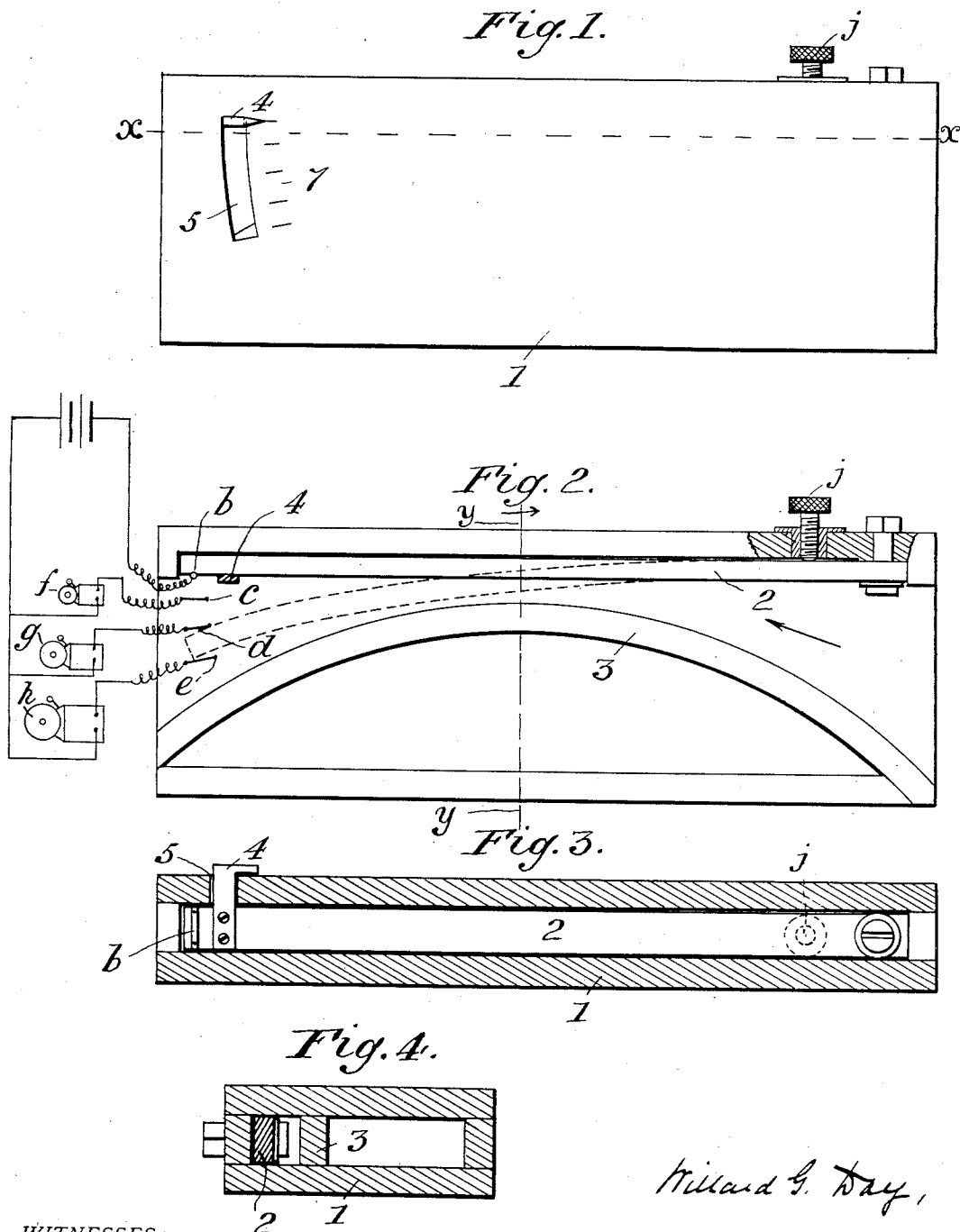


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 APPARATUS TO INDICATE THE PROXIMITY OF ICEBERGS AT SEA.
 APPLICATION FILED MAY 14, 1912.

1,057,807.

Patented Apr. 1, 1913.



WITNESSES
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UNITED STATES PATENT OFFICE.

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APPARATUS TO INDICATE THE PROXIMITY OF ICEBERGS AT SEA.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLARD G. DAY, a citizen of the United States, and resident of Baltimore, Maryland, have invented certain Improvements in Apparatus to Indicate the Proximity of Icebergs at Sea, of which the following is a specification.

The operation of the present invention is based on the well known fact that when one side only of a plate or strip of some flexible material such as metal or hard rubber, is suddenly subjected to a cooling medium, the plate will warp, and will not regain its original shape until the entire body is again brought to a uniform temperature. This property in materials is now availed of in an apparatus to sound an alarm on a vessel when the same is nearing an iceberg, as will hereinafter fully appear.

In the further description of the invention which follows, reference is made to the accompanying drawing forming a part hereof, and in which:

Figure 1 is a top view, or plan of the improved apparatus, and Fig. 2 a similar view except that a part of the apparatus is removed to disclose the interior. Fig. 3 is a section taken on the broken line $x-x$ in Fig. 1. Fig. 4 is a section taken on the broken line $y-y$ in Fig. 2.

Referring now to the drawing, 1 is a box formed preferably of some non-heat conducting substance such as wood, which is secured by suitable means, and in an exposed position, on a vessel, and with its forward end toward the bow.

The box 1 is open at its ends, and when the vessel is moving rapidly forward a current of air will pass through the box in the direction indicated by the arrow in Fig. 2.

Extending longitudinally in the box, and secured closely to one side thereof and at one end, is a straight strip 2, preferably of hard rubber; and between the said strip and the other side of the box is a partition 3 having an inclined and preferably a convex surface opposed to the strip 2. This partition serves to direct the current of air entering the box against the exposed or inner surface of the strip 2.

Fastened to the free end of the strip 2 is a metal plate b which together with three independent pins c , d and e , when the strip is sufficiently bent, will close an electric circuit in which there are bells f , g and h .

A nice adjustment of the strip 2 with respect to the pins c , d and e can be effected by means of the screw j .

Supposing the strip 2 to have a uniform temperature throughout its mass and in consequence is straight, as shown by its full delineation in Fig. 2, and the ship were to suddenly enter a body of air which due to the proximity of ice would have a temperature considerably lower than that of the strip 2, the air forced by the velocity of the vessel through the box 1 would cool the exposed surface of the strip 2 and before the strip could be equally chilled throughout its mass, it would buckle or rather, be inwardly curved as shown by its dotted delineations in Fig. 2; and the plate b coming in contact with the pin c , the first electric circuit would be closed and the bell f therein sounded. In the continued advance of the vessel, and a further reduction in the temperature of the air, the other pins d and e would be successively brought into the closed circuit, and the second and third bells g and h be sounded and indicate increasing danger. The sound of the first bell would cause the officers of the ship to take such measures as would be necessary under the circumstances to prevent accident by the ship's coming into collision with the ice. Although I have shown means whereby three bells or gongs would be sounded one after the other, or in succession, it is not necessary that more than one circuit should be employed, as the further lowering of the temperature would serve to continue the alarm; and the only advantage gained by a multiplicity of alarms would be an increase in the sound, as the danger became greater.

If desired, a visual signal can also be employed, and this could be arranged by providing the strip 2 with a pointer 4 arranged to protrude through the slot 5 in the top of the box, together with a scale 7 as shown.

I have described and shown what appears to me to be the simplest form of the instrument to accomplish the purpose in view, but it is evident that many variations in the construction of the apparatus can be made without departing from the principle involved.

I claim as my invention:—

1. In an apparatus for the purpose described, a flexible strip having an exposed and a protected side, combined with means

to direct air to the exposed side of the strip, and a device which in the deflection of the strip becomes operative to produce an alarm, substantially as specified.

- 5 2. In an apparatus for the purpose described, a box open at its ends, a flexible strip within the box and adjacent to one of its sides to which one end of the strip is secured, a metallic contact plate on the
10 free end of the said strip, and a second contact in an electric circuit containing a bell, combined with a deflector in the box whereby air passing through the box will be directed to the exposed surface of the said
15 strip, substantially as specified.

3. In an apparatus for the purpose de-

scribed, a box open at its ends, a hard rubber strip within the box and adjacent to one of its sides to which one end of the strip is secured, a metallic contact plate on the 20 free end of the rubber strip, and a second contact in an open electric circuit containing a bell, combined with a deflector in the box whereby air passing through the box will be directed to the exposed surface of 25 the said strip, and a visual indicator which is actuated by the bending of the strip, substantially as specified.

WILLARD G. DAY.

Witnesses:

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