

Nov. 11, 1924.

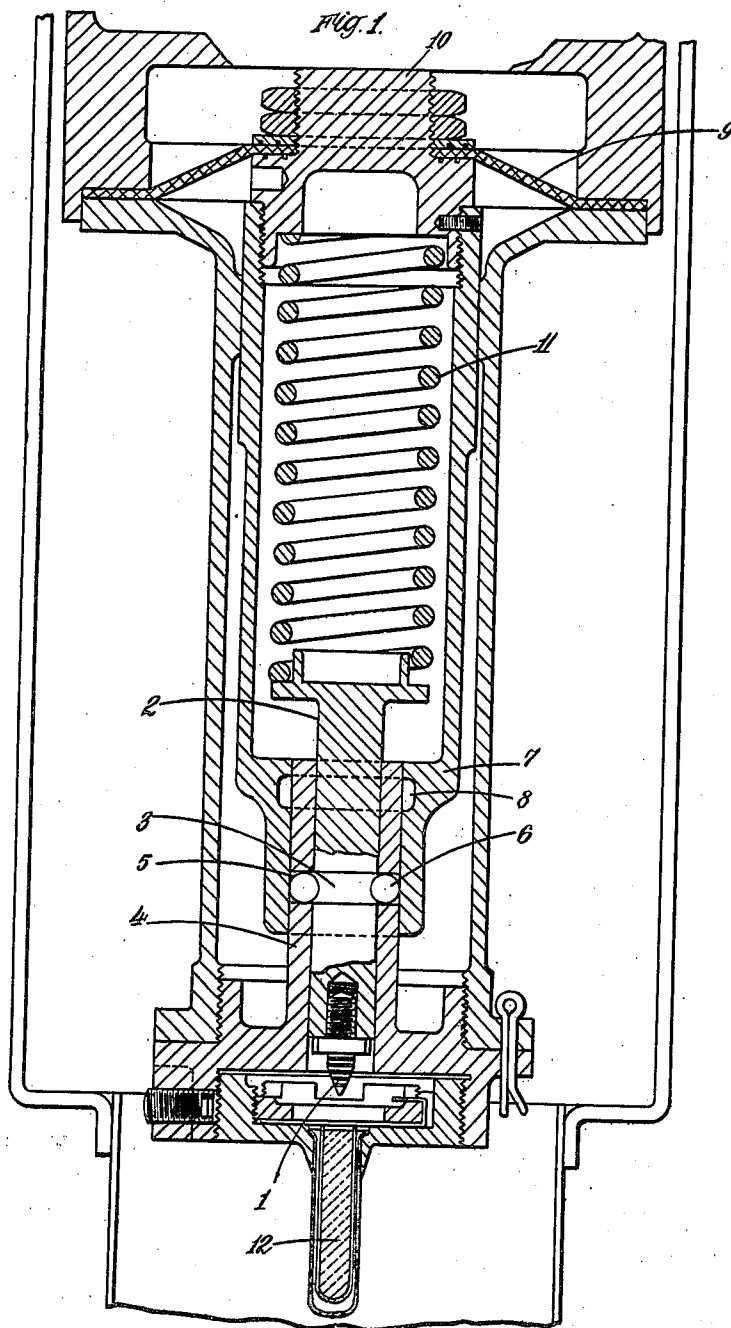
H. J. TAYLOR

1,514,743

SUBMARINE MINE AND OTHER EXPLOSIVE CHARGE FOR SUBMARINE USE

Filed July 19, 1921

2 Sheets-Sheet 1



Inventor

Hubert John Taylor

By

Pennie, Davis, Martin & Edwards
Attorneys

Nov. 11, 1924.

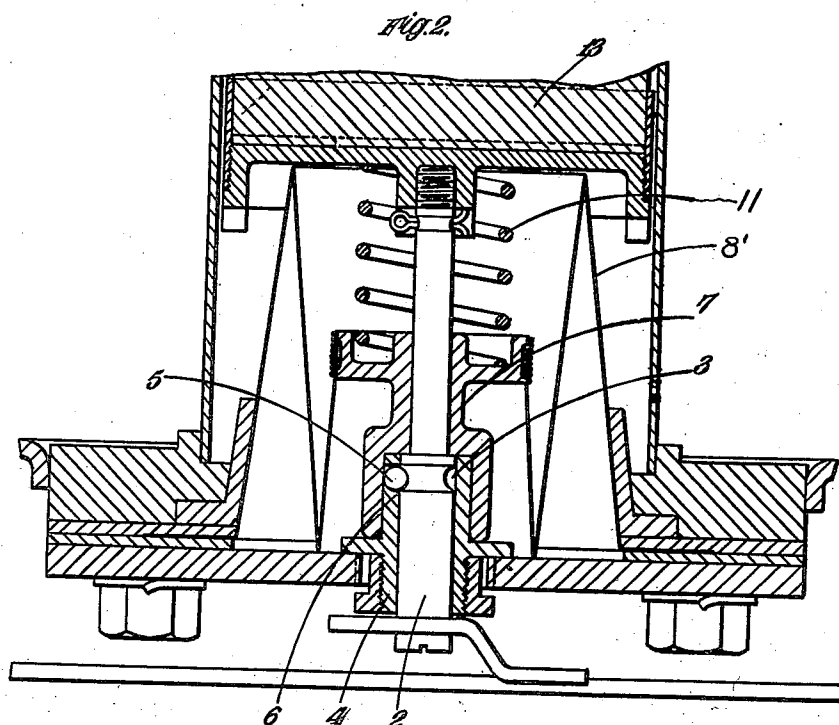
H. J. TAYLOR

1,514,743

SUBMARINE MINE AND OTHER EXPLOSIVE CHARGE FOR SUBMARINE USE

Filed July 19, 1921

2 Sheets-Sheet 2



Inventor

Herbert John Taylor

*B. P. Parnis, Paris, Maurice Chmonds
Attorneys*

UNITED STATES PATENT OFFICE.

HERBERT JOHN TAYLOR, OF PORTSMOUTH, ENGLAND, ASSIGNOR TO VICKERS LIMITED, OF WESTMINSTER, ENGLAND.

SUBMARINE MINE AND OTHER EXPLOSIVE CHARGE FOR SUBMARINE USE.

Application filed July 19, 1921. Serial No. 485,959.

To all whom it may concern:

Be it known that I, HERBERT JOHN TAYLOR, a subject of the King of Great Britain, residing at H. M. S. "Vernon," Portsmouth, England, have invented certain new and useful Improvements in and Relating to Submarine Mines and Other Explosive Charges for Submarine Use, of which the following is a specification.

10 This invention has for its object the provision of new or improved releasing devices for use with submarine mines, in which certain parts, such as for example of the pistol, or the primer and detonator, are to be retained in the inoperative position, until the mine has reached a set depth, or other set conditions have been fulfilled.

The present invention consists of a ball releasing device in conjunction with a hydrostatic diaphragm or piston or equivalent, the ball releasing device comprising three members and one or more balls holding two adjacent members together and retained in this position by a third member, the relative movement of which is effected by the hydrostatic controlled or other gear, to release one of the aforesaid two members, with or without simultaneously locking the third.

According to one construction, the device consists of a spindle attached to the part to be released and sliding into a fixed sleeve, over which a second sleeve slides. The fixed sleeve has holes in which one or more balls or pellets not necessarily spherical are placed. These balls or pellets project into a groove in the spindle and are prevented from falling out of this groove by the sliding sleeve. The sliding sleeve is acted upon through a diaphragm or piston by water pressure, and as it moves it compresses a spring against the spindle.

When a certain predetermined depth or pressure is reached, the inner bore of the sliding sleeve ceases to make contact with the balls, either by the provision of a groove, or otherwise, and allows them to be shot out of the groove in the spindle, which is now under spring compression and is suddenly released.

50 The same method may be applied but with the parts reversed, i. e., the outer sleeve may be attached to the part to be released and the spindle to the diaphragm or piston, or alternatively, the outer sleeve may be fixed

and the inner sleeve may slide carrying with it the spindle. 55

The construction above described is readily applied to a pistol such as is employed in mines or depth charges which are to be fired automatically at a certain depth. In this case the spindle carries the firing pin whereby the spindle is released or driven on to the detonator to fire the charge. Or it may be applied to safety gear where it is desired to keep one portion of the mechanism at a safe distance from another part until a certain depth in the water is reached, such as keeping the detonator away from the primer, or one electric contact from another. 70

Figures 1 and 2 of the accompanying drawings illustrate in vertical section the application of the device to the pistol of a depth charge or mine, and to a safety device for use with submarine mines in which the primer or detonator is moved to the firing position, only on the mine reaching a set depth. 75

Referring to Figure 1, the firing pin is secured by a spindle 2 provided with a groove 3 and mounted within a fixed sleeve 4, provided with through slots or recesses 5. Initially the spindle 2 and sleeve 4 are locked together by balls 6 engaging partly in the groove 3 and partly in the recesses 5. Slidably mounted on the fixed sleeve is an outer sleeve 7 which initially prevents the balls from leaving the slots 5, but which is provided with a groove, recesses or the like 8, at a suitable position along its length, into which the balls can pass when in line therewith, and so leave the groove in the spindle 2. 85

The outer sleeve 7 is connected to the diaphragm 9 of a hydrostat 10, the spring 11 of which is arranged to act upon the head of the spindle 2. 95

In operation, the diaphragm 9 as it is forced inwards by water pressure causes the outer sleeve 7 to move over the fixed sleeve 4 and at the same time compress the spring 11. During these operations the spindle 2 is locked to the fixed sleeve 4 by the ball 6. As soon as the sleeve 7 is in such a position that the groove 8 is in line with the balls 6, the outward pressure on the same forces them away from the spindle to the groove 8, the spindle being released and 105

driven inwards by the stored up energy of the spring 11 to cause the pin 1 to strike the detonator 12, to fire the charge of the mine in the usual manner.

5 Referring now to Figure 2 the primer 13 is supported on a spindle 2, provided with a groove 3, and mounted on a fixed sleeve 4, provided with through slots or recesses 5. The outer sleeve 7 in this case is acted on
10 by the hydrostat spring 11, and is connected to an extending diaphragm or like member 8'. In this case the outer sleeve 7 is moved along the fixed sleeve and the spindle 2, until its lower end just clears the ball
15 or balls 6, which thereupon fall away from the spindle and fixed sleeve to release the spindle, and consequently removes the restraint placed on the primer against moving towards the firing position relatively to
20 the detonator.

It is obvious that the movement effecting release may be of a rotational character instead of or in addition to being of a sliding character as above described, the relative
25 rotation of the parts bringing escape apertures into register with the balls to allow them to pass away to unlock one of the members previously locked.

Also the releasing gear may be applied to
30 the parts of submarine mines, other than those above referred to.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In submarine mines and other explosive
35 charges for submarine use a releasing or locking device comprising an inner member, a fixed intermediate member disposed around said inner member and provided with
40 displaceable locking means, a movable sleeve surrounding said intermediate member and normally holding said locking means in position, a hydrostatic diaphragm connected
45 to said sleeve, and a single spring which serves the combined function of holding said device in the locked position, and also supplying the minimum resistance which has to be overcome before the parts can move into the unlocked position.

2. In submarine mines and other explosive
50 charges for submarine use a releasing or locking device comprising an inner fixed member having a recessed part, a fixed intermediate member provided with a slot, laterally displaceable locking means in said slot
55 said locking means projecting into the recessed part in the inner member, a displaceable sleeve surrounding said intermediate member and normally holding said locking means in position, a hydrostatic diaphragm
60 connected to said sleeve and a single spring which serves the combined function of holding said device in the locked position, and also supplying the minimum resistance which has to be overcome before the parts
65 can move into the unlocked position.

3. In submarine mines and other explosive charges for submarine use a releasing or locking device comprising a spindle, a fixed sleeve surrounding said spindle, a slidable sleeve surrounding said first mentioned
70 sleeve, ball locking means disposed between said fixed sleeve and said spindle, said ball locking means being retained in position by the slidable sleeve, a hydrostatic diaphragm
75 connected to said sleeve and a single spring which serves the combined function of holding said device in the locked position, and also supplying the minimum resistance which has to be overcome before the parts
80 can move into the unlocked position.

4. In submarine mines and other explosive charges for submarine use a releasing or locking device comprising an inner member, a fixed intermediate member provided with
85 displaceable locking means which project into recesses in said inner member, a sliding sleeve surrounding said intermediate member and normally holding said locking means
90 in position, a hydrostatic diaphragm connected to said sleeve, and a single spring which serves the combined function of holding said device in the locked position, and also supplying the minimum resistance
95 which has to be overcome before the parts can move into the unlocked position.

5. In submarine mines and other explosive charges for submarine use a releasing or locking device comprising an inner member, a fixed intermediate member provided with
100 displaceable locking means which project into recesses in said inner member, a movable sleeve surrounding said intermediate member and normally holding said locking means in position, said movable sleeve being
105 provided with a recessed portion for the purpose specified, a hydrostatic diaphragm connected to said sleeve, and a single spring which serves the combined function of holding said device in the locked position, and
110 also supplying the minimum resistance which has to be overcome before the parts can move into the unlocked position.

6. In submarine mines and other explosive charges for submarine use a device for controlling the movement of the firing gear
115 comprising a spindle provided with a groove, a fixed sleeve surrounding said spindle and provided with a slot, balls located within said slot and projecting within said
120 groove, a movable sleeve disposed around said fixed sleeve and normally preventing the balls from leaving the said slot, a hydrostatic diaphragm connected to said sleeve, and a single spring which serves the combined function of holding said device in the
125 locked position, and also supplying the minimum resistance which has to be overcome before the parts can move into the unlocked position.

7. In submarine mines and other explosive 130

charges for submarine use a device for controlling the movement of the firing gear comprising a spindle provided with a groove, a fixed sleeve surrounding said spindle and provided with a slot, laterally displaceable locking means located within said slot and projecting within said groove, a movable sleeve disposed around said fixed sleeve and normally preventing the balls from leaving the said slot, said movable sleeve being provided with a grooved portion which is adapted to be brought into line with the slot in the fixed sleeve to allow the locking means to pass into said groove and thereby to release the spindle, a hydrostatic diaphragm connected to said sleeve,

and a single spring which serves the combined function of holding said device in the locked position, and also supplying the minimum resistance which has to be overcome before the parts can move into the unlocked position.

8. In submarine mines and other explosive charges for submarine use, a device for controlling the firing gear comprising a spring loaded firing pin, a fixed sleeve surrounding the pin and provided with displaceable locking means and a movable sleeve surrounding the fixed sleeve and normally holding the locking means in position.

HERBERT JOHN TAYLOR.