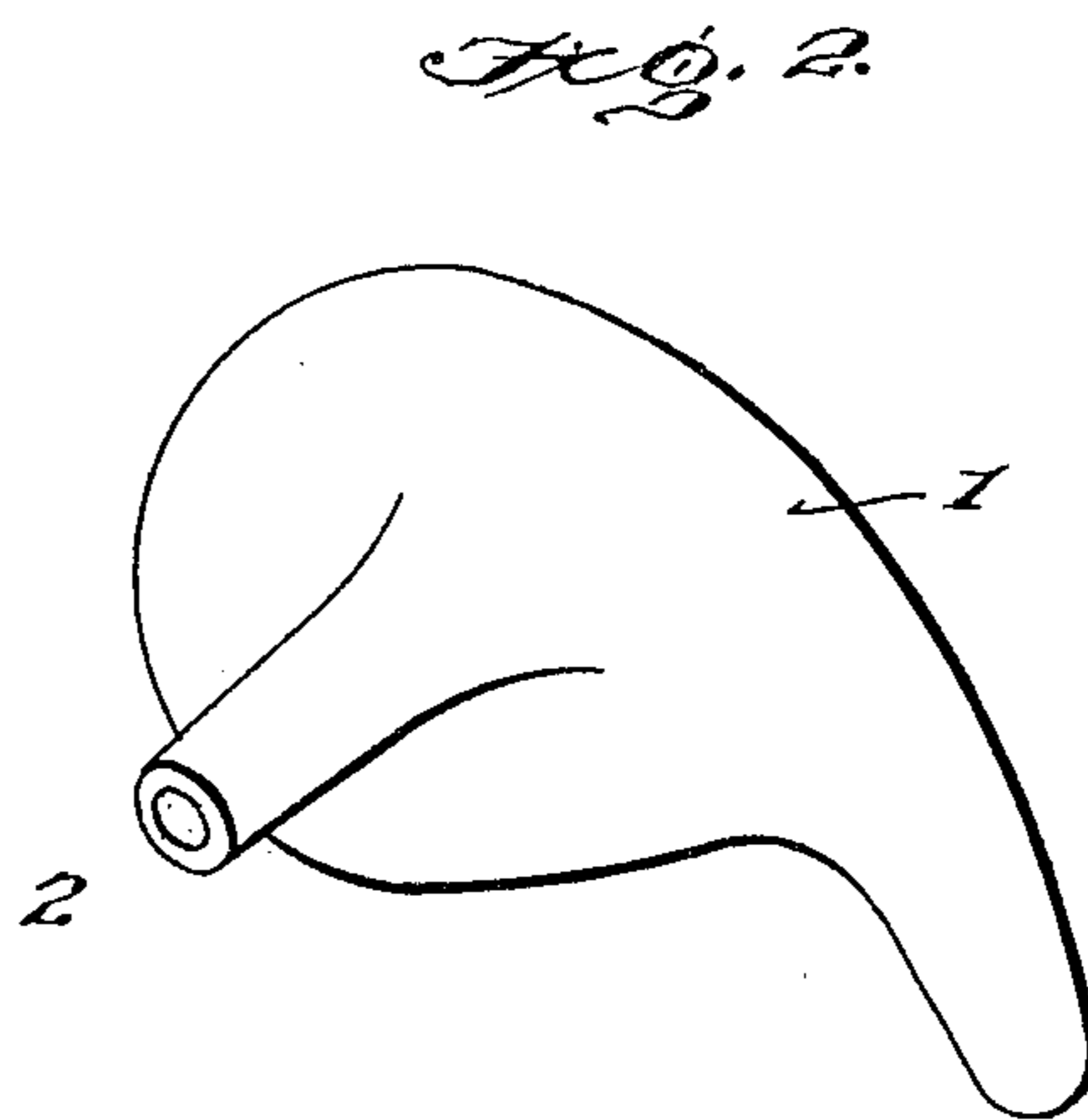
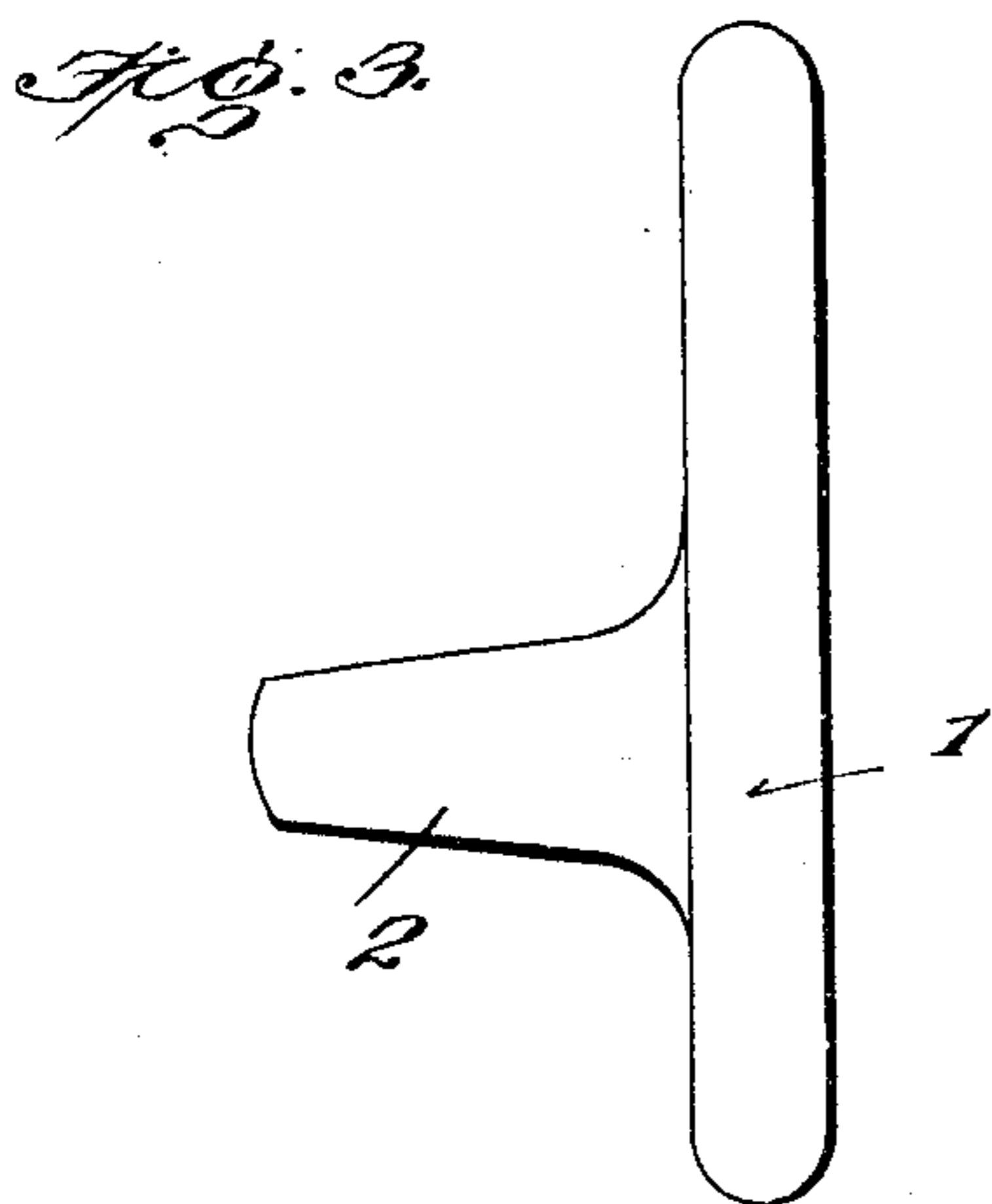
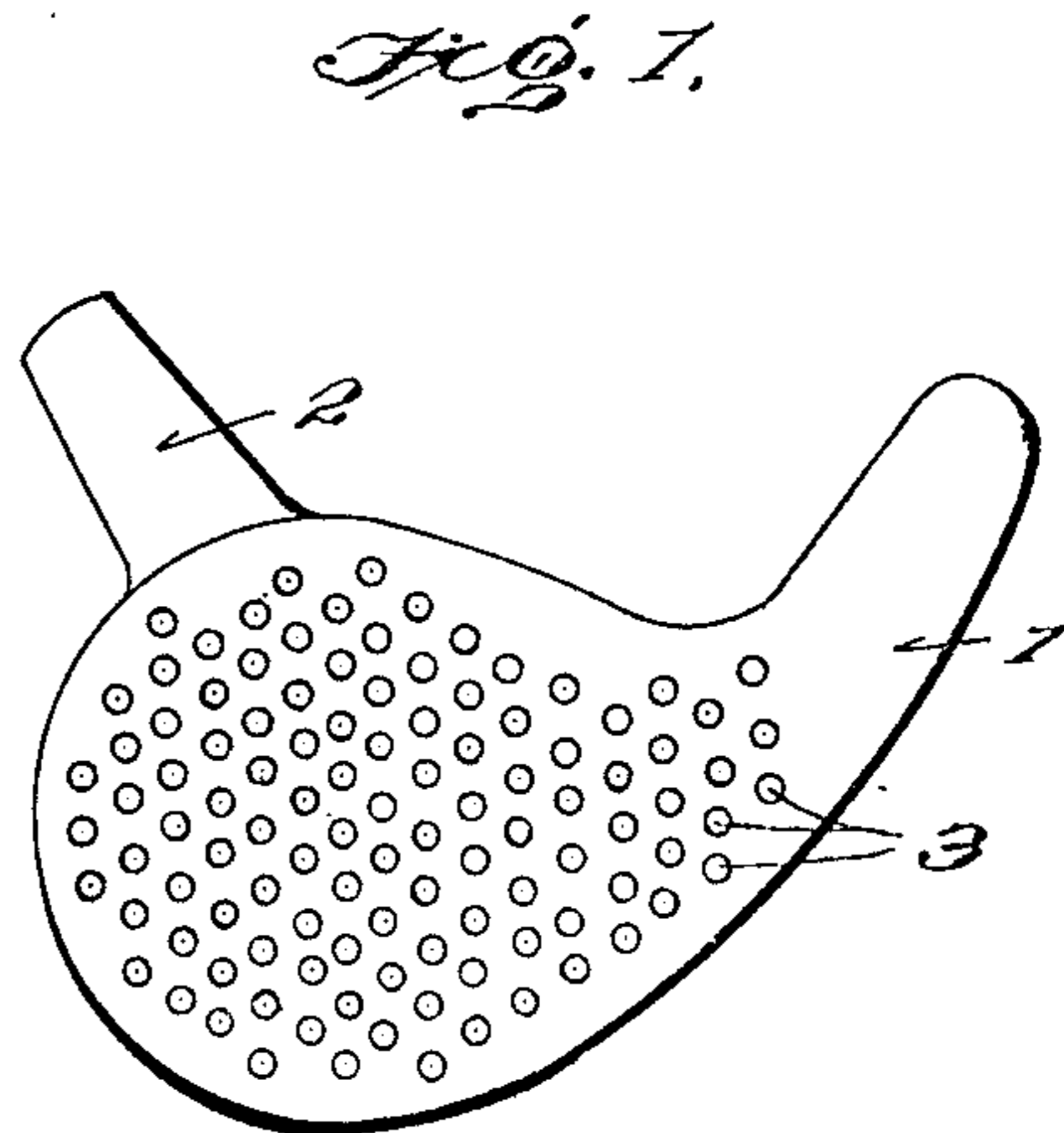
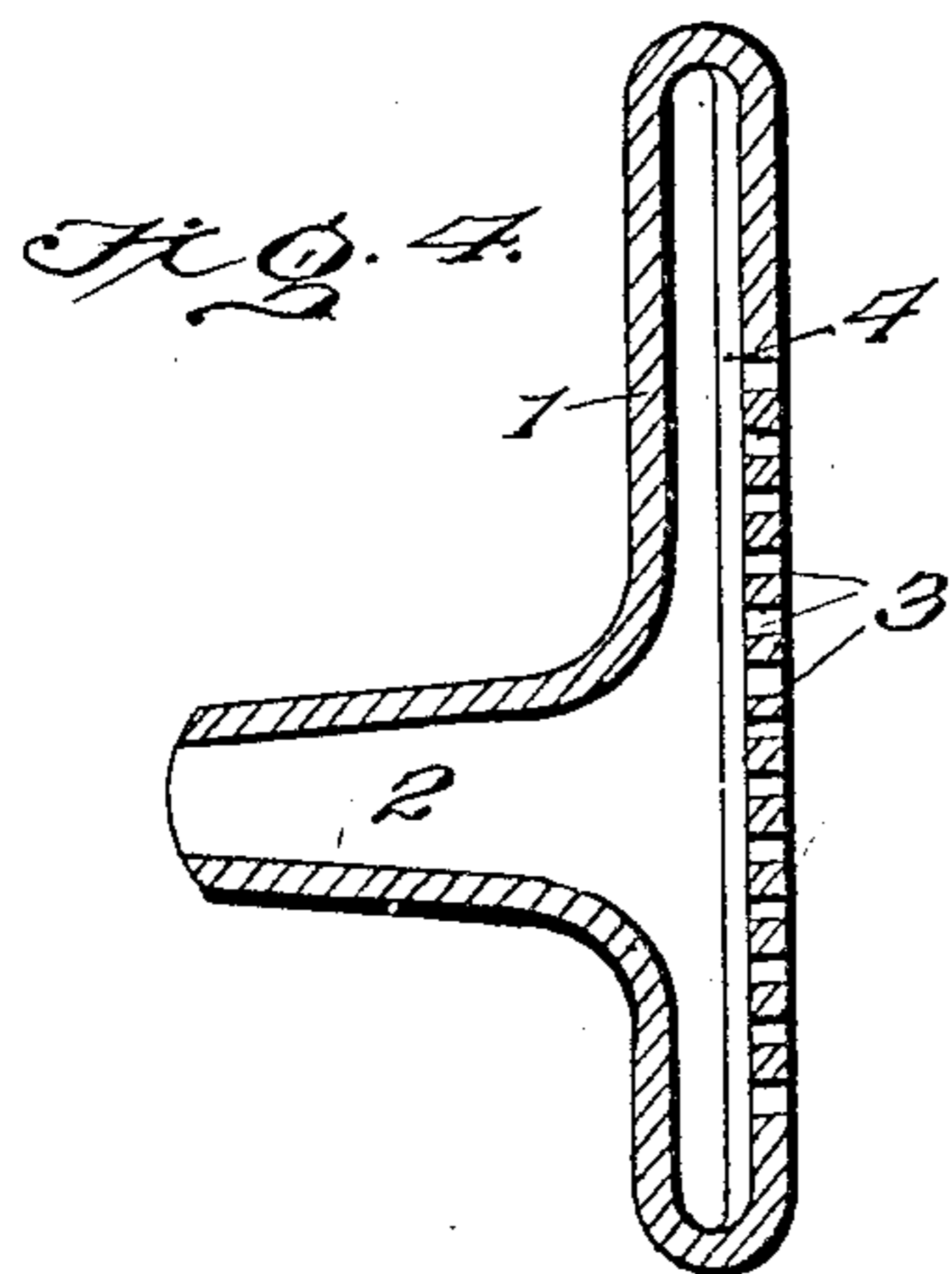


R. McWILLIAMS.
 EAR PROTECTOR.
 APPLICATION FILED OCT. 28, 1907.

904,715.

Patented Nov. 24, 1908.



Witnesses
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UNITED STATES PATENT OFFICE.

ROWLAND McWILLIAMS, OF EAST ORANGE, NEW JERSEY.

EAR-PROTECTOR.

No. 904,715.

Specification of Letters Patent.

Patented Nov. 24, 1908.

Application filed October 28, 1907. Serial No. 399,478.

To all whom it may concern:

Be it known that I, ROWLAND McWILLIAMS, citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Ear-Protectors, of which the following is a specification.

The present invention provides a device to be worn by swimmers or bathers for excluding water from the ears and thereby preventing the injurious effects traceable to water finding its way into the delicate organisms of the ear when swimming or bathing.

The device consists of a stopper having the general outline of the shape of the ear to fit within the same, said stopper being preferably hollow and having a stem extended therefrom to enter the passage of the ear to serve to retain the stopper in place as also to exclude water from penetrating the interior of the ear through the passage.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a perspective view of an ear protector embodying the invention. Fig. 2 is a perspective view of the protector as seen from the inner side. Fig. 3 is a side view of the protector. Fig. 4 is a central longitudinal section of the device.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The protector consists of a stopper 1 and a stem 2, the latter projecting from one side of the stopper, which is designated as the inner side. The stopper 1 in its general outline, conforms to the shape of the ear so as to fit within the same and exclude water. The stopper is flat so as not to protrude from the ear when placed in position and is approximately of pear form with the smaller or contracted end curved to one side in the plane

of the stopper. The device is constructed of soft rubber and is flexible to conform readily to the shape of the ear without producing injurious annoying pressure. The stopper 1 is hollow to increase its flexibility and enable the device to be exceedingly light to readily conform to varying shapes so as to obtain a close fit within the ear. The outer wall of the chamber or space of the stopper is perforated, the perforations 3 being comparatively small and closely related so as not to detract from the sustaining qualities of the stopper, while at the same time admitting of sound passing readily therethrough into the stopper and thence through the hollow stem 2 into the ear. An exceedingly thin diaphragm 4 is arranged close to the inner side of the outer wall of the stopper so as to exclude water while at the same time permitting sound to be readily transmitted to the interior of the ear. The water excluding diaphragm 4 is of rubber by preference, although it may consist of any thin tissue. The diaphragm 4 may be cemented or attached at its edges to the outer portion of the interior of the stopper so as to effectually prevent the passage of water therearound. The stem 2 tapers in its length and is made hollow or tubular so as to convey sound from the chamber of the stopper into the ear, the tapered form of the stem admitting of its closing the passage of the ear and exerting a slight pressure upon the walls thereof, which in conjunction with the engagement of the edge portion of the stopper with the interior of the ear, retains the device when placed in position within the ear.

The protector is exceedingly light and flexible and may be quickly placed in position in the ear or removed therefrom and when fitted in the ear effectually prevents the entrance of water therein while practically not obstructing the transmission of sound which is of special advantage.

Having thus described the invention, what is claimed as new is:

1. An ear protector comprising a chambered head adapted to fit within the ear and formed with a perforated portion, and a diaphragm arranged within the chambered portion of the head, the said diaphragm being protected by the perforated portion of the head and cooperating therewith to exclude foreign matter and permit the transfer of sound.

2. An ear protector formed of yielding

material and comprising a flattened chambered head adapted to fit closely within the exterior portion of the ear, a hollow stem extended from the inner side of the head, and
5 means cooperating with the head and stem to transmit sound and excluding foreign matter.

3. An ear protector formed of yielding material and comprising a flattened chambered head adapted to fit closely within the
10 exterior portion of the ear, the outer side of the head being perforated, a hollow stem projecting from the inner side of the head, and a diaphragm cooperating with the perforated side of the head to exclude foreign
15 matter and permit the transmission of sound.

4. A new article of manufacture, consisting of an ear protector formed of soft rubber

and comprising a flattened chambered head of pear form and having the contracted end
20 curved to one side, the outer wall of the stopper being provided with a series of small openings, a hollow tapered stem extended from the inner wall of the stopper, and an
25 exceedingly thin diaphragm arranged within the chamber of the stopper close to the outer perforated wall to exclude foreign matter without obstructing the transmission of sound.

In testimony whereof I affix my signature
30 in presence of two witnesses.

ROWLAND MCWILLIAMS. [L. s.]

Witnesses:

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