

1,042,574.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 1.

Fig. 1

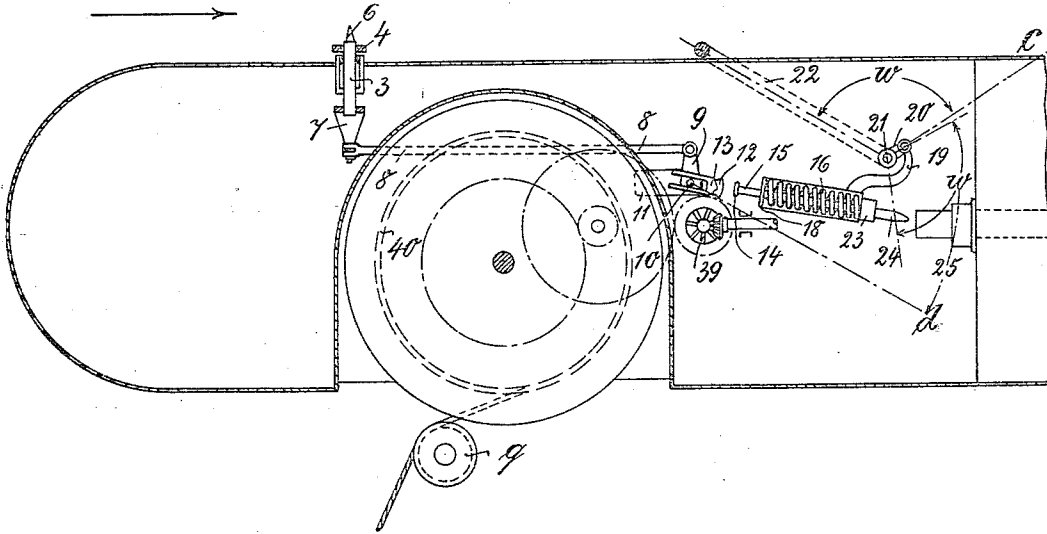
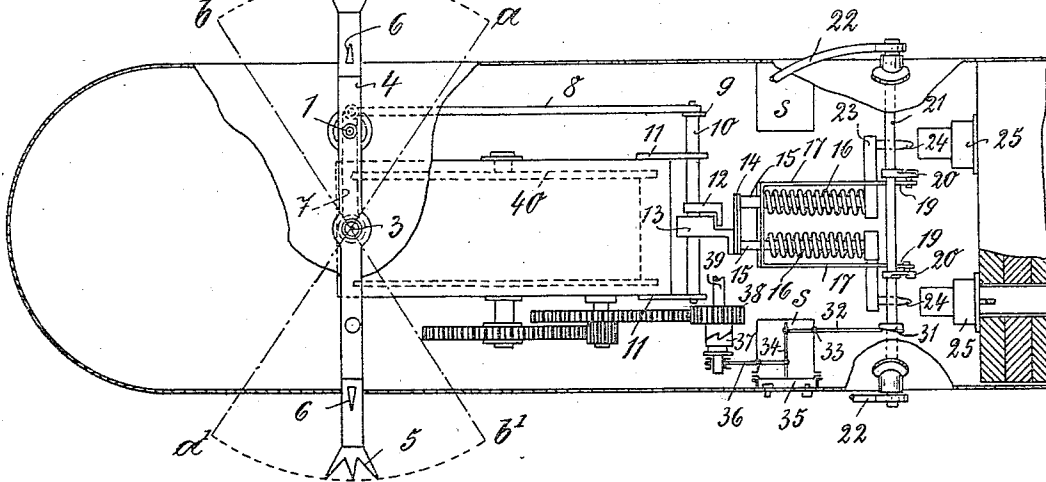


Fig. 2.



Witnesses:

L. Haskins
 O. S. Brown.

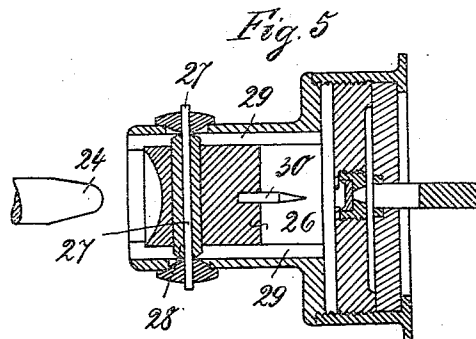
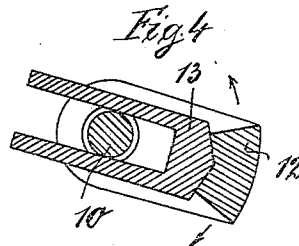
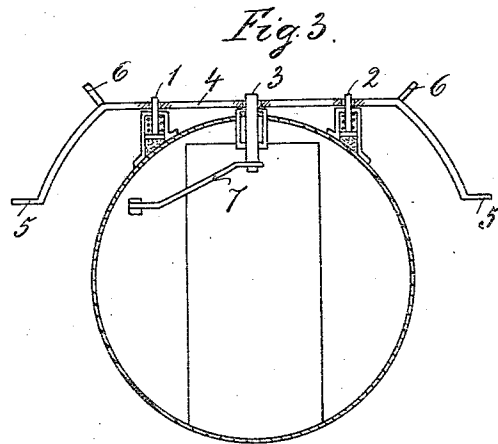
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A. LERNET.
 FLOATING MINE.
 APPLICATION FILED MAR. 28, 1912.

1,042,574.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ALEXANDER LERNET, OF VIENNA, AUSTRIA-HUNGARY.

FLOATING MINE.

1,042,574.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed March 28, 1912. Serial No. 686,734.

To all whom it may concern:

Be it known that I, ALEXANDER LERNET, a subject of the Emperor of Austria-Hungary, and resident of 9 Hamerling Platz, city of Vienna, Empire of Austria-Hungary, have invented certain new and useful improvements in Floating Mines, of which the following is a specification.

This invention relates to floating explosive mines for tidal waters and rivers of the type in which the ignition of the explosive charge is effected by means of percussion mechanism, and the present invention has for its object to render the percussive igniting mechanism inoperative, when required, and thus prevent unintentional ignition.

A further object of the invention is to facilitate the raising of the mine, this being effected simultaneously with the throwing out of gear of the ignition mechanism, the arrangement being such that, when the mine rises to the surface, evidence is afforded of the fact that the ignition mechanism has been rendered inoperative.

In order that the invention may be clearly understood, reference is made to the accompanying drawings, whereon I have shown my invention as applied to a floating mine of the type described in the specification of my prior United States Patent No. 995794.

Figure 1 is a fragmentary longitudinal section through the mine. Fig. 2 is a horizontal section through the mine, part being shown in plan. Fig. 3 is a transverse section. Fig. 4 is a detail view, showing the means for arresting the percussion mechanism, and Fig. 5 is a detail section view of the percussion cap.

The mine, which may be of any suitable shape, is adapted to be laid with its longitudinal axis parallel to the flow of the water current and to be adjusted as regards its depth below the water surface in the manner described in the specification of my aforesaid United States Letters Patent No. 995794 dated 20th June 1911, and is provided with means externally thereof, adapted to be struck by any vessel passing over the mine, said means comprising a balanced striking lever 4, which is preferably somewhat stirrup-shaped, as illustrated in Fig. 3, the balanced lever 4 being mounted on a pin 3 rotatable in a stuffing box in the upper side of the casing of the mine, said pin 3 being connected at its lower end to a lever 7, which is connected by means of a univer-

sal joint to a connecting rod 8 articulated to a crank 9 mounted upon a transverse shaft 10. The balanced lever 4 is capable of oscillating within the arcs *a*, *b*, *a'*, *b'*, indicated by dotted lines in Fig. 2, and is provided with outwardly directed points or projections 5 and 6 adapted to contact with the passing vessel.

The shaft 10 is rotatably mounted in suitable bearings 11 carried by the casing of the cable drum 40, and mounted midway on the shaft 10 is a cam 12 of L-shape, this cam 12 being normally adapted to arrest the movement of the percussion mechanism.

The percussion mechanism comprises a forked-shaped member 13 embracing the shaft 10 and adapted to engage the cam 12, the member 13 being carried by a yoke 14 connecting two parallel bars 15 carrying at their other ends the arms 23, from which project percussion pins 24. Surrounding the bars 15 are spiral springs 16 bearing at one end against the arms 23 and at the other ends against the bridge piece 18 of a stirrup 17, which also serves to guide the bars 16 during percussion. The stirrup 17 terminates rearwardly in upwardly directed arms 19 connected to cranks 20 mounted on a transverse shaft 21, which is rotatable in suitable bearings in stuffing boxes in the outer walls of the mine, and is connected at its outer ends to the two side-arms of a hoop or stirrup actuating lever 22.

The percussion pins 24 are normally in line with percussion caps 25 (see particularly Fig. 5), which are mounted on the shell inclosing the explosive material. Each percussion cap 25 carries a hammer 26 held in position by means of a soft copper pin 27 and prevented from rotation by means of a sleeve 28 mounted on the pin 27 and whose ends are guided in grooves 29 in the percussion cap. The forward end of the hammer 26 is dished out to receive the percussion pin 24 and carries at its rear end a percussion needle 30 adapted to strike the fulminating material.

In the position illustrated on the drawings the percussion mechanism is held in position against the action of the springs 16 and in operative relationship, this being rendered evident by the fact that the stirrup 22 is in its forward position, thus holding the percussion needles 24 in alinement with the hammer 26. The balanced lever 4 normally occupies the position illustrated in

full lines in Fig. 2, and on being turned in one direction or the other, the shaft 10 is rocked, thus rocking the cam 12 either upwardly or downwardly, as indicated by the arrows in Fig. 4, thereupon releasing the
 5 forked member 13 and bars 15, which under the action of the springs 16 causes the percussion pins 24 to effect the ignition of the explosive charge.

10 In order to manipulate the mine without danger, the ignition mechanism may be thrown out of gear by turning the stirrup lever 22 from the position illustrated in full lines in Fig. 1 to the position illustrated by
 15 the dotted line *c* in Fig. 1. By this means the shaft 21 and crank arms 20 are rocked through a corresponding angle *w*, whereupon the arms 19 and stirrup 17 are forced downwardly into the position illustrated by
 20 the dotted line *d* in Fig. 1 so as to be out of alinement with the percussion caps 25, while at the same time the forked-shaped member 13 is disengaged from the cam 12, thus releasing the spring 16 and forcing the per-
 25 cussion pins 24 into their outermost position. It will thus be seen that a double security is in this manner effected, the percussion pins 24 being moved out of aline-
 30 ment with the percussion caps 25 on the one hand and being released from the pressure of the springs 16 on the other hand, although it will be readily understood that it is only
 35 necessary that one of these operations be carried out in order to render the mine harmless. Means are furthermore provided for preventing oscillation of the balanced
 40 lever 4 prior to sinking the mine, said means comprising spring pins 1 and 2 (see Fig. 3) passing through corresponding
 45 openings in the balanced lever 4 and held in raised position by means of a suitable soluble substance *p*, so that on sinking the mine, the substance *p* dissolves and the spring
 pins 1 and 2 are moved downwardly out of engagement with the balanced lever 4.

In order to insure the greatest reliability in operation, the balanced lever 4 is ar-
 50 ranged as nearly as possible vertically over the cable guide pulley *q*, thus insuring the movement of the lever 4 and preventing the mine from moving away laterally from
 beneath the passing vessel, inasmuch as the resistance of the mine to the pressure of the
 55 passing vessel is greatest at this point, with the result that the balanced lever 4 is most easily capable of being turned, when mounted in this position. When the passing vessel
 60 approaches fore or aft of the mine, its longitudinal axis is parallel to or approxi-
 mately parallel to that of the mine, and the explosion can then only take place when
 the balanced lever 4 has been turned over the maximum amount, at which moment the
 65 explosive charge of the mine will be pressed against the broad side or bottom of the

vessel. If the passing vessel crosses the mine however in any other direction, or in the most extreme position at right angles to the longitudinal axis of the mine, the latter may
 70 not and cannot explode, but will be either pressed down below the bottom of the ship, where movement of the balanced lever 4 will
 be imparted thereto through the medium of the upper projections 6, or the mine will be
 75 forced laterally from the passing vessel and will then rise when lying alongside of the ship.

In order to facilitate the fishing up or raising of the mine, means are provided in combination with the mechanism for throw-
 80 ing the igniting means out of gear, whereby the mine may automatically rise and thus by its appearance on the surface of the water provide reliable evidence of the fact that the
 85 throwing out of gear has been effected, and the mine thus rendered harmless. For this purpose a cam 31 is fixed upon the trans-
 verse shaft 21, this cam engaging a double-
 90 armed lever 32 pivoted at 33, whose one end is articulated to a rod 34 connected to a diaphragm 35 and arranged within a hy-
 drostatic chamber *s* of the type described in my aforesaid prior patent specification. The rod 34 is articulated to a double-armed
 95 pivoted lever 36, by means of which the coupling 37 may be thrown into or out of en-
 gagement and the gear wheel 38 thus coupled or uncoupled to the main driving shaft 39,
 100 which is driven by any suitable source of power, the gear wheel 38 rotating the cable drum 40 through suitable gearing, the
 arrangement being such that when the coupling 37 is in engagement, the cable drum
 105 40 will be prevented from letting out the cable. On turning the stir-up-shaped lever 22 into the position illustrated by the dotted
 line *c* in Fig. 1, the cam 31 is rotated and actuates the pivoted lever 32 to move the rod
 34 and diaphragm 35 inwardly, whereupon the coupling 37 is disengaged and the cable
 110 drum 40 released to enable the cable to be paid out and thereby enable the mine to rise to the surface.

I claim:—

1. In a floating mine, an explosive charge,
 115 percussion caps thereon, percussion mechanism normally in alinement with said per-
 cussion caps, a pivotal axis about which said percussion mechanism is capable of oscil-
 120 lating, and means operatable from the exterior of the mine for oscillating said per-
 cussion mechanism to bring the same out of alinement with said percussion caps.
2. In a floating mine, an explosive charge,
 125 percussion caps thereon, percussion mechanism normally in alinement with said per-
 cussion caps, a spring tending to cause said percussion mechanism to effect percussion,
 130 arresting means for holding said percussion mechanism against the action of said spring,

a pivotal axis about which said percussion mechanism is capable of oscillating, and means operatable from the exterior of the mine for oscillating said percussion mechanism to bring the same out of alinement with said percussion caps, and for simultaneously releasing said percussion mechanism from said arresting means.

3. In a floating mine, an explosive charge, percussion caps thereon, a transverse bar, a forked member embracing said bar, percussion needles carried by said forked member and normally held in alinement with said percussion caps, a frame supporting said needles in position, springs intermediate said frame and needles, a transverse rotatable shaft, crank arms thereon connected to said frame and a lever exterior of the mine and mounted on said shaft for rotating the same to depress said frame.

4. In a floating mine, an explosive charge, percussion caps thereon, a transverse bar, a cam-shaped forked member embracing said bar, a cam cooperating with said forked member, percussion needles carried by said forked member and normally held in alinement with said percussion caps, a frame supporting said needles in position, springs intermediate said frame and needles, a transverse rotatable shaft, crank arms thereon connected to said frame, and a lever exterior of the mine mounted on said shaft for rotating the same to depress said frame, and simultaneously withdraw said forked member from cooperation with said cam.

5. In a floating mine, an explosive charge, percussion caps thereon, a transverse bar, a cam-shaped forked member embracing said bar, a cam cooperating with said forked member, percussion needles carried by said forked member, and normally held in alinement with said percussion caps, a frame supporting said needles in position, springs intermediate said frame and needles, a transverse rotatable shaft, crank arms thereon connected to said frame, a lever exterior of the mine and mounted on said shaft for rotating the same to depress said frame and simultaneously withdraw said forked member from cooperation with said cam, and means for independently operating said cam from the exterior of the mine to withdraw it from cooperation with said forked member.

6. In a floating mine, an explosive charge, percussion caps thereon, percussion mechanism

normally in alinement with said percussion caps, a spring tending to cause said percussion mechanism to effect percussion, arresting means for holding said percussion mechanism against the action of said spring, a pivotal axis about which said percussion mechanism is capable of oscillating, and means operatable from the exterior of the mine for oscillating said percussion mechanism to bring the same out of alinement with said percussion caps and for simultaneously releasing said percussion mechanism from said arresting means, a pivoted and balanced lever mounted on the mine in a position thereon where the mine offers the greatest resistance to movement, and a connection from said lever to said arresting means to independently release said percussion mechanism from said arresting means.

7. In a floating mine, an explosive charge, percussion caps thereon, percussion mechanism normally in alinement with said percussion caps, a pivoted axis about which said percussion mechanism is capable of oscillating, means operatable from the exterior of the mine for oscillating said percussion mechanism to bring the same out of alinement with said percussion caps, an anchor cable, a drum on which said cable is wound and means, simultaneously actuated on oscillating said percussion mechanism, to enable said drum to rotate and pay out cable and permit the mine to rise.

8. In a floating mine, an explosive charge, percussion caps thereon, percussion mechanism normally in alinement with said percussion caps, a pivotal axis about which said percussion mechanism is capable of oscillating, means operatable from the exterior of the mine for oscillating said percussion mechanism to bring the same out of alinement with said percussion caps, an anchor cable, a drum on which said cable is wound, driving means for rotating the drum to take up cable, a coupling intermediate said driving means and drum, and cam mechanism controlling said coupling and operated on the oscillation of said percussion mechanism to uncouple said drum from the driving means.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ALEXANDER LERNET.

Witnesses:

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HENRY HASPER.