

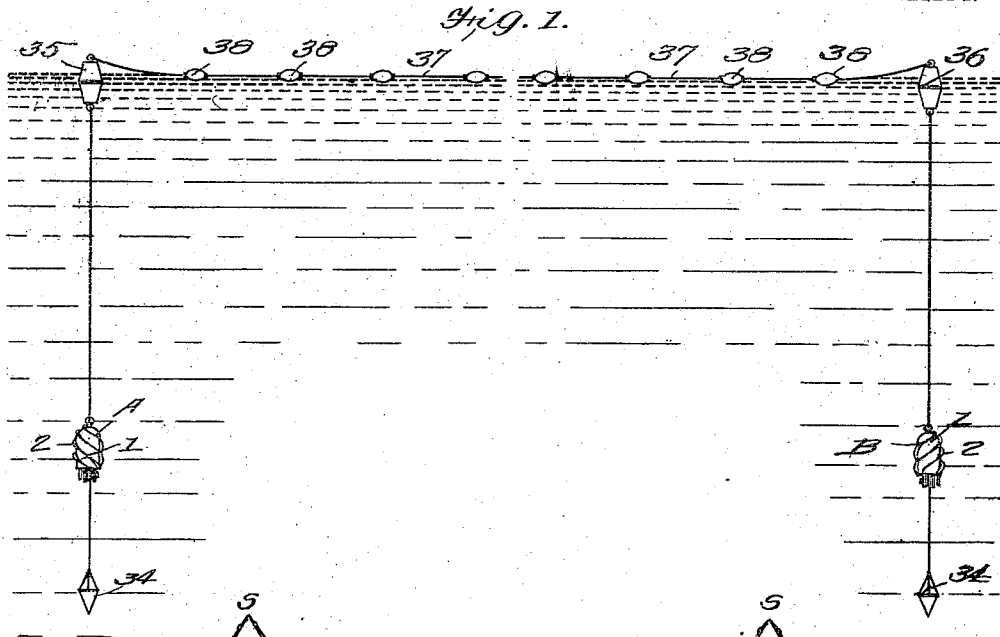
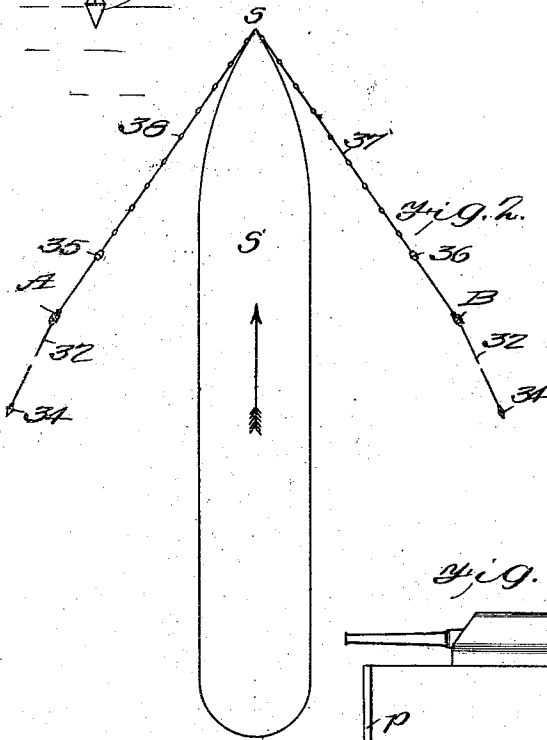
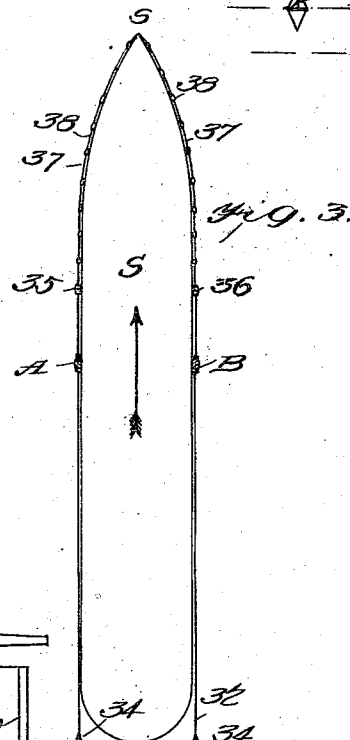
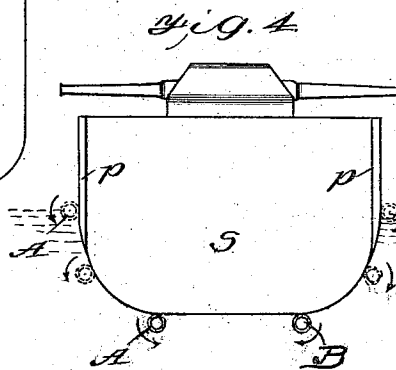
G. E. ELIA.
SUBMARINE MINE.

APPLICATION FILED JUNE 26, 1913.

1,092,702.

Patented Apr. 7, 1914.

3 SHEETS—SHEET 1.



WITNESSES
F. L. Barry
L. A. Stanley

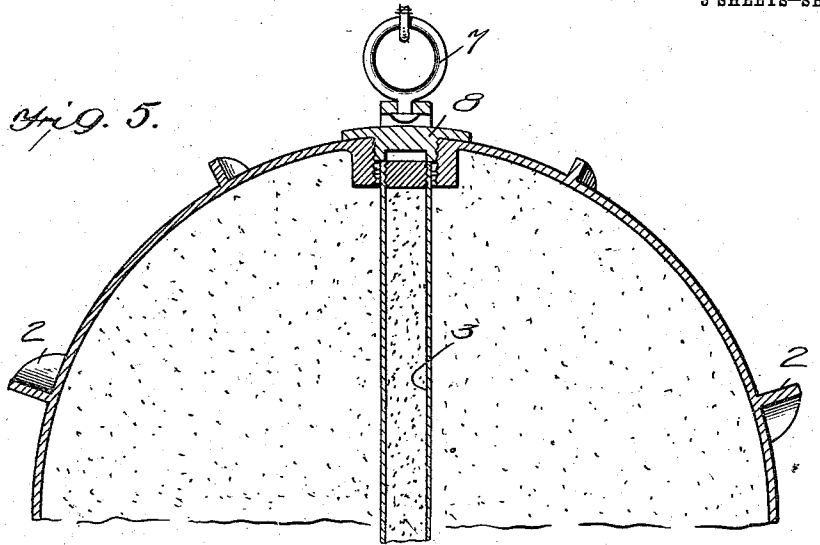
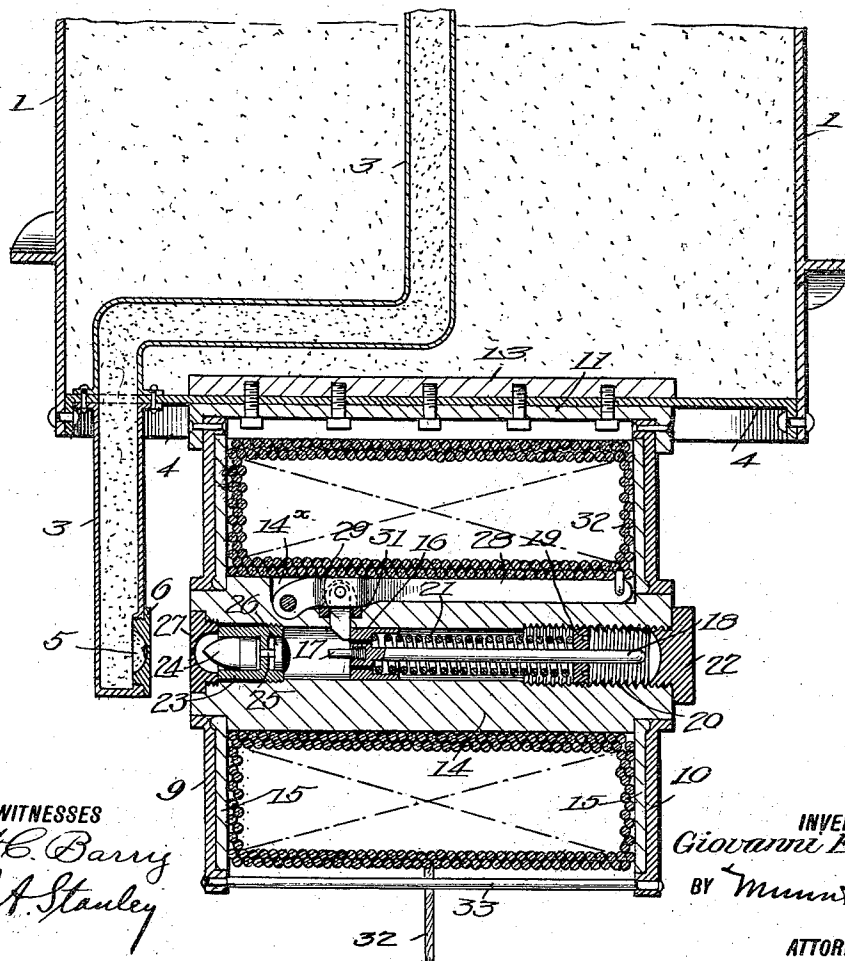
INVENTOR
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3 SHEETS-SHEET 2.



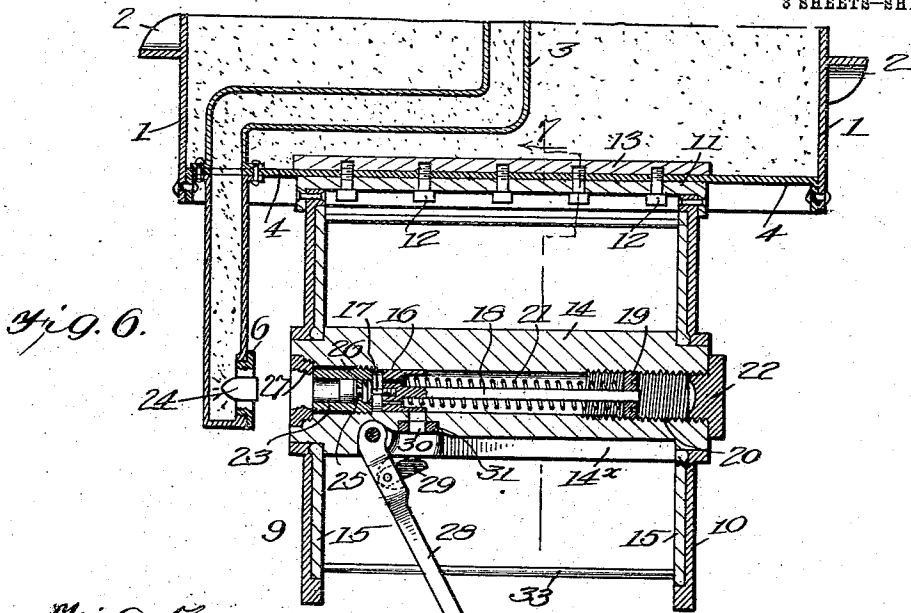
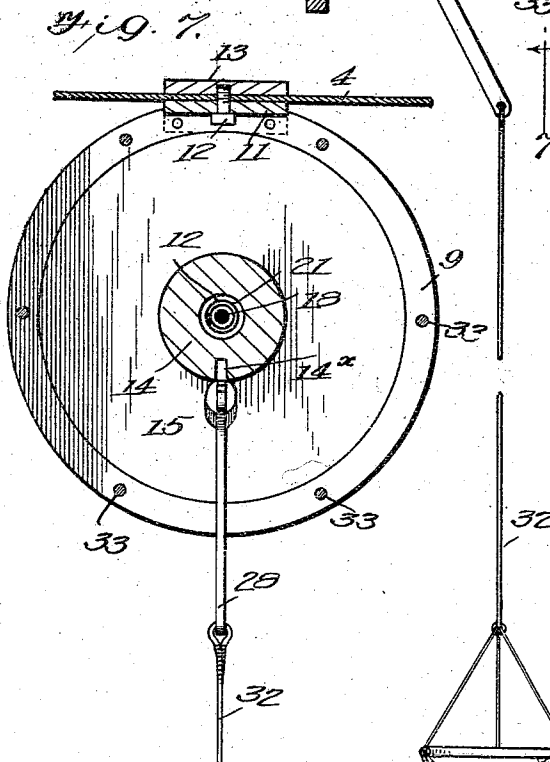
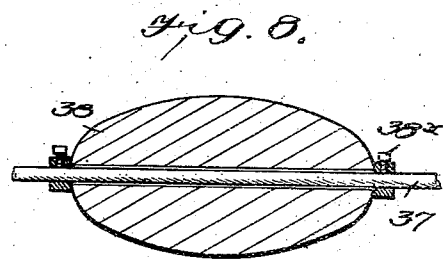
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

GIOVANNI EMANUELE ELIA, OF ROME, ITALY.

SUBMARINE MINE.

1,092,702.

Specification of Letters Patent

Patented Apr. 7, 1914.

Application filed June 26, 1913. Serial No. 775,878.

To all whom it may concern:

Be it known that I, GIOVANNI EMANUELE ELIA, a subject of the King of Italy, and a resident of Rome, Italy, have invented a new and Improved Submarine Mine, of which the following is a specification.

My invention relates to improvements in submarine mines, and it consists in the constructions, combinations and arrangements herein described and claimed.

An object of my invention is to provide a submarine mine of the floating type in which two mines, suspended from floats which are connected by an intermediate flexible connection, are caused to swing inwardly toward the sides of a ship when the latter engages the intermediate connection, with means carried by each of the mines for causing the latter to pass down underneath the outside armor plate to a more vulnerable part of the ship.

A further object of my invention is to provide means for causing the explosion of the mine when the latter has reached the vulnerable part of the ship, said means comprising a reel having a cable secured to a drag whose resistance to the water will cause the unwinding of the cable and the releasing of a trigger so as to permit a spring-pressed firing pin to be actuated thus resulting in the explosion.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming part of this application in which—

Figure 1 is a diagrammatic view showing the manner of floating the mines, Fig. 2 is a diagrammatic view showing a ship engaging the intermediate connections between the mines, Fig. 3 is a view similar to Fig. 2 showing the position of the mines after such engagement, Fig. 4 is a diagrammatic view showing the positions taken by the mines in moving from the armor covered portion of the vessel to the more vulnerable parts, Fig. 5 is a section through one of the mines, showing the attached reel in one position, Fig. 6 is a view similar to Fig. 5, showing the attached reel in another position, Fig. 7 is a section along the line 7—7 of Fig. 6, and Fig. 8 is a section through one of the cable supporting floats.

In carrying out my invention I provide

mines like that shown in Fig. 5. These comprise an exterior casing 1 having on the outside a series of spirally arranged flanges or blades 2 whose purpose will be explained hereinafter. This casing is designed to be filled with any suitable explosive.

Extending through the interior of the casing 1 from top to bottom is a tube 3, which is filled with detonating material. The bottom of this tube extends through the bottom 4 of the casing and is provided with a detonating cap 5 carried by a screw plug 6. At the top of the casing is a suspension ring 7 which is carried by a screw plug 8.

Referring now to Figs. 5 and 6 it will be seen that the two end plates 9 and 10 are secured to a plate 11 which is in turn secured to the bottom 4 of the casing 1 by means of bolts 12 which pass through the plate 11, the bottom 4 and into a plate 13 on the interior of the casing. The reel proper consists of a hub 14 having circular heads or end plates 15, which are set in angular recesses in the plates 9 and 10, and which are revoluble with respect thereto. The hub 14 is hollow and is provided with a piston 16 having a striking pin 17 on one side and being provided with a stem 18 on the other side. This stem extends through a guide plate or ring 19 which is adjustably mounted in a threaded portion 20 on the interior of the hub 14. A spring 21 bears at one end upon the adjustable ring 19 and at the other end upon the piston 16. A screw plug 22 is arranged to close one end of the hollow hub. Near the opposite end of the hollow hub is a cylinder 23 which contains a shell 24. It also contains a firing pin 25 which has a head 26 arranged to be engaged by the striking pin 17 for firing the shell 24. A screw cap 27 of soft metal closes this end of the hollow hub. The axis of this screw cap 27, as it will be observed, is coincident with the axis of the screw cap 6. On one side of the hub 14 is a longitudinal slot 14^x, in one end of which is pivotally mounted an arm 28 having a stop member 29 arranged to enter an opening 30 leading into the interior of the hollow hub 14. As will be seen from Fig. 5 the end of the stop member is disposed in the path of the piston 16. A gasket 31 is provided for the purpose of keeping out water from the interior of the hub. One end of the arm 28 is attached to a cable 32 which is wound around the reel in the manner shown in Fig. 5, and which passes out over a guide

bar 33. Secured to the cable 32 is a drag 34. The latter is preferably made in the shape of a hollow cone. In order to make these drags as near the density of water as possible and yet have them sink, I construct the drags of a light material such as canvas, so that when the mines are suspended by floats such as those shown at 35 and 36 in Fig. 1, the drags 34 will sink to a position immediately beneath the mines and yet will not exert sufficient force on the reel to cause it to unwind. It will be understood that when the mines are put overboard the cable between the drag 34 and the mine 1 is slack to permit the drag to reach its position without unwinding the reel.

From the foregoing description of the various parts of the device the operation thereof may be readily understood.

A pair of mines such as those shown at A and B in Fig. 1 are suspended from the floats 35 and 36. These floats are then connected by a cable or other flexible connection 37, which is in turn supported by small floats 38 of the shape shown in Fig. 8. These are provided with fastening devices 38* for securing the float to the cable. The cable 37 which connects the two floats 35 and 36 is arranged across the path (such as the entrance to the mouth of a stream or harbor) in which a vessel is presumed to pass.

It will be observed that the mine A is provided with spiral flanges 2, which are formed in the manner of a left-handed screw, while on the mine B the flanges 2 are formed like a right-handed screw.

Referring now to Fig. 2 it will be seen that when the prow of a ship or vessel S engages the cable 37 it will cause the mines A and B to swing inwardly toward the sides of the vessel. Immediately the drags 34 begin to exert a tension on the cord or cable 32. Eventually the mines A and B will strike the sides of the vessel as shown in Fig. 3. The first contact of the mines with the ship will be against the armor plate P of the latter, as shown in Fig. 4. Owing to the spirally arranged flanges 2 the mine A on one side and the mine B on the opposite side will be rotated in opposite directions by their passage through the water. This will tend to cause the mines to pass downwardly past the armor plate P and into contact with the under portion of the ship where it is more vulnerable. In the meantime the cable 32 is being unwound from the reels due to the force exerted by the drag. Now when the cable 32 has been completely unwound the arm 28 will be drawn outwardly in the manner shown in Fig. 6. This will withdraw the stop member 29 and permit the piston 16 to spring forward under the tension of the spring 21 so as to bring the striking pin 17 into engagement with the head 25 of the firing pin 25. The latter

will explode the shell 23 which will pass through the soft metal plug 27 and engage the detonating cap 5, thus firing the detonating material in the tube 3 and exploding the mine.

It will thus be seen that I have provided an arrangement by means of which mines which are separated by considerable distance may be brought into close contact with the sides of the ship above the vulnerable part and by the motion of the ship will be brought to the most vulnerable part and subsequently exploded.

I claim:

1. The combination with a pair of submarine mines, of a float for each mine, a flexible connection joining said floats, buoyant means for floating said flexible connection, said flexible connection being disposed in the path of a vessel and arranged to be engaged by the latter, whereby both mines are brought into engagement with the sides of the vessel, and means carried by each mine and operated by the forward movement of the vessel for subsequently moving the mine toward the bottom of the vessel.

2. The combination with a pair of submarine mines, of a float for each mine, a flexible connection joining said floats, buoyant means for floating said flexible connection, said flexible connection being disposed in the path of a vessel and arranged to be engaged by the latter, whereby both mines are brought into engagement with the sides of the vessel, means carried by each mine and operated by the forward movement of the vessel for subsequently moving the mine toward the bottom of the vessel, and means for subsequently exploding the mine.

3. The combination with a pair of submarine mines, of a float for each mine, a flexible connection joining said floats, buoyant means for floating said flexible connection, said flexible connection being disposed in the path of a vessel and arranged to be engaged by the latter, whereby both mines are brought into engagement with the sides of the vessel, means carried by each mine and operated by the forward movement of the vessel for subsequently moving the mine toward the bottom of the vessel, and means for subsequently exploding the mine, said last named means being operated by the movement of the vessel through the water.

4. In a submarine mine, a casing containing explosive material, a flexible connection with said casing arranged to be engaged by the prow of a vessel for drawing the casing forward through the water, and means carried by the exterior of the casing for rotating the latter during its movement through the water, thereby producing a rolling movement of the casing at right angles to its forward movement when the casing engages the side of the vessel.

5. In a submarine mine, a casing containing explosive material, a flexible connection with said casing arranged to be engaged by the prow of a vessel for drawing the casing forward through the water, and means carried by the exterior of the casing for rotating the latter during its movement through the water, thereby producing a rolling movement of the casing at right angles to its forward movement when the casing engages the side of the vessel, said last named means comprising a series of spirally arranged flanges secured to the casing.

6. The combination with a pair of submarine mines, of a float for each mine, a flexible connection joining said floats, buoyant means for floating said flexible connection, said flexible connection being disposed in the path of a vessel and arranged to be engaged by the latter, whereby both mines are brought into engagement with the sides of the vessel, means carried by each mine and operated by the forward movement of the vessel for subsequently moving the mine toward the bottom of the vessel, means for subsequently exploding the mine, said last named means comprising a detonating cap, a spring actuated striking pin, a trigger for releasing said spring actuated pin, a drag, and means actuated by the resistance of the drag in the water for releasing said spring actuated striking pin.

7. In a submarine mine, a casing, explosive material disposed therein, a tube disposed within said casing and having an extension outside of said casing, said tube being arranged to receive detonating material, a detonating cap carried by the extension of said tube, means carried by the exterior portion of said casing for firing said detonating cap, said last named means comprising a reel having a hollow hub, the axis of the hub being coincident with the axis of said detonating cap, a shell disposed within said hollow hub, means for protecting the shell from water, a spring-actuated striking pin disposed within said hollow hub, a trigger carried by the hub for releasing said spring-actuated pin, and means for operating said trigger.

8. In a submarine mine, a casing, explosive material disposed therein, a tube disposed within said casing and having an extension outside of said casing, said tube being arranged to receive detonating material, a detonating cap carried by the extension of said tube, means carried by the exterior portion of said casing for firing said detonating cap, said last named means comprising a reel having a hollow hub, the axis of the hub being coincident with the axis of said detonating cap, a shell disposed within said hollow hub, means for protecting the shell from water, a spring-actuated striking pin disposed within said hollow hub, a trigger car-

ried by the hub for releasing said spring-actuated pin, means for operating said trigger, said last named means comprising a flexible cable wound on said reel and arranged to engage the trigger, and means for unwinding said flexible cable.

9. The combination with a plurality of submarine mines, of a float for each mine, flexible means for connecting said floats, said flexible means being disposed in the path of a vessel, and the engagement of the flexible means by the vessel serving to bring the means into contact with the sides of the vessel, and means carried by the mines and operated by the movement of the vessel through the water for shifting the position of the mines toward the bottom of the vessel.

10. The combination with a plurality of submarine mines, of a float for each mine, flexible means for connecting said floats, said flexible means being disposed in the path of a vessel, and the engagement of the flexible means by the vessel serving to bring the means into contact with the sides of the vessel, and means carried by the mines and operated by the movement of the vessel through the water for shifting the position of the mines toward the bottom of the vessel, said last named means comprising spirally shaped flanges carried by the mines on the exterior portions thereof.

11. The combination with a plurality of submarine mines, of a float for each mine, flexible means for connecting said floats, said flexible means being disposed in the path of a vessel, and the engagement of the flexible means by the vessel serving to bring the means into contact with the sides of the vessel, means carried by the mines and operated by the movement of the vessel through the water for shifting the position of the mines toward the bottom of the vessel, said last named means comprising spirally shaped flanges carried by the mines on the exterior portions thereof, and means for exploding the mines after they have reached the bottom parts of the vessel.

12. The combination with a plurality of submarine mines, of a float for each mine, flexible means for connecting said floats, said flexible means being disposed in the path of a vessel, and the engagement of the flexible means by the vessel serving to bring the means into contact with the sides of the vessel, means carried by the mines and operated by the movement of the vessel through the water for shifting the position of the mines toward the bottom of the vessel, said last named means comprising spirally shaped flanges carried by the mines on the exterior portions thereof, means for exploding the mines after they have reached the bottom part of the vessel, said means comprising a reel carried by each mine, a cable carried by the reel, a trigger normally held

in an inoperative position by the cable and adapted to be released by the unwinding of the cable, and firing means brought into operation by the release of the trigger.

- 5 13. The combination with a plurality of submarine mines, of a float for each mine, flexible means for connecting said floats, said flexible means being disposed in the path of a vessel, and the engagement of the
10 flexible means by the vessel serving to bring the means into contact with the sides of the vessel, means carried by the mines and operated by the movement of the vessel through the water for shifting the position of the
15 mines toward the bottom of the vessel, said last named means comprising spirally shaped flanges carried by the mines on the

exterior portions thereof, means for exploding the mines after they have reached the bottom part of the vessel, said means comprising a reel carried by each mine, a cable carried by the reel, a trigger normally held in an inoperative position by the cable and adapted to be released by the unwinding of the cable, a drag attached to said cable for
25 causing the unwinding of the latter during the movement of the vessel through the water, and firing means brought into operation by the release of the trigger.

GIOVANNI EMANUELE ELIA.

Witnesses:

EDWARD H. SHERMAN,
ROSE HARDWICK.

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