as this construction would interfere with the free actions of the man confined within the barrel, I prefer to wind the spring around the hinge pin of the lid, as shown by 54 in Fig. 2. To further lock the lid against accidental disengagement, I provide one or more latches, comprising an eye bolt 56, mounted in the lid, a turn buckle 57, loosely hung in said eye bolt and provided with a wire loop 58, adapted to engage a grooved eccentric disk 59. The latter is eccentrically pivoted to the wall of the barrel in any suitable manner as by a stud 60, and by applying a wrench to disk 59 the lid is drawn tightly onto the barrel. On an insulating base 62 I mount two contact springs 63, which, when the lid is closed, touch a contact plate 64 on the lid, and close the circuit of a telephone 67, which is mounted in the barrel to keep the man in communication with the crew in the boat, and the telephone cable 68 may conveniently be combined with the barrel hauling cable 37.

The barrel is furthermore provided with an electric light 66, energized by a battery 65, also with one or more windows 70, through which the man can follow the rotation of the gear drum and the action of cover *c*, before the barrel leaves the boat. After leaving the boat, the windows afford

the man an opportunity to look out for obstructions.

In the manner described all but one man have reached the surface. This remaining
 5 man, in the manner described, has returned my device to its initial position, substantially as shown in Fig. 1. He enters the barrel, grips the loose end 72 of cable 39 and pulls its loop 41 off the hook 42, there-
 10 by releasing the casing, which swings on its hinge, nearly to a vertical position. A cable 73 is attached to pendent bracket 43 of deck projection *b*, passes over a pulley and on to a drum 74, the axis of which journals
 15 in a watertight housing 75 secured to casing *d*, and extends through the wall of the casing. Said axis is made with a socket 76, into which a key 77, mounted in the wall of the barrel is caused to lodge. The man in
 20 the barrel applies a wrench to key 77 and pulls the casing tightly into the deck projection. Key 77 may be fixed in the barrel wall in any suitable manner, for example as shown in Fig. 8. As the spindle of worm
 25 4 of the gear drum rotating mechanism, (see Figs. 1 and 3) is made with a socket for receiving key 78 (similar to key 77 just described) of the barrel, the man in the barrel is able to rotate the gear drum and
 30 lock the casing on the deck projection. A boss or buffer 8, made of resilient material, is fixed on the bottom of the deck cover, and adapted to hold the barrel in place. It only remains for him to swing the deck
 35 cover, and in Fig. 1 it is readily seen, how he applies a wrench to key 79 (identical with keys 77 and 78), which enters socket 80, rotates bevel gears 81, 82 and shaft 27.

My device, while principally designed to
 40 save the life of the boat crew, lends itself equally as well to other purposes. The barrel can be fitted with compasses and other instruments, air storage, or ventilators, and all other necessities and conveniences, and
 45 as the center of gravity of the barrel is so computed, that the barrel always remains perpendicular, a man can be sent to the surface and remain there for an extended space of time for scouting purposes.

In Fig. 2 I have, to better illustrate the
 50 points of my invention, shown telephone instrument 67, and for interrupting the telephone circuit the switch 63, 64. A more practical method, however, is to attach the
 55 telephone cable 68 to a socket switch 85 (see Fig. 9). The person, before entering the barrel, attaches a telephone instrument to his head, in a manner well known, and, when desiring to communicate with the crew
 60 in the boat, inserts the plugs of the instrument in socket switch 85.

In Fig. 9 I also show a modified means of clamping lid 51 on the barrel. A bolt
 65 86 extends through the lid and has an enlarged head 87, into the socket of which

head 88 of a bolt 89 is caused to lodge. Bolt
 89 journals in a bracket 91, bolted to the wall of the barrel, and is provided with a turn buckle 90, by means of which the lid is
 drawn tight on the barrel. As bolt 86 ex- 70
 tends through the lid, the latter, in case the person confined in the barrel should be un-
 able to release himself, can be opened from the outside.

Should the person to be rescued be inca- 75
 pacitated before entering, the crew places him in the barrel and clamps the lid from the outside by means of bolt 92 shown in Fig. 8. Said bolt is mounted in a water
 tight casing 93 of the lid and is adapted to 80
 engage the screw threads of a bracket 94, bolted to the wall of the barrel.

I claim—

1. In a submarine boat in combination: a water tight barrel; a casing for said barrel 85
 hinged on the boat deck; a water tight cover hinged on the boat deck and normally locked in place; means for locking said casing tightly to the deck, said means so
 arranged that the locking of the casing re- 90
 leases the cover lock; means for rotating said cover on its hinge; means actuated by the raising of the cover for locking the casing against disengagement from the boat
 deck while the cover remains open; and 95
 means for controlling the operations of said casing and cover from inside the barrel.

2. In a submarine boat, in combination: a cylindrical casing, pivotally suspended
 from a cylindrical tubular projection of the 100
 boat deck; means for locking said casing tightly on the deck projection; a cover, hinged on the boat deck; means for rotating the cover on its hinge; a barrel or buoy
 adapted to lodge in said casing, the mouth 105
 of the barrel provided with a hinged, water tight lid, normally held closed by a spring mechanism; a cable attached to the bottom of the barrel, by means of which the barrel,
 after being carried to the surface by its 110
 buoyancy, is returned to its position within the casing; and means for operating the casing locking mechanism and the cover raising mechanism from the inside of the barrel. 115

3. In a submarine boat, in combination: a cylindrical casing, pivotally suspended from
 a cylindrical, tubular projection of the boat deck; a gear drum rotatably mounted in said casing and provided with flange members 120
 adapted to engage the beveled surfaces of flange members rigid on the inner wall of said deck projection and to lock the casing tightly on said deck projection; means for
 rotating said gear drum; a cover, hinged 125
 on the boat deck, tightly closing the mouth of said casing; means for rotating the cover on its hinge; a barrel or buoy adapted to lodge in said casing, the mouth of the barrel
 provided with a hinged, water tight lid, 130

normally held closed by a spring mechanism; a cable attached to the bottom of the barrel, by means of which the barrel, after being carried to the surface by its buoyancy, is returned to its position within the casing; and means for operating the casing locking mechanism and the cover raising mechanism from the inside of the barrel.

4. In a submarine boat, in combination: a cylindrical casing, pivotally suspended from a cylindrical, tubular projection of the boat deck; a gear drum rotatably mounted in said casing and provided with flange members adapted to engage the beveled surfaces of flange members rigid on the inner wall of said deck projection and to lock the casing tightly on said deck projection; means for rotating said gear drum; a cover, hinged on the boat deck, tightly closing the mouth of said casing; means for rotating the cover on its hinge; means for locking the cover against rotation on its hinge; means for releasing said cover lock by the rotation of the casing flange in engaging the flange of the deck projection; a spring held bolt, normally held retracted and inoperative by the closed cover, and free to slide into the path of the casing flange, when the cover is raised, thus locking the casing against disengagement; a barrel or buoy adapted to lodge in said casing, the mouth of the barrel provided with a hinged, water tight lid normally held closed by a spring mechanism; a cable attached to the bottom of the barrel, by means of which the barrel, after being carried to the surface by its buoyancy, is returned to its position within the casing; and means for operating the casing locking mechanism and the cover raising mechanism from the inside of the barrel.

5. In a submarine boat, in combination: a cylindrical casing, pivotally suspended from a cylindrical, tubular projection of the boat deck; a gear drum rotatably mounted in said casing and provided with flange members adapted to engage the beveled surfaces of flange members rigid on the inner wall of said deck projection and to lock the casing tightly on said deck projection; means for rotating said gear drum; a cover, hinged on the boat deck, tightly closing the mouth of said casing; means for rotating the cover on its hinge; a water valve, mounted in the wall of the deck projection normally held closed, and opened by the rotation of the casing flange in locking the casing in place; a barrel or buoy adapted to lodge in said casing, the mouth of the barrel provided with a hinge, water tight lid, normally held closed by a spring mechanism; a cable attached to the bottom of the barrel, by means of which the barrel, after being carried to the surface by its buoyancy, is returned to its position within the casing; and means for operating the casing locking mechanism and

the cover raising mechanism from the inside of the barrel.

6. In a submarine boat, in combination: a cylindrical casing, pivotally suspended from a cylindrical, tubular projection of the boat deck; a gear drum rotatably mounted in said casing and provided with flange members adapted to engage the beveled surfaces of flange members rigid on the inner wall of said deck projection and to lock the casing tightly on said deck projection; means for rotating said gear drum; a cover, hinged on the boat deck, tightly closing the mouth of said casing; means for rotating the cover on its hinge; means for locking the cover against rotation on its hinge; means for releasing said cover lock by the rotation of the casing flange in engaging the flange of the deck projection; a water valve, mounted in the wall of the deck projection normally held closed, and opened by the rotation of the casing flange in locking the casing in place; a spring held bolt, normally held retracted and inoperative by the closed cover, and free to slide into the path of the casing flange, when the cover is raised, thus locking the casing against disengagement; a barrel or buoy adapted to lodge in said casing, the mouth of the barrel provided with a hinged, water tight lid, normally held closed by a spring mechanism; a cable attached to the bottom of the barrel, by means of which the barrel, after being carried to the surface by its buoyancy, is returned to its position within the casing; and means for operating the casing locking mechanism and the cover raising mechanism from the inside of the barrel.

7. In a submarine boat, in combination: a cylindrical casing, pivotally suspended from a cylindrical, tubular projection of the boat deck; a gear drum rotatably mounted in said casing and provided with flange members adapted to engage the beveled surfaces of flange members rigid on the inner wall of said deck projection and to lock the casing tightly on said deck projection; means for rotating said gear drum; a cover, hinged on the boat deck, tightly closing the mouth of said casing; means for rotating the cover on its hinge; a spring held bolt locking the cover against rotation on its hinge and released by the rotation of the casing flange on the flange of the deck projection; a barrel or buoy adapted to lodge in said casing, the mouth of the barrel provided with a hinged, water tight lid, normally held closed by a spring mechanism; a cable attached to the bottom of the barrel, by means of which the barrel, after being carried to the surface by its buoyancy, is returned to its position within the casing; and means for operating the casing locking mechanism and the cover raising mechanism from the inside of the barrel.

8. In a submarine boat, in combination: a

- cylindrical casing, pivotally suspended from a cylindrical tubular projection of the boat deck; means for locking said casing tightly on the deck projection; a cover, hinged on the boat deck; means for rotating the cover on its hinge; a barrel or buoy adapted to lodge in said casing, the mouth of the barrel provided with a hinged, water tight lid, normally held closed by a spring mechanism; a cable attached to the bottom of the barrel, by means of which barrel, after being carried to the surface by its buoyancy, is returned to its position within the casing; and means for operating the casing locking mechanism and the cover raising mechanism from the inside of the barrel; guiding means to insure the correct positioning of the barrel in the casing; means for expelling the barrel from the casing by the person confined in the barrel; means for locking and unlocking the lid of the barrel either from the inside or outside; means for lighting the interior of the barrel; communicating means between the interior of the barrel and the interior of the boat; means for retaining the casing in horizontal position; and means for releasing the casing and swing it into its vertical position from the interior of the barrel.
9. In a submarine boat, in combination: a cylindrical casing, pivotally suspended from a cylindrical, tubular projection of the boat deck; means for locking said casing tightly on the deck projection; a cover, hinged on the boat deck; means for rotating the cover on its hinge; a barrel or buoy adapted to lodge in said casing, the mouth of the barrel provided with a hinged, water-tight lid, normally held closed by a spring mechanism; a cable attached to the bottom of the barrel, by means of which the barrel, after being carried to the surface by its buoyancy, is returned to its position within the casing; means for operating the casing locking mechanism and the cover raising mechanism from the inside of the barrel; guiding means to insure the correct positioning of the barrel in the casing; means for expelling the barrel from the casing by the person confined in the barrel; means for locking and unlocking the lid of the barrel either from the inside or outside; means for lighting the interior of the barrel; communicating means between the interior of the barrel and the interior of the boat; means for retaining the casing in horizontal position; and means for releasing the casing and swing it into its vertical position from the interior of the barrel.
- In testimony whereof I affix my signature in presence of two witnesses.
- GEORGE F. KEATING.
- Witnesses:
H. F. ADAMSON,
B. H. HUSON.

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