E. SENGER & R. SAUTER.

MARINE MINE.

APPLICATION FILED FEB. 27, 1915.

1,154,272.

Patented Sept. 21, 1915.

2 SHEETS—SHEET 1.

Fig. 1

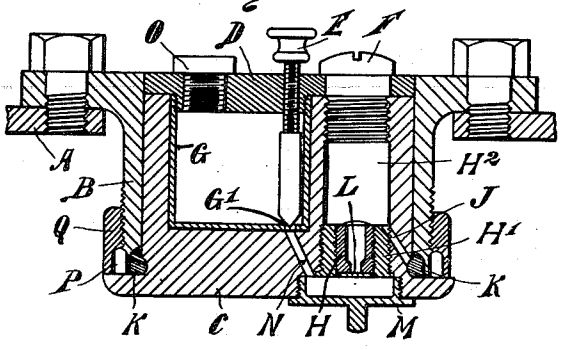


Fig. 6.

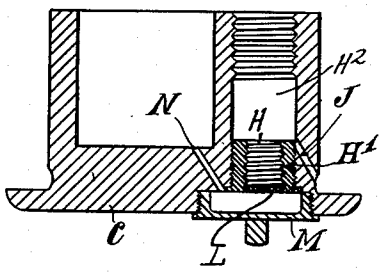


Fig. 3.

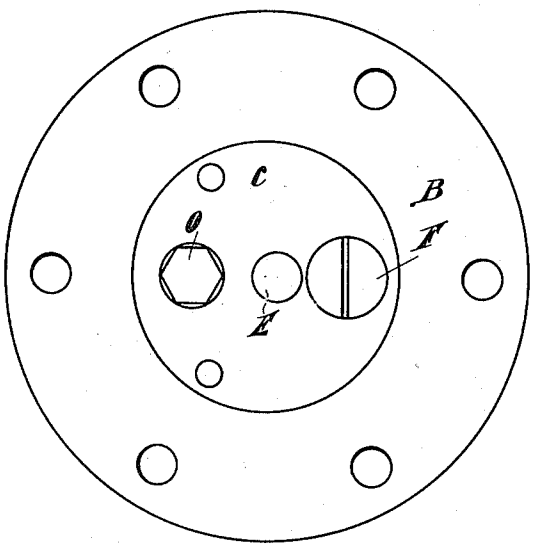
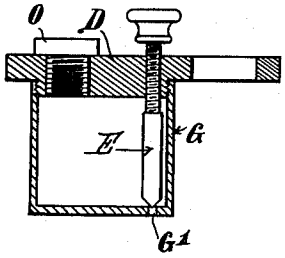


Fig. 5.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

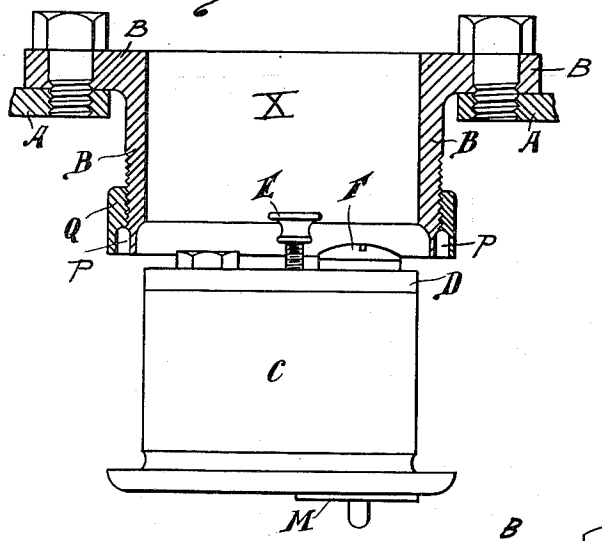


Fig. 7.

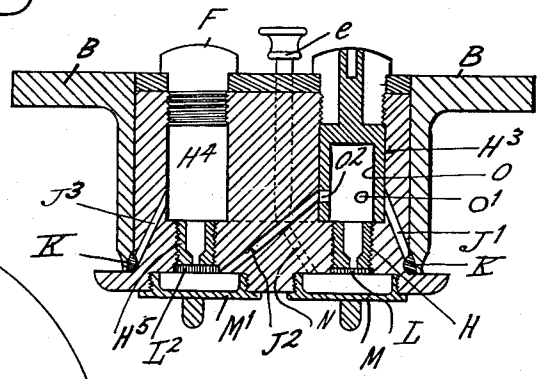
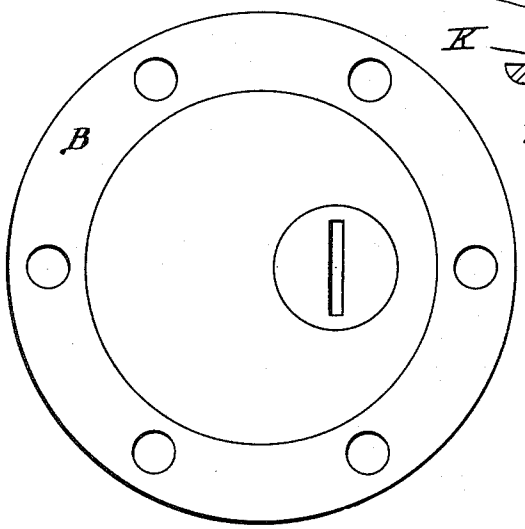


Fig. 4.



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UNITED STATES PATENT OFFICE.

EMIL SENGER AND RAIMUND SAUTER, OF LONDON, ENGLAND.

MARINE MINE.

1,154,272. Specification of Letters Patent. Patented Sept. 21, 1915.

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To all whom it may concern:

Be it known that we, EMIL SENGER and RAIMUND SAUTER, a citizen of the United States of America, and a subject of the German Empire, respectively, both residing at London, N. W., in England, have invented certain new and useful Improvements in Marine Mines, of which the following is a specification.

This invention relates to marine mines of that type which are provided with means including a soluble substance adapted under certain conditions or at a predetermined time to be dissolved and allow water to enter the mine case and cause the same to sink.

According to this invention we provide an apparatus, fitted preferably into the top of the mine case, which apparatus is completely released automatically from connection with the mine after a predetermined time, leaving a hole substantially equal to the diameter of said apparatus through which the water has a clear entrance into the mine case, thereby destroying its buoyancy and causing immediate sinking of the mine.

A practical embodiment of the invention is represented in the accompanying drawings, in which—

Figure 1 is a vertical section through a portion of the mine casing and the apparatus in question. Fig. 2 is a sectional elevation showing parts of the apparatus detached; Figs. 3 and 4 are plan views, Figs. 5 and 6 are sectional detail views of parts shown in Figs. 1 to 4, and Fig. 7 is a sectional view of a modification.

Within a cavity of the mine case A or within an annular flange B or equivalent forming an extension thereof, there is normally retained a casing C within which is a container G charged with mercury or other corrosive fluid. The casing C and container G are closed exteriorly by means of a cover D screwed into said container and provided with an aperture closed by a plug O, through which aperture the mercury or the like may be inserted into said container. The base or other suitable part of said container is provided with a small aperture G^1 adapted to register with a channel N in the casing C which communicates with a hollow plug M screwed into the casing and normally closed by a disk or diaphragm L of material (for example zinc or other soft metal) which will amalgamate with or be dissolved by the mercury when the same comes in contact therewith, so that the mercury can flow from the container G into the plug M and from the latter into a socket or plug H carrying said diaphragm L screwed into another plug H^1 inserted into a cylindrical cavity H^2 at one side of the casing, said space being closed by a screw cap F.

The passage through the aperture G^1 is controlled by a pointed valve E extending through the cover D so as to be manipulated from the exterior to allow the mercury to flow from the container to the channel N when desired.

The casing C is retained in the flange B or mine cavity by means of a ring of soft solder K, preferably melting at about 70° C., or some other similar form of connection which will be acted on by the mercury to quickly dissolve same and when this dissolution has taken place by the action of the mercury, which reaches same from the cavity H^2 through a channel J in the casing, the latter and all appurtenant parts will be released as shown in Fig. 2 to allow the surrounding water to enter the cavity X and cause the mine to sink.

A joint to retain the mercury until all the solder is dissolved is provided between the casing C and flange B by means of a ring Q screwed to said flange B, which also has a small cavity P to retain the mercury flowing through the solder until the apparatus is released.

The time during which the mine may be kept afloat after being laid is determined by the time required to dissolve the solder and by the thickness of the disk or diaphragm L which is acted on by the mercury, a longer or shorter time being required to cause amalgamation of this material with the mercury according to its thickness. As a modification for the lengthening of the possible time of flotation required, we may further provide additional cavities H^2 with separate soluble diaphragms of varying thickness, the mercury being admitted thereto through separate channels, each controlled from the outside of the mine by a valve which may be selected as desired before placing the mines in the water, as will be readily understood without illustration, and in addition for securing maximum length of time of flotation the mercury can be passed through all existing cavities in series by a connecting channel before the bulk of the mercury is admitted to the solder connection, for exa

ple, in Fig. 7 two cavities H^3, H^4 with soluble diaphragms L^1, L^2 are shown connected in series, one of said cavities containing a rotatable spigot O provided with two apertures O^1, O^2, and when the aperture O^1 coincides with channel J^1 mercury will flow through channel N into plug M, from the latter to socket H after dissolving the diaphragm, and from socket H into spigot O, from which it leaves by aperture O^1 into the channel J^1, whereby the mine will remain afloat for the minimum period, while if the spigot is turned as shown in the drawing to bring the aperture O^2 in coincidence with the channel J^2 the mercury will flow from said channel J^2 into plug M^1, from the latter into socket H^5 after dissolving diaphragm L^2, and from said socket into cavity H^4, from which latter it leaves by the channel J^3 to the solder connection K, thus permitting the mine to remain afloat for the maximum period. The remaining reference characters on this figure designate similar parts to those described with reference to Figs. 1 to 6.

What we claim as our invention and desire to secure by Letters Patent of the United States is:—

1. A marine mine having a cavity therein, a device within said cavity, a soluble connection between said mine and device, and means within said device for predetermining the time of destruction of said soluble connection, whereby the device is completely released from said cavity to permit entrance of water thereinto to destroy the buoyancy of the mine.

2. A marine mine having a cavity therein, a casing extending into said cavity, a soluble connection between said casing and mine, a container within said casing containing a solvent for said connection, means of communication between said container and the soluble connection, and means for controlling the time of passage of the solvent from the container to the connection.

3. A marine mine having a cavity therein, a casing extending into said cavity and having a channel, a soluble connection between said casing and mine, said casing adapted to contain a solvent for said connection, means for controlling the passage of solvent through said channel, and a soluble diaphragm between said channel and connection adapted to be acted on by the solvent.

4. A marine mine having a cavity therein, a casing extending into said cavity and having a channel, a soluble connection between said casing and mine, a container within said casing adapted to contain a solvent for said connection and provided with an aperture adapted to coincide with the channel in the casing, a valve for controlling the passage of solvent through said channel, a hollow plug communicating with said channel, a soluble diaphragm communicating with said plug, and means for conveying the solvent from said plug to the soluble connection when said diaphragm has been dissolved by said solvent.

5. A marine mine having a cavity therein, a casing extending into said cavity, a soluble connection between said casing and mine, the casing being adapted to contain a solvent for said connection, means of communication for said solvent between the casing and the soluble connection, and a soluble diaphragm normally obstructing the passage of the solvent through said means of communication.

6. A marine mine having a cavity therein, a casing extending into said cavity, a soluble connection between said casing and mine, the casing being adapted to contain a solvent for said connection, means of communication for said solvent between the casing and the soluble connection, a plurality of soluble diaphragms normally obstructing the passage of the solvent through said means of communication, and means whereby the solvent may be caused to act on one or more of said soluble diaphragms.

7. A marine mine having a cavity therein, a casing extending into and adapted to fill said cavity, a soluble connection between said casing and mine, means of communication between said casing and connection, a solvent within said casing capable of destroying said connection, manually operable means at the exterior of the mine for controlling said communication, and a detachable soluble diaphragm in said communication adapted to be acted on by the solvent to afford passage thereof to the connection whereby the latter is destroyed and the casing released from the mine to admit water thereinto to destroy its buoyancy.

In witness whereof we have signed this specification in the presence of two witnesses.

EMIL SENGER.
RAIMUND SAUTER.

Witnesses:
H. D. JAMESON,
O. J. WORTH.