

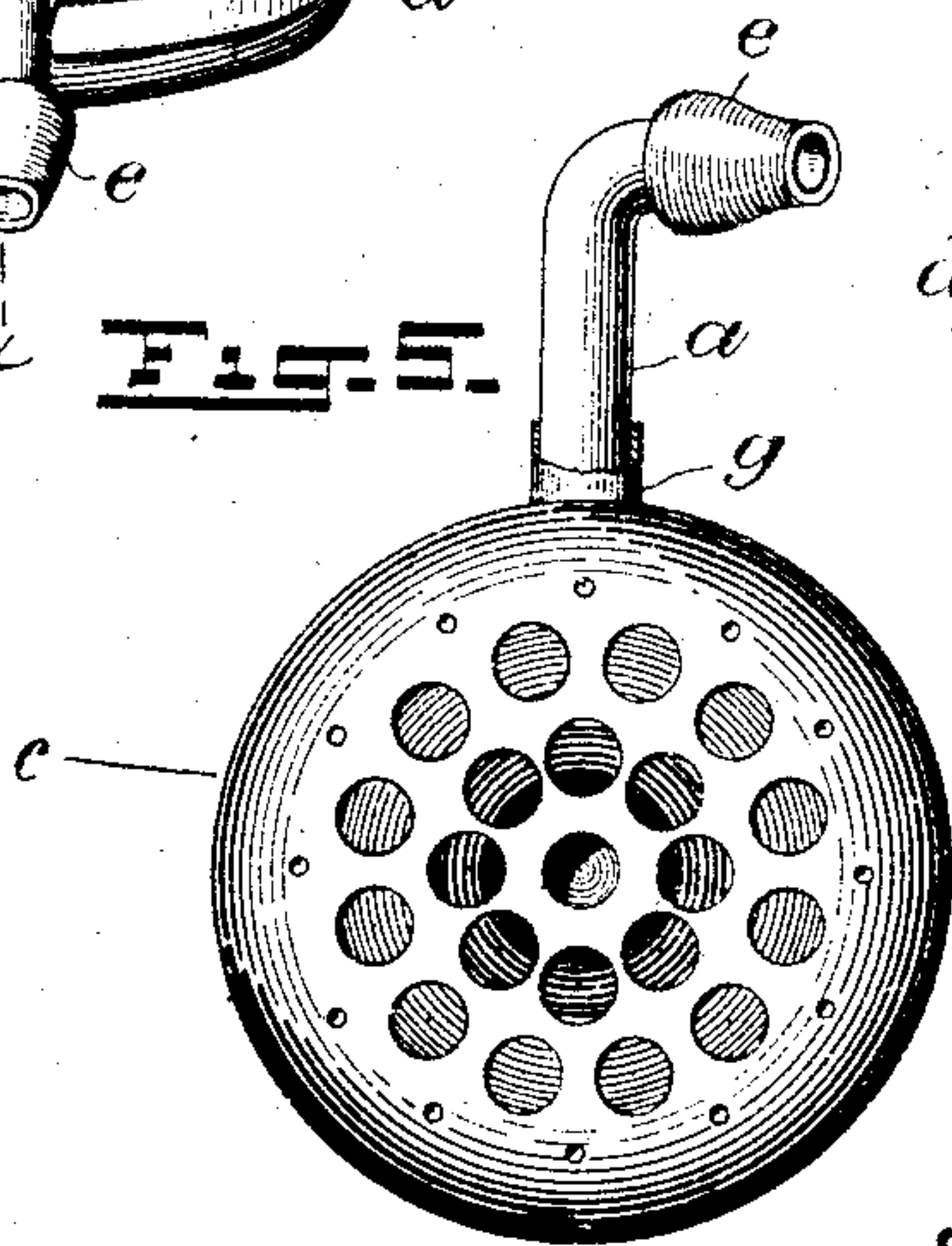
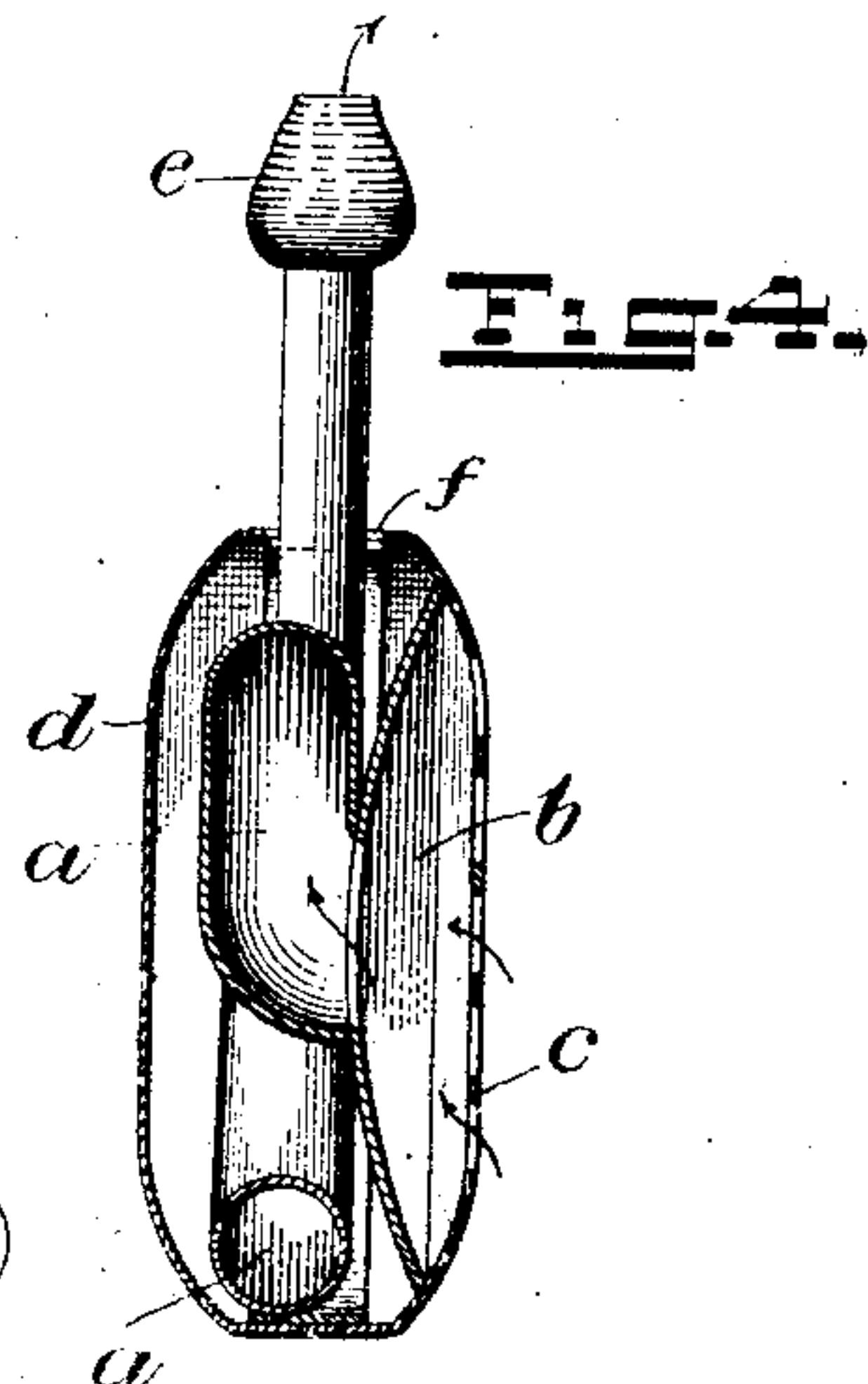
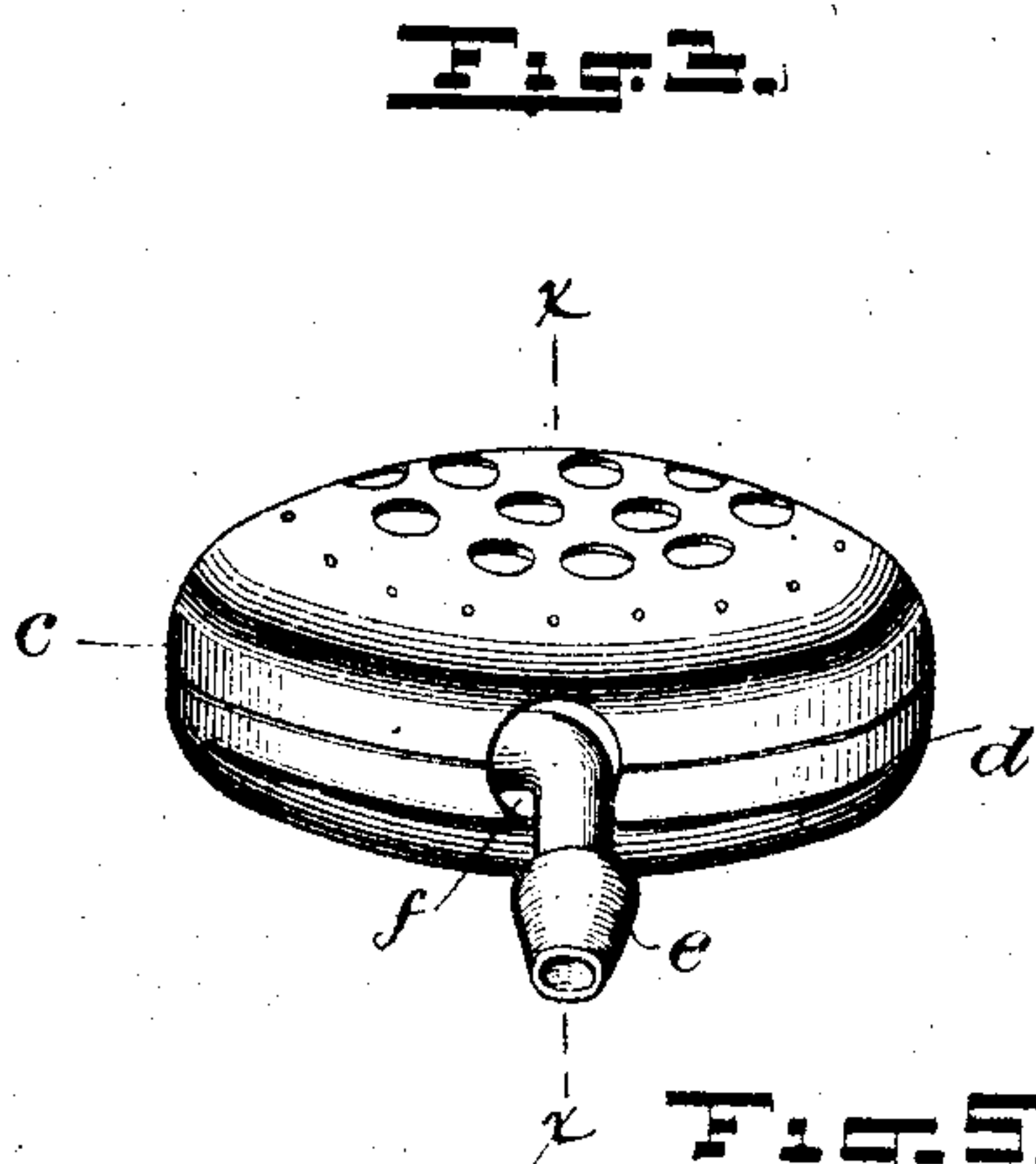
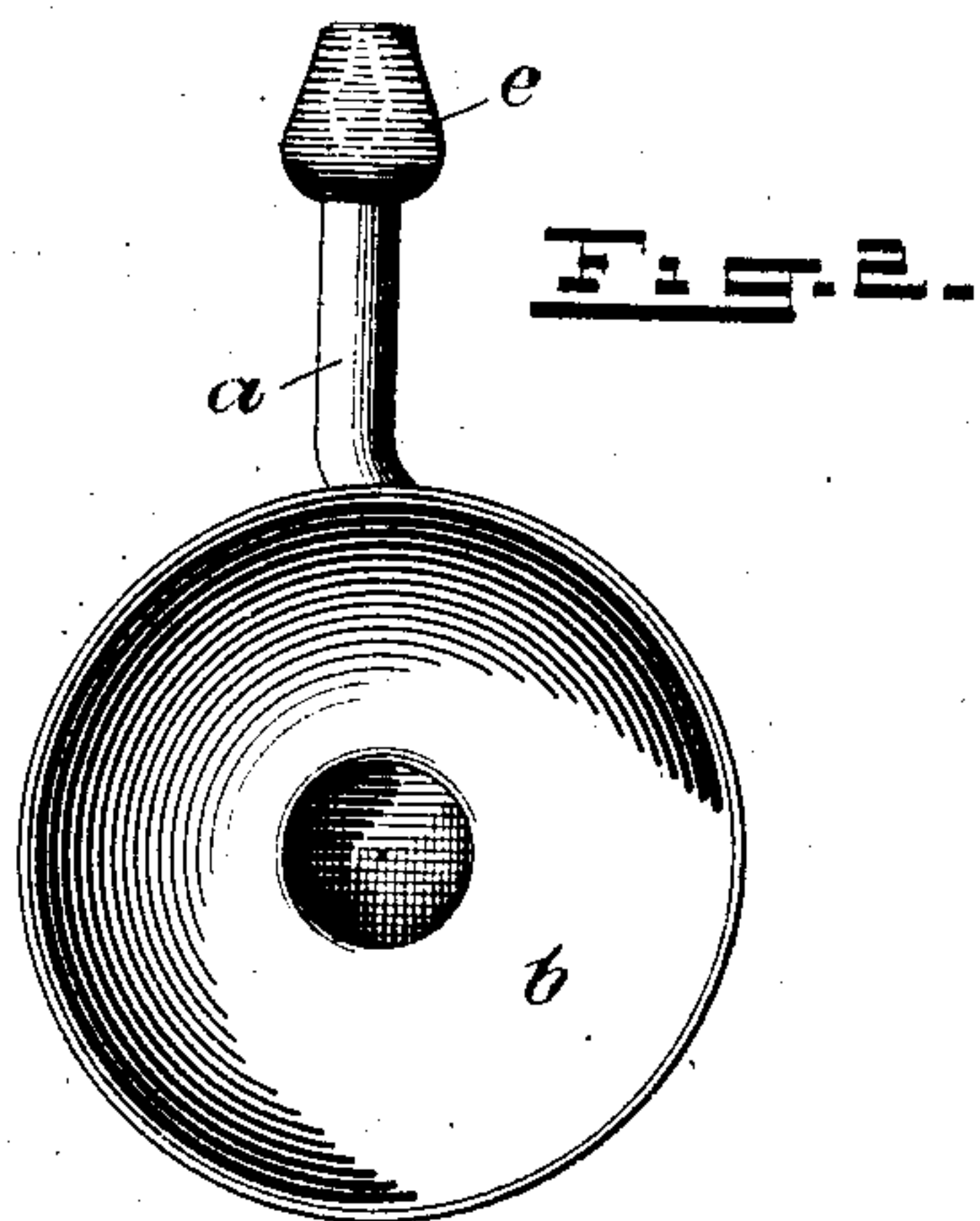
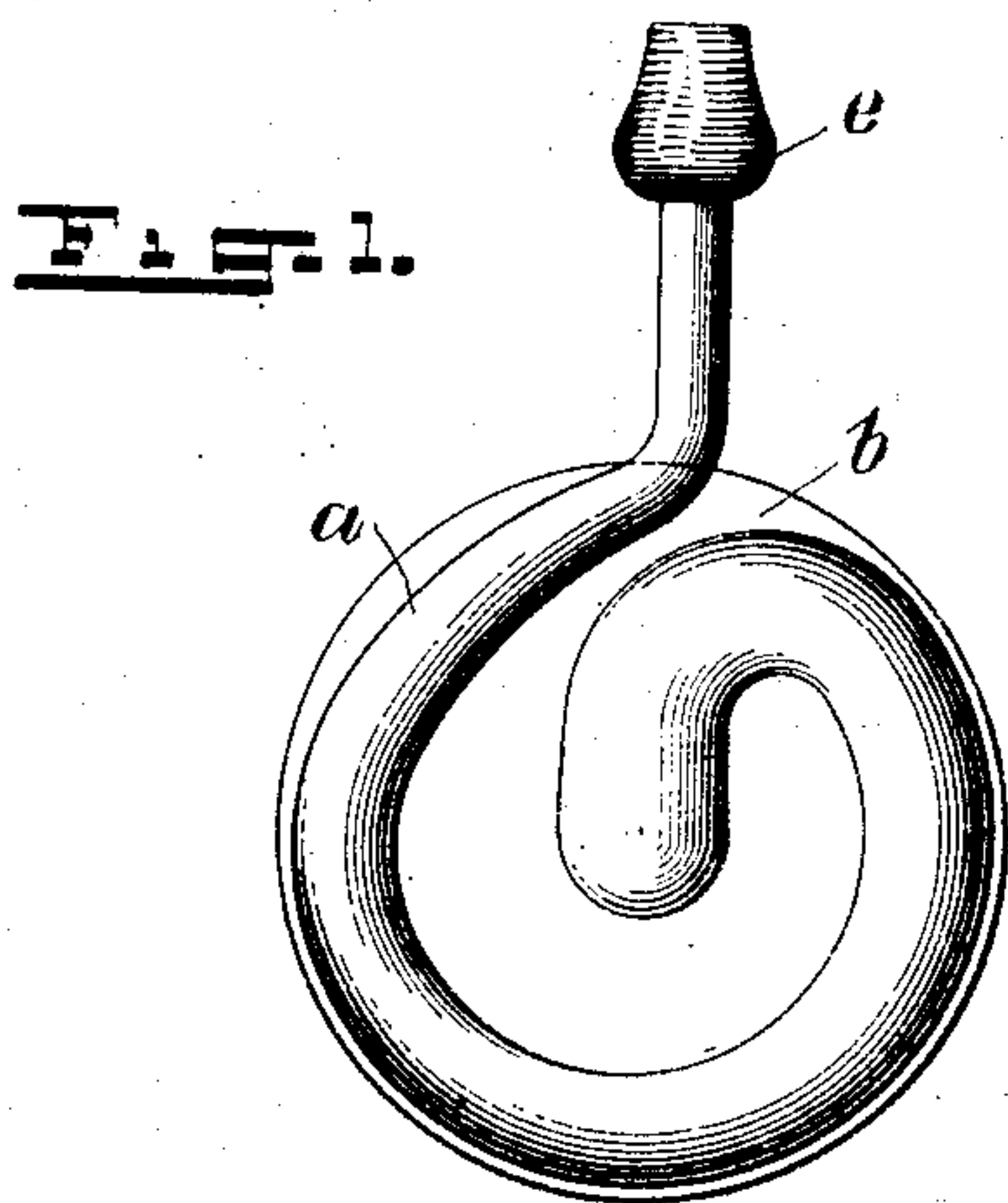
No. 671,138.

Patented Apr. 2, 1901.

A. A. KNUDSON & F. H. CLARK.  
INSTRUMENT FOR IMPROVING THE HEARING.

(Application filed Oct. 23, 1900.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

ADOLPHUS A. KNUDSON, OF RUTHERFORD, NEW JERSEY, AND FRANK H. CLARK, OF BROOKLYN, NEW YORK.

## INSTRUMENT FOR IMPROVING THE HEARING.

SPECIFICATION forming part of Letters Patent No. 671,138, dated April 2, 1901.

Application filed October 23, 1900. Serial No. 34,034. (No model.)

*To all whom it may concern:*

Be it known that we, ADOLPHUS A. KNUDSON, residing at Rutherford, in the county of Bergen and State of New Jersey, and FRANK H. CLARK, residing at the borough of Brooklyn, in the city of New York, in the county of Kings and State of New York, citizens of the United States, have invented a new and useful Improvement in Instruments for Improving the Hearing, of which the following is a specification.

The object of our invention is to provide a neat, simple, and effective device which will enable persons of defective hearing to distinguish sounds more clearly.

Various methods have been heretofore used in a device of the nature shown and described for confining the sound-waves and conducting the greatest volume of sound to the inner ear, but without great success. We find that the several objectionable features of the devices of this nature heretofore known may be avoided and the desired results obtained by flaring one end of the tube to receive the sound-waves and forming the tube into coils or convolutions through which the sound-waves are conducted to the inner ear, the coils or convolutions of the tube confining the sound-waves and producing the desired result.

We attain the object referred to above by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a view of the underside of the trumpet or tube removed from the case. Fig. 2 is a view of the upper side of the same. Fig. 3 is an elevation of the instrument complete. Fig. 4 is a section of the instrument on the line  $x x$ , Fig. 3. Fig. 5 is an optional form of the projecting earpiece.

Similar letters refer to similar parts throughout the several views.

$c d$  is a case of a form preferably similar to the usual watchcase, composed of the superior part or cover  $c$  and the inferior part  $d$ . The cover  $c$  is of open-work of any desired pattern to admit the sound-waves, or it may be made of wire-netting. We find it preferable to make this case of metal, hard rubber,

or similar substance. An aperture  $f$  is provided in the side or edge of the case  $c d$ , through which the end of the tube  $a$  projects.

Within the case  $c d$  we place a coiled tube  $a$ , preferably tapering, having one end  $b$  at about the center of the coil spreading outwardly or flaring to nearly the circumference of the case and facing the open part or cover  $c$  of the case.

The tube  $a$  is coiled about the center, so that an end of the tube projects through the aperture  $f$  in the side or edge of the case  $c d$ . This end we provide with an end piece  $e$  to insert in the outer ear of the person using the instrument.

The whole instrument complete is of such size and form that it can be concealed in the palm of the hand, with the end piece  $e$  inserted in the outer ear, without attracting attention.

The sound-waves passing through the openings in the cover  $c$  are collected by the flaring end  $b$  and conducted to the ear through the coiled tube  $a$ . When desired, the end of the tube projecting beyond the side or edge of the case may be bent, as shown at Fig. 5. The end may also be provided with a separable joint, as shown at  $g$ , so that it may be removed when desired or turned in different directions at the option of the person using it.

Having thus described our invention, what we claim is—

In a device of the nature described the combination of a case, one side of which is provided with apertures, a flat spiral coil of tubing within the said case, a flaring end of said tube adjacent to and facing said apertures and the other end of said tube projecting through an opening in the case, substantially as shown and described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ADOLPHUS A. KNUDSON.  
FRANK H. CLARK.

Witnesses:

F. Y. BROWN,  
ROBERT PITTS.