T. WRIGHTSON & J. M. RINGQUIST.

SUBMARINE MINE.

APPLICATION FILED AUG. 7, 1917.

1,298,141.

Patented Mar. 25, 1919.

2 SHEETS—SHEET 1.

Fig. 2.

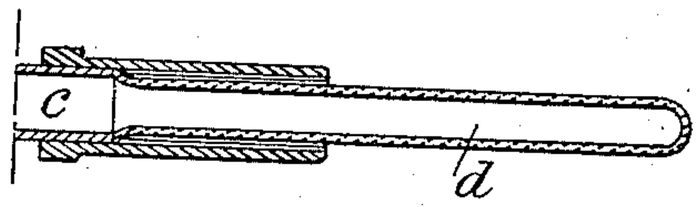

Fig. 1.

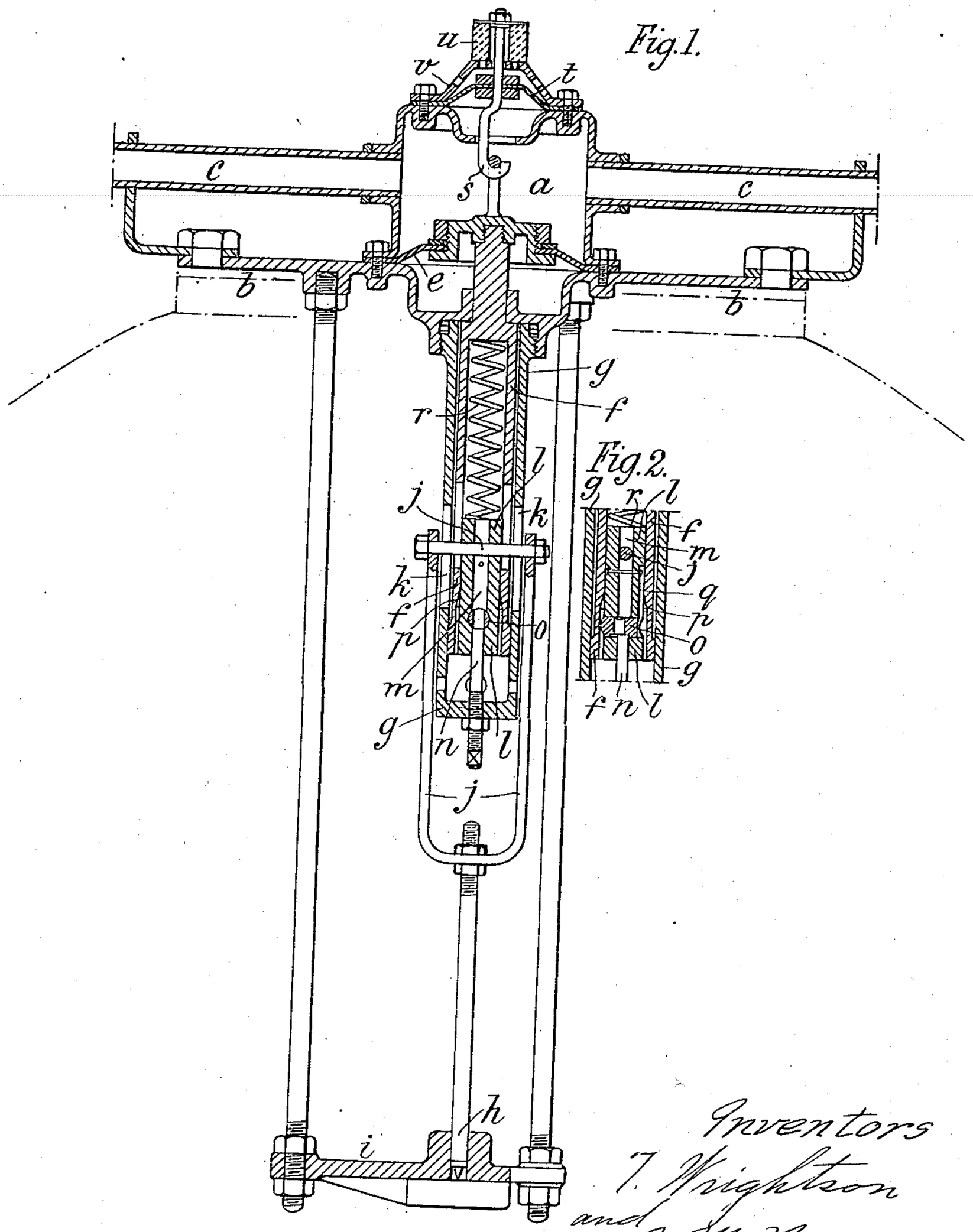

Fig. 2.

Inventors
T. Wrightson
and
J. M. Ringquist
by Baldwin & Wight

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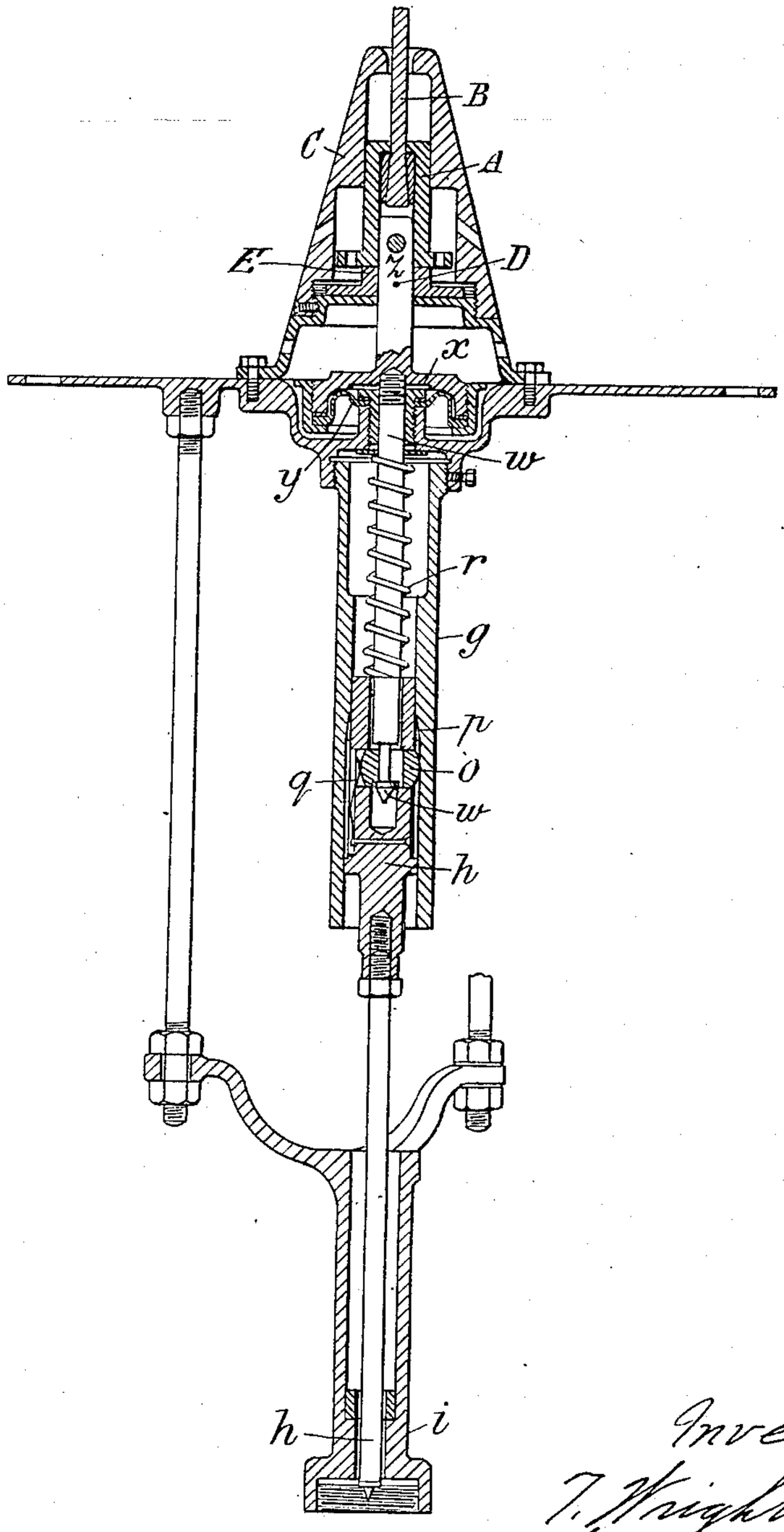
2 SHEETS—SHEET 2.

Fig. 3.



Inventors
T. Wrightson
and
J. M. Ringquist.
by
Baldwin & Wright

UNITED STATES PATENT OFFICE.

THOMAS WRIGHTSON AND JUSTUS M. RINGQUIST, OF THORNABY-ON-TEES, ENGLAND, ASSIGNORS TO HEAD, WRIGHTSON AND COMPANY, LIMITED, OF THORNABY-ON-TEES, ENGLAND.

SUBMARINE MINE.

1,298,141. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed August 7, 1917. Serial No. 184,860.

To all whom it may concern:

Be it known that we, Sir THOMAS WRIGHTSON, Bart., and JUSTUS MAGNUS RINGQUIST, subjects of the King of Great Britain, residing at Teesdale Iron Works, Thornaby-on-Tees, England, have invented a new and useful Improvement in Submarine Mines, of which the following is a specification.

The object of the present invention is to produce an improved and simplified form of firing gear and pistol for submarine mines of the type in which, upon a vessel striking the mine or pulling upon a rope attached thereto, a spring is first compressed and then allowed to expand to actuate a striker.

Our invention is illustrated by the accompanying drawings, Figure 1 of which is a section through the firing gear and pistol of a mine adapted to be fired on being struck by a ship, Fig. 2 being a section of part thereof at right angles to Fig. 1, while Fig. 3 is a section of a modified form adapted to be actuated by the pull of a rope or the like.

In Fig. 1, *a* is a chamber which is secured to a part *b* of the body of the mine; communicating with this chamber are two or more tubes *c* the outer ends of which are closed by antennæ *d* of glass. These last-mentioned devices are shown in section in Fig. 2 of the drawings. One side of the chamber is formed of a diaphragm *e* carrying a sleeve *f* adapted to move within a fixed guide *g*. *h* is the striker which is adapted to impinge upon a cap or primer carried by a stationary frame *i*. The striker is carried by a stirrup *j* the cross bar of which can slide in slots *k* in the guide *g*. On the cross bar is mounted a slider *l* having in it an axial hole *m* so that it can move upon a rod *n* carried by the guide *g*.

Normally, however, the slider cannot move, so that the striker cannot reach the cap, because a trigger *o* within the slider *l* rests upon the top of the rod *n*. An incline *p* is, however, provided in the interior of the sleeve *f* by which the trigger can be moved against a blade spring *q* (which normally holds it in place) so that a hole in the trigger comes into line with the rod *n* and therefore the slider can be moved over the rod by a spring *r* arranged within the sleeve.

In order that the mine may be safe until after it has been in the water a certain time, the sleeve may be held by a hook *s* carried by a second diaphragm *t* and kept in position by a block *u* of soluble material.

When the mine is placed in the water, the block *u* is dissolved and the pressure of the water entering through holes in a cap *v* moves the diaphragm *t* and therefore the hook *s* inward so that the sleeve *f* is freed.

Should a ship strike and break one of the antennæ shown in section in Fig. 2, water enters the chamber and forces the diaphragm *e* and the sleeve *f* inward, compressing the spring *r* between the sleeve and the slider *l* which is at first prevented from moving by the trigger *o* resting on the rod *n*. As the sleeve, however, continues to move inward, the incline *p* pushes the trigger inward until the hole in it comes opposite the rod *n*, whereupon the compressed spring forces the slider and stirrup inward, the striker impinges on the cap and the mine is fired.

In Fig. 3 the striker *h* moves as before in a fixed guide *g* and carries a trigger *o* against which the end of a firing rod *w* normally bears. The outer end of this rod is connected to a cap *x* containing a washer *y* to prevent ingress of water. The cap has on it a shank *z* fast with a stirrup A to which a wire rope B is made fast and which can move within a casing C secured to the mine. The firing rod is normally prevented from movement by a pin D which is secured to a block E within the casing and is adapted to be sheared by a certain pull.

The action is as follows:—

When a pull comes upon the rope, the pin D is sheared and the stirrup A moves outward drawing with it the cap *x* and therefore also the firing rod *w* and compressing the spring *r* by reason of the engagement with the inner end of the rod *w* of the trigger *o*; the striker *h* is also drawn outward until the incline *p* pushes the trigger *o* into such a position that it no longer engages the end of the rod *w*. The spring therefore is free to expand and moves the striker inward exploding the mine.

What we claim is:—

1. In a submarine mine pistol, the combination of a striker, a firing spring, means for compressing the spring, a trigger carried by the striker and having in it a hole, a fixed rod engaging the trigger and an incline adapted to move the trigger trans-

versely during the compression of the spring so as to bring the hole in the trigger into line with the rod.

2. In a submarine mine pistol, the combination of a striker, a firing spring, means for compressing the spring, a trigger adapted to prevent movement of the striker during the compression of the spring, an incline adapted to cause a transverse sliding movement of the trigger so as to free the striker and means actuated by the compression of the spring for moving the incline longitudinally.

3. In a submarine mine pistol, the combination of a striker, a slider with which it is connected, a sleeve in which the slider moves, a trigger mounted on the slider, means carried by the sleeve and engaging the trigger while in normal position, and devices carried by the sleeve for releasing the trigger and permitting the slider to operate the striker.

In testimony that we claim the foregoing as our invention, we have signed our names this 11th day of July, 1917.

THOMAS WRIGHTSON. [L. S.]
J. M. RINGQUIST. [L. S.]