

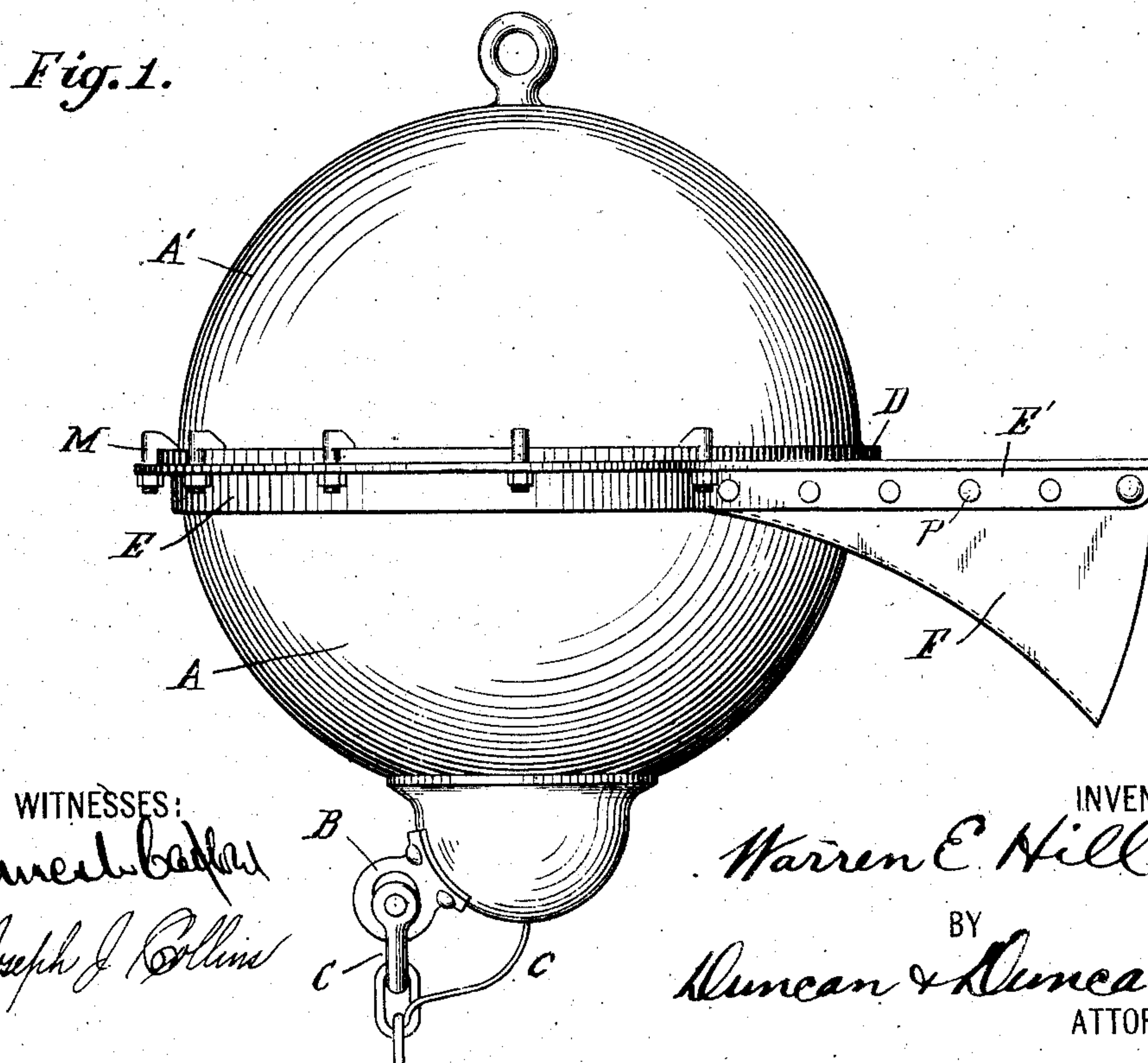
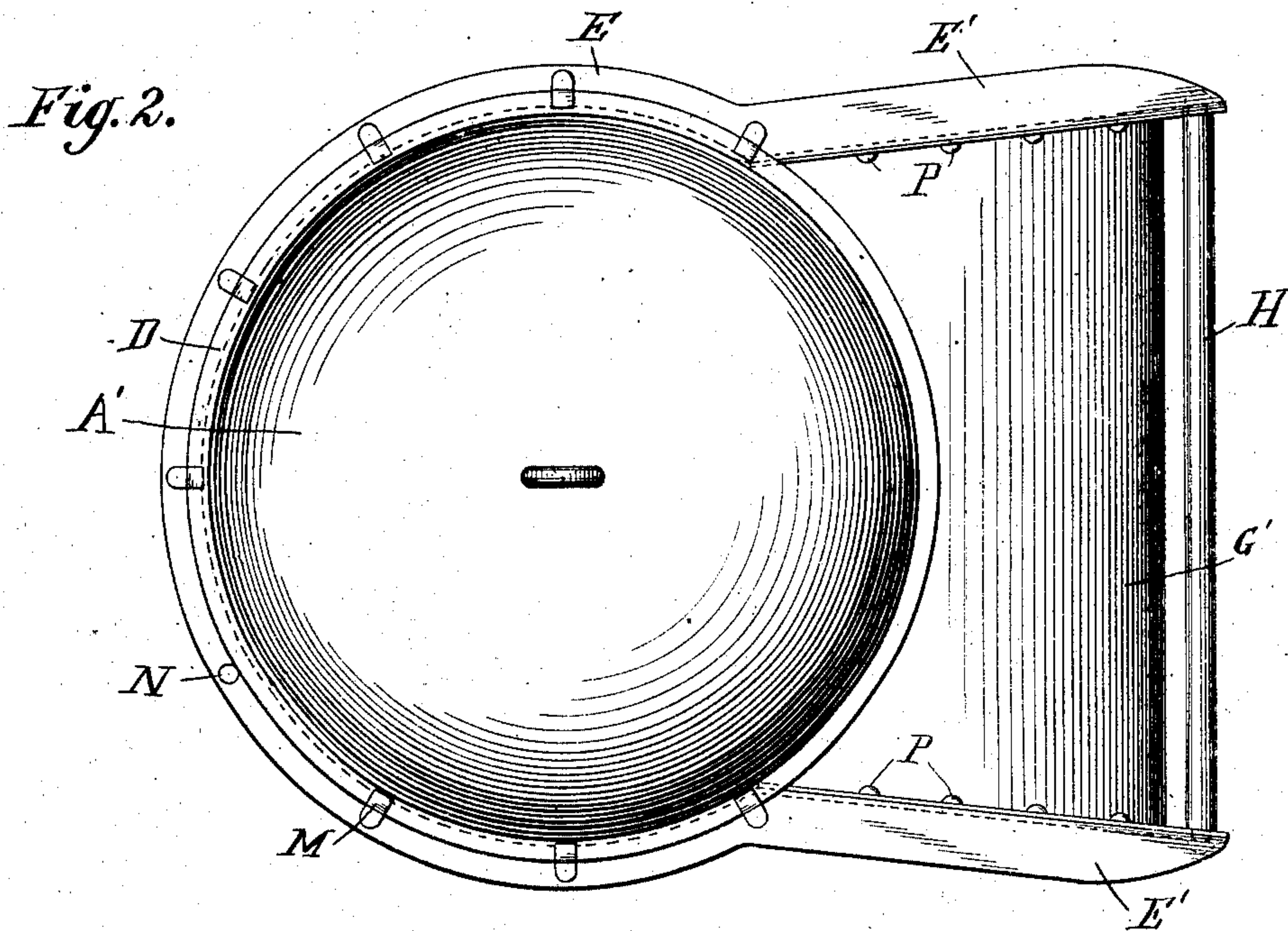
No. 846,567.

PATENTED MAR. 12, 1907.

W. E. HILL.
BUOY, TORPEDO, AND SIMILAR DEVICE.

APPLICATION FILED MAY 31, 1905.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

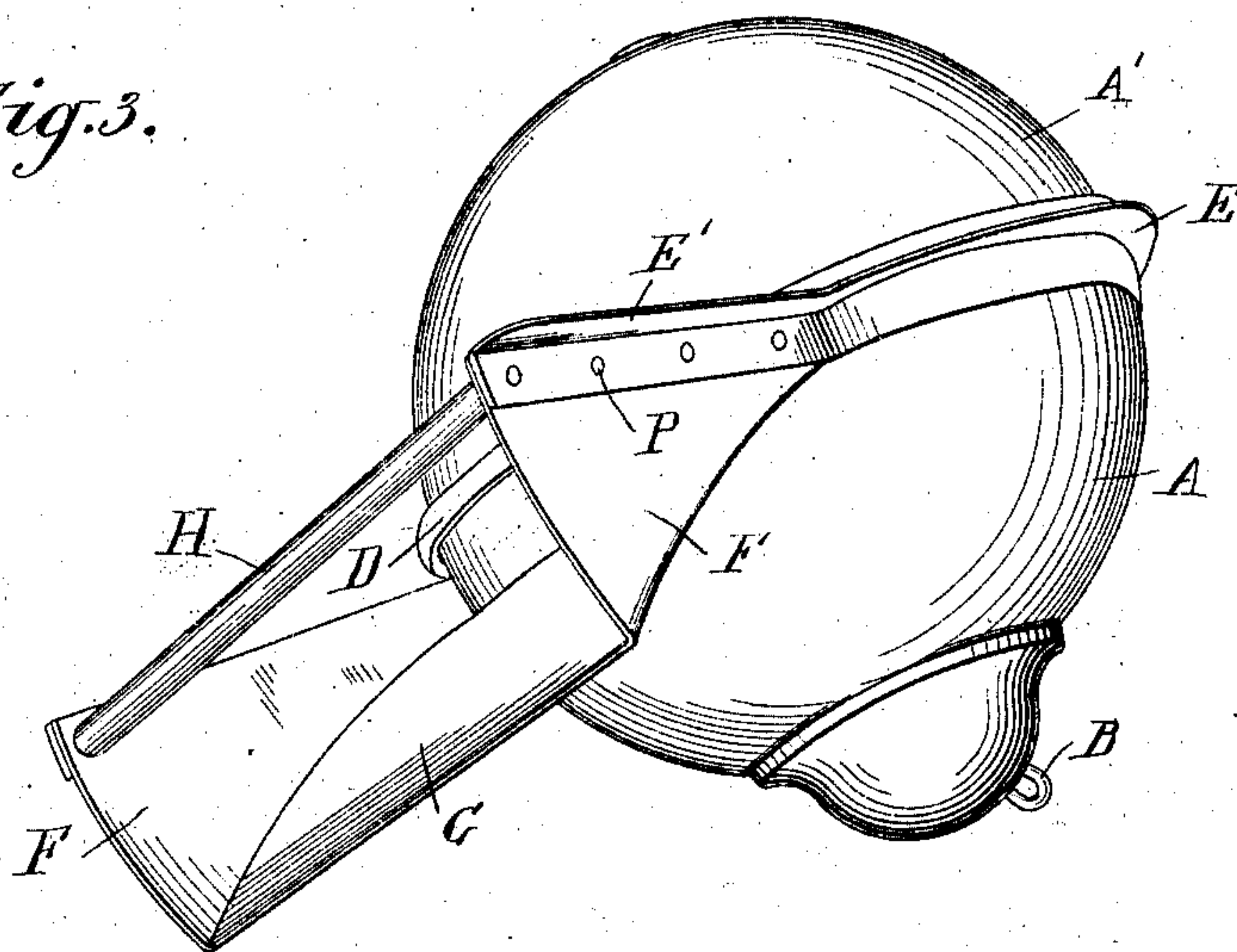


Fig. 4.

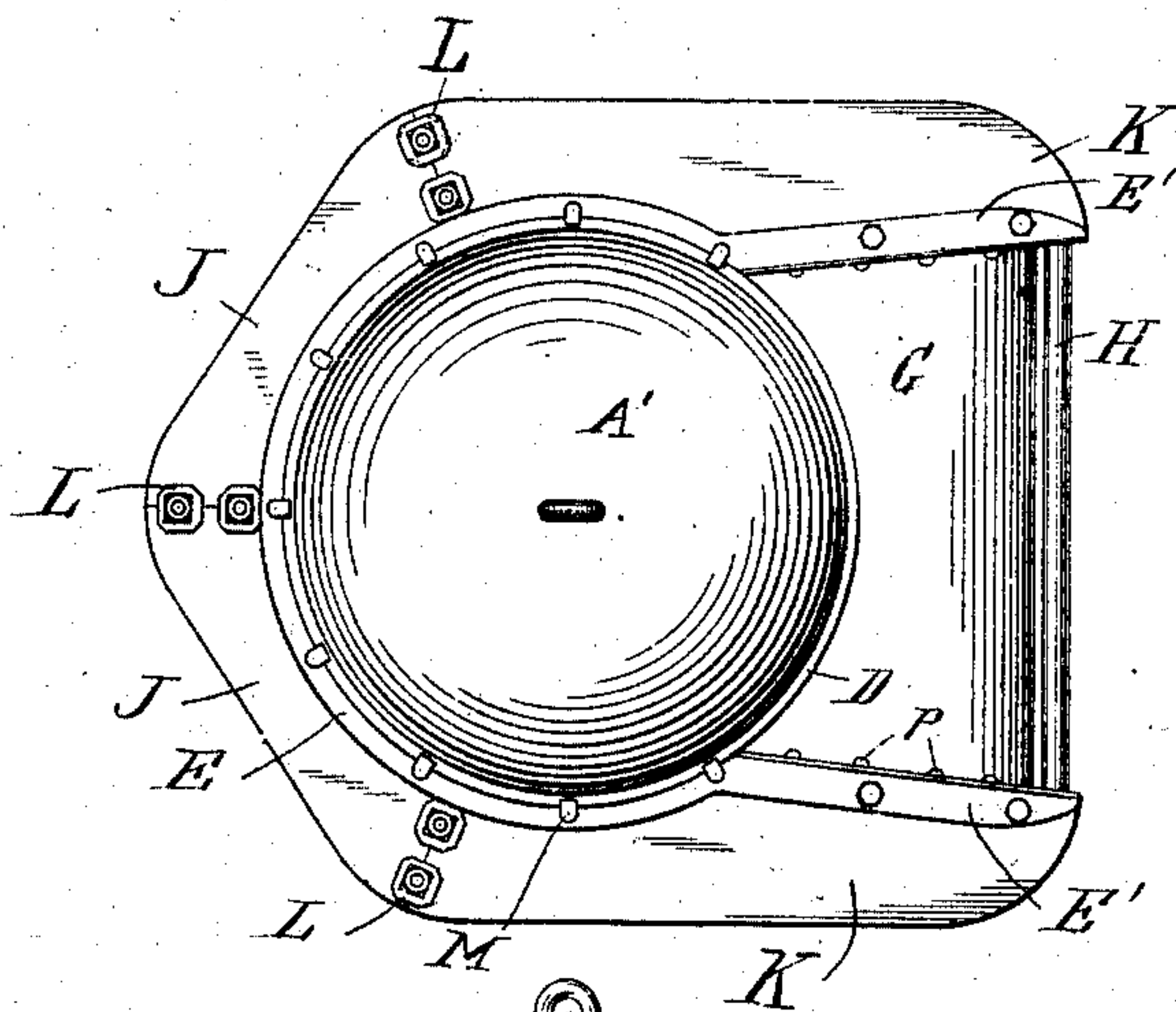
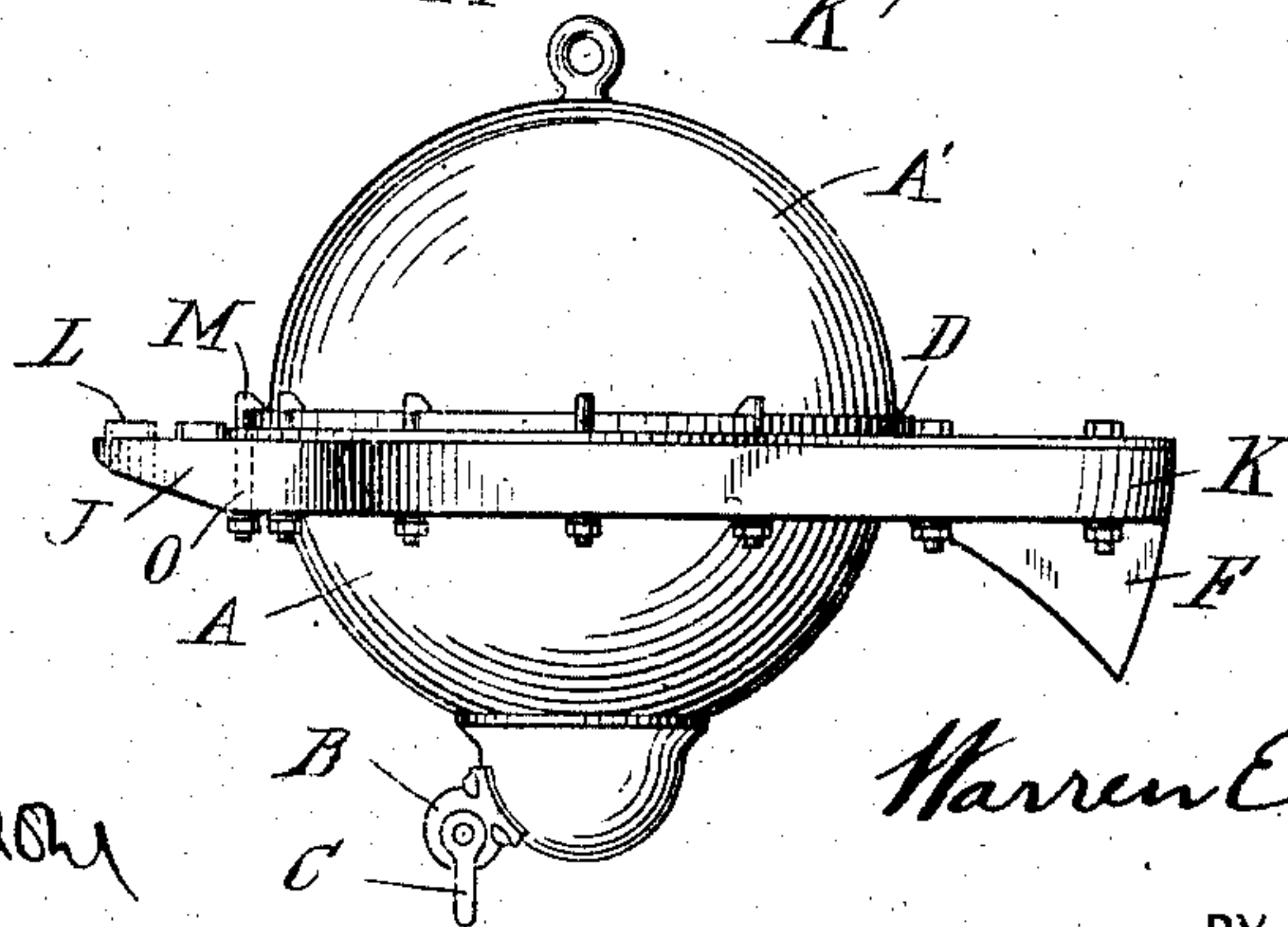


Fig. 5.



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BUOY, TORPEDO, AND SIMILAR DEVICE.

No. 846,567.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed May 31, 1905. Serial No. 263,033.

To all whom it may concern:

Be it known that I, WARREN E. HILL, a citizen of the United States, residing in New York city, in the county and State of New York, have invented a new and useful Improvement in Buoys, Torpedoes, and Similar Devices, of which the following is an exact specification.

In using buoys, torpedoes, and similar devices as heretofore constructed in places where they are subjected to strong currents the following difficulties have been experienced: The current forces the buoy or torpedo laterally from its normal position directly over the spot to which it is anchored, and thus causes it to be submerged and to assume an inclined or tipped position. In the case of torpedoes it is necessary that they should be maintained at a given distance below the surface of the water, and any substantial submergence below such distance would tend to remove them from the field of action. In the case of buoys it is equally desirable that they should be maintained in a given position relative to the surface of the water, and particularly in the case of lighting and similar buoys, that so far as possible they should be maintained in a vertical position. The force of the current also tends to cause a twirling action of the torpedo or buoy upon its anchor chain or cable, thus causing the chain to shorten and the device to become submerged, causing the electric wire often carried by the anchor-chain to become twisted about the anchor-chain and generally causing wear and frequent breakage of the parts due to the torsional strain.

The object of my invention is effectively to prevent the twisting of the buoy or similar device and to prevent its undue submersion and tipping even when subjected to strong currents.

My invention relates to a buoy, torpedo, or similar floating device from one side of which projects in a generally horizontal plane a tailpiece or fin which prevents undue submergence, as hereinafter explained. From the same side of the buoy vertical fins may be extended to serve as rudders and prevent twisting.

In the accompanying drawings I have illustrated one form of my invention as applied to a spherical torpedo.

Figure 1 is a side elevation of a torpedo equipped with my invention. Fig. 2 is a plan view from the top. Fig. 3 is a perspective view; Figs. 4 and 5, respectively, a top plan view and a side elevation of a similar device equipped with a wooden fender.

A and A' are the halves of the sheet-metal torpedo, that may be joined in any suitable manner, as by welding them together with a flange D, or the torpedo may be formed in any other usual way. At the bottom of the torpedo is the eye B, to which is attached the anchor-cable C, carrying the electric wire c, entering the bottom of the torpedo. The eye B is preferably located at one side of the center line of the torpedo and at the side opposite to the fins F, F, and G, so as to counterbalance their weight and permit the torpedo to float with its axis vertical.

E E is an angle-iron clamped to the flange D by the bolts M, which pass through the holes N or secured to the body of the torpedo in any other suitable manner and having ends E' E' projecting from the torpedo at one side thereof. Attached to these ends of the angle-iron is a fin G, arranged generally in a horizontal plane, preferably consisting of a piece of sheet-metal curving downward from its line of contact with the torpedo toward its free end and connected to the angle-iron E₁ E₁ by vertical plates or fins F F.

H is a strip or rod connecting the ends of the angle-iron and the vertical fins, giving greater rigidity to this part of the structure. The fins F F are preferably arranged so as to flare out slightly from the torpedo-body, as shown in Fig. 2.

In order to compensate for the weight of the angle-iron and fins and to give to a torpedo or buoy having these attachments the same flotation as before without altering the size of the torpedo or buoy, I surround the body of the torpedo or buoy with a buoyant wooden fender or rim, (shown in Figs. 4 and 5 by the letters J J K K,) which fender is attached to the torpedo-body in any suitable way—as, for example, by bolts O, passing through the fender, and angle-iron E, and clamping these parts to the flange D by bolts M, as shown on Fig. 5. This fender may be made in sections, as shown on Fig. 4, which sections may be held together by the bolts L, having heads with pointed ears L₁ entering the wood when the nuts are screwed down

upon the bolts. In order to counterbalance the flotation of the wooden rim surrounding the front of the torpedo, the rim may be extended to the rear along the ends of the angle-iron $E_1 E_1$ to a greater distance than the rim projects in front of the torpedo, the rear ends of the rim $K K$ being bolted by bolts P or otherwise suitably fastened to the ends of the angle-iron $E_1 E_1$. In place of the wooden rim a rim of hollow metal or other floatable substance may be used. The rim not only serves to increase the flotation of the buoy, but also serves as a fender or buffer.

When a torpedo, buoy, or similar device equipped with my invention is anchored in a current, the vertical fins $F F$ act as a rudder and cause the device always to keep its head toward the current, thus preventing twisting of the device on its anchor-chain. The use of the double fins $F F$ has many advantages over a single fin or rudder located directly at the rear of the torpedo, inasmuch as the water rushing rapidly around such a body tends to form a vacuum directly at the rear and thus reduce the efficiency of the fin as a rudder where only one fin is used. The double fins prevent the possibility of any such hindrance to their action as rudders, and the slight flaring of the fins, as shown in Fig. 2, increases their efficiency.

The horizontally-arranged fin G tends to prevent the torpedo, buoy, or other submerged floating device from being forced by the current from its normal position over the spot where it is anchored and maintains the torpedo or buoy with its axis vertical. This is due to the fact that the current striking upon the under side of the fin G lifts the torpedo or buoy and causes it to ride over the current in the same manner as the current of air maintains a kite in a given position. The curvature of the under surface of the fin G assists in this action. By attaching the anchor-cable to the torpedo or buoy at a point on the opposite side of the center line of the buoy from the fin G the buoy will be maintained in substantially the same position even when it is subjected to strong currents.

Having now disclosed this invention by describing illustrative embodiments thereof, to the details of which I do not, however, desire to be limited, what I claim as new, and what I desire to secure by Letters Patent, is set forth in the appended claims:

1. An anchored substantially spherical floating device provided with a substantially horizontally arranged fin projecting from one side adjacent the center thereof to promote the substantially uniform submergence of said device.

2. An anchored substantially spherical floating device provided with a substantially horizontally projecting fin unsymmetrical about the axis of attachment of the device and adjacent its middle portion.

3. An anchored submerged floating device provided with a substantially horizontal fin projecting from one side thereof and having a downwardly-inclined free end.

4. An anchored floating device provided with a substantially horizontally arranged fin projecting from one side thereof and a vertically-arranged fin projecting from the same side of said device.

5. A floating device provided with a substantially horizontally arranged fin projecting from one side thereof and having its free end downwardly inclined and outwardly-diverging substantially vertical fins at either side of said horizontal fin.

6. A submerged floating device having a substantially horizontally arranged fin projecting from one side and adjacent the middle thereof and an anchor-line connection on the opposite side of the vertical axis of said device.

7. A submerged substantially spherical floating device provided with a substantially horizontally arranged fin projecting from one side thereof and provided with a buoyant fender.

8. A submerged floating device provided with a substantially horizontally arranged fin projecting therefrom to promote its uniform submergence and a buoyant fender connected with said device and substantially symmetrical with respect to its vertical axis of flotation.

9. A submerged floating device provided with a substantially horizontal fin projecting unsymmetrically from said device with respect to its axis of attachment to promote its uniform submergence and a buoyant device connected with said fin to substantially counterbalance its weight.

10. An anchored submerged substantially spherical floating device provided with a substantially horizontally projecting fin around the circumference of and unsymmetrical about the axis of attachment of said device and having a width substantially equal to the diameter of said device.

11. A submerged substantially spherical floating device having a substantially horizontally arranged fin of a width substantially equal to the diameter of said device projecting circumferentially from one side thereof and an anchor-line connection on the opposite side of the vertical axis of said device.

12. A floating device provided with a substantially horizontally arranged fin projecting from one side thereof, the free end of said fin being downwardly inclined and provided with outwardly-diverging substantially vertical fins at either side of said horizontal fin and provided with a buoyant fender substantially in line with said fin.

13. A substantially spherical floating device, a projecting fin having attaching means encircling said device and auxiliary fins ad-

jacent said fin and transversely arranged with respect thereto.

14. A substantially spherical floating device, a fin provided with attaching means encircling said device and a buoyant fender to be secured to said attaching means and device substantially in line with said fin.

15. An anchored submerged floating device provided with means to cause said device to face varying currents and provided with a downwardly and rearwardly inclined fin engaging such currents to promote the substantially uniform submergence of said device.

16. An anchored submerged floating device provided with a fin to cause said device to face varying currents and provided with a downwardly and rearwardly inclined fin engaging such currents to promote the substantially uniform submergence of said device.

17. A submerged floating device to be anchored in varying currents provided with a downwardly and rearwardly inclined substantially horizontal fin engaging such currents to promote the substantially uniform submergence of said device.

18. An anchored submerged floating de-

vice, provided with means to cause said device to face varying currents and provided with a projecting fin engaging such currents, to promote the substantially uniform submergence of said device.

19. An anchored submerged substantially spherical floating device, provided with a projecting fin adjacent the middle portion engaging varying currents to promote the substantially uniform submergence of said device.

20. An anchored submerged floating device provided with means to cause said device to face varying currents and provided with a projecting fin adjacent the middle portion thereof engaging such currents, to promote the substantially uniform submergence of said device.

21. An anchored submerged floating device, provided with a substantially horizontal projecting fin engaging varying currents to promote the substantially uniform submergence of said device.

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Witnesses:

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