

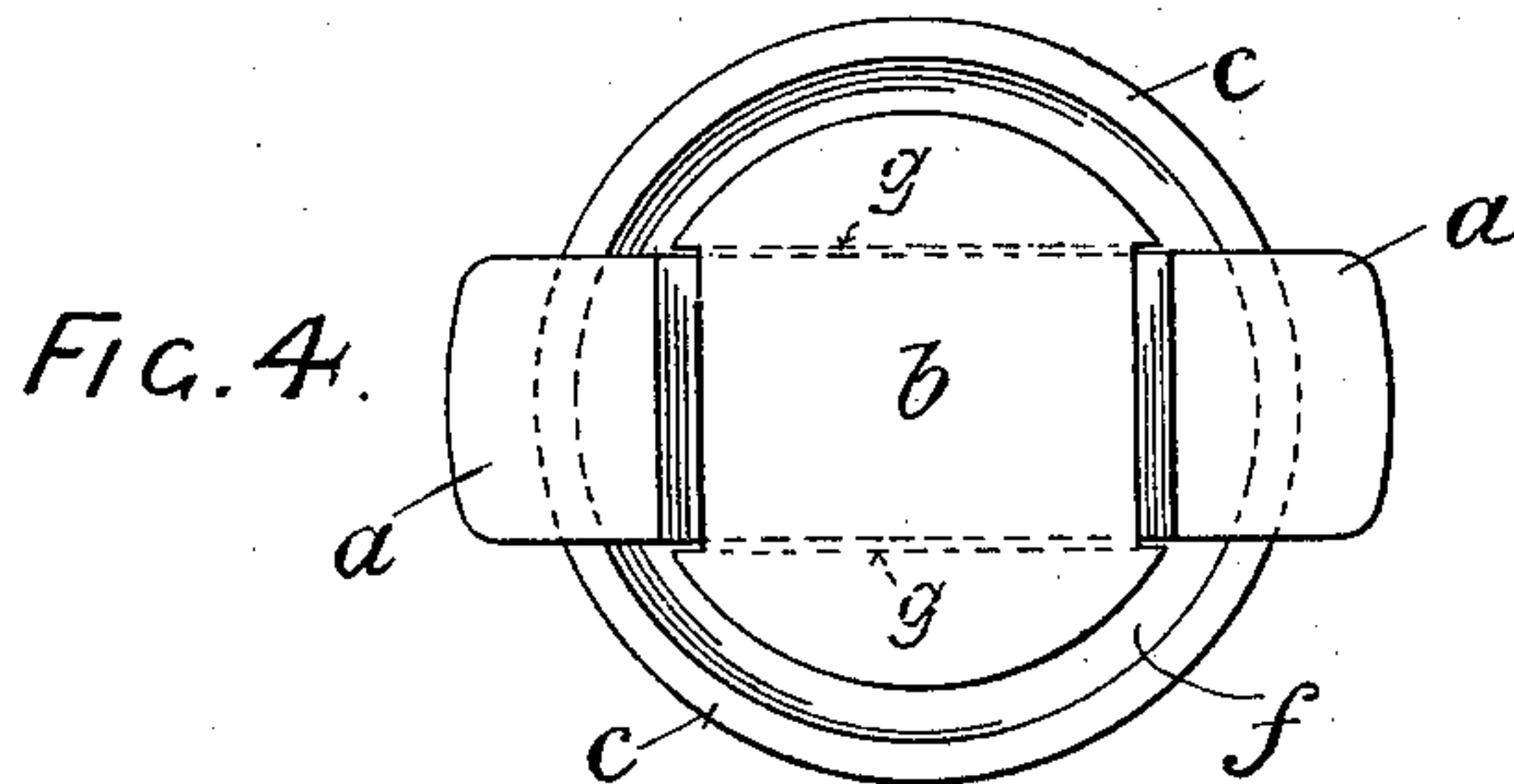
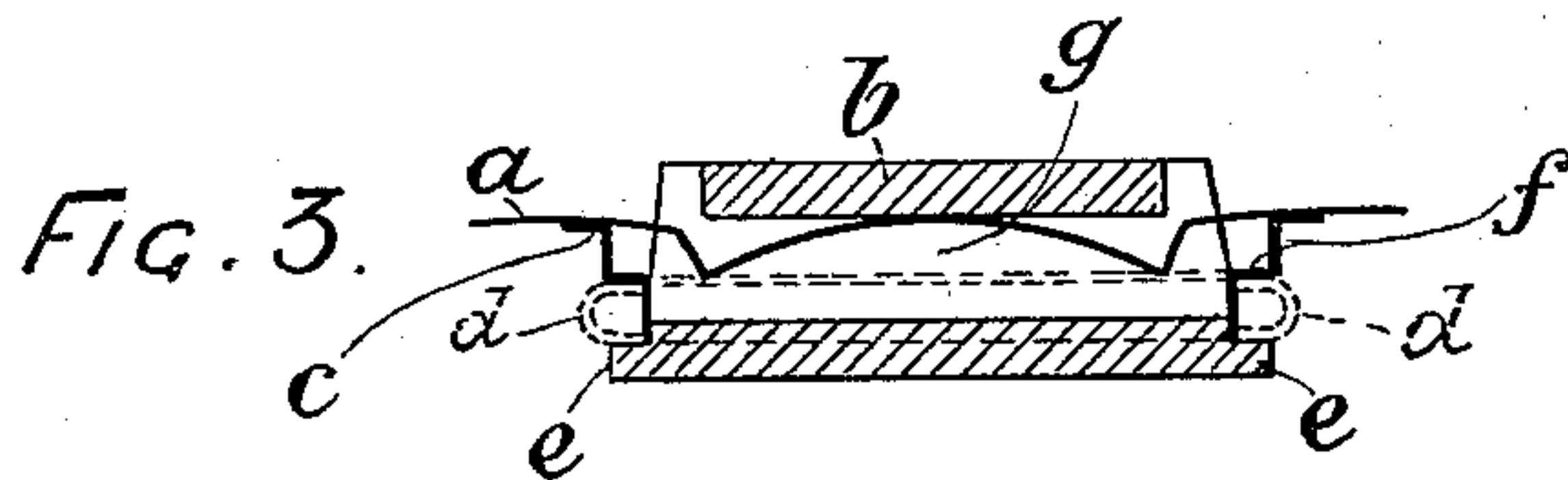
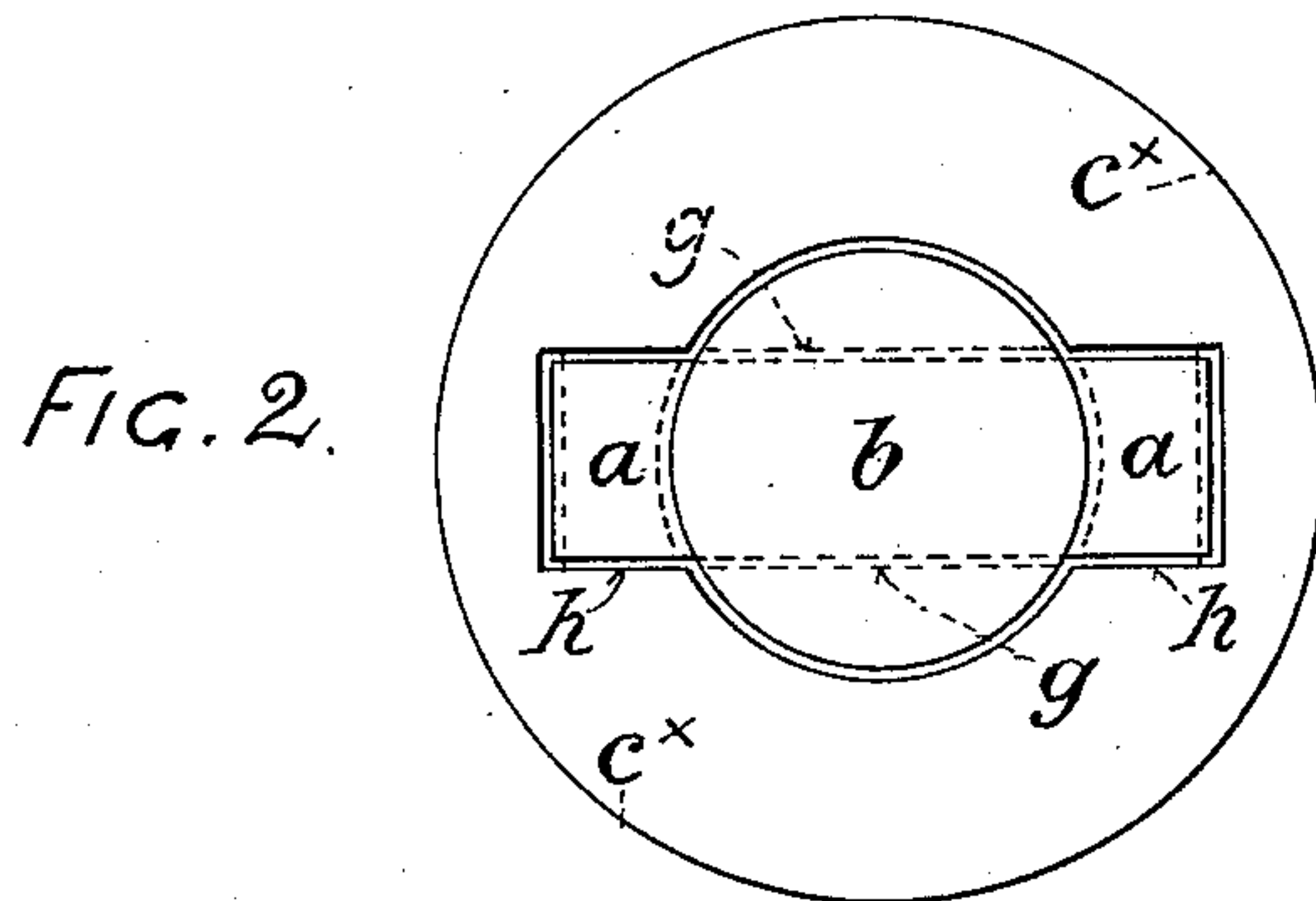
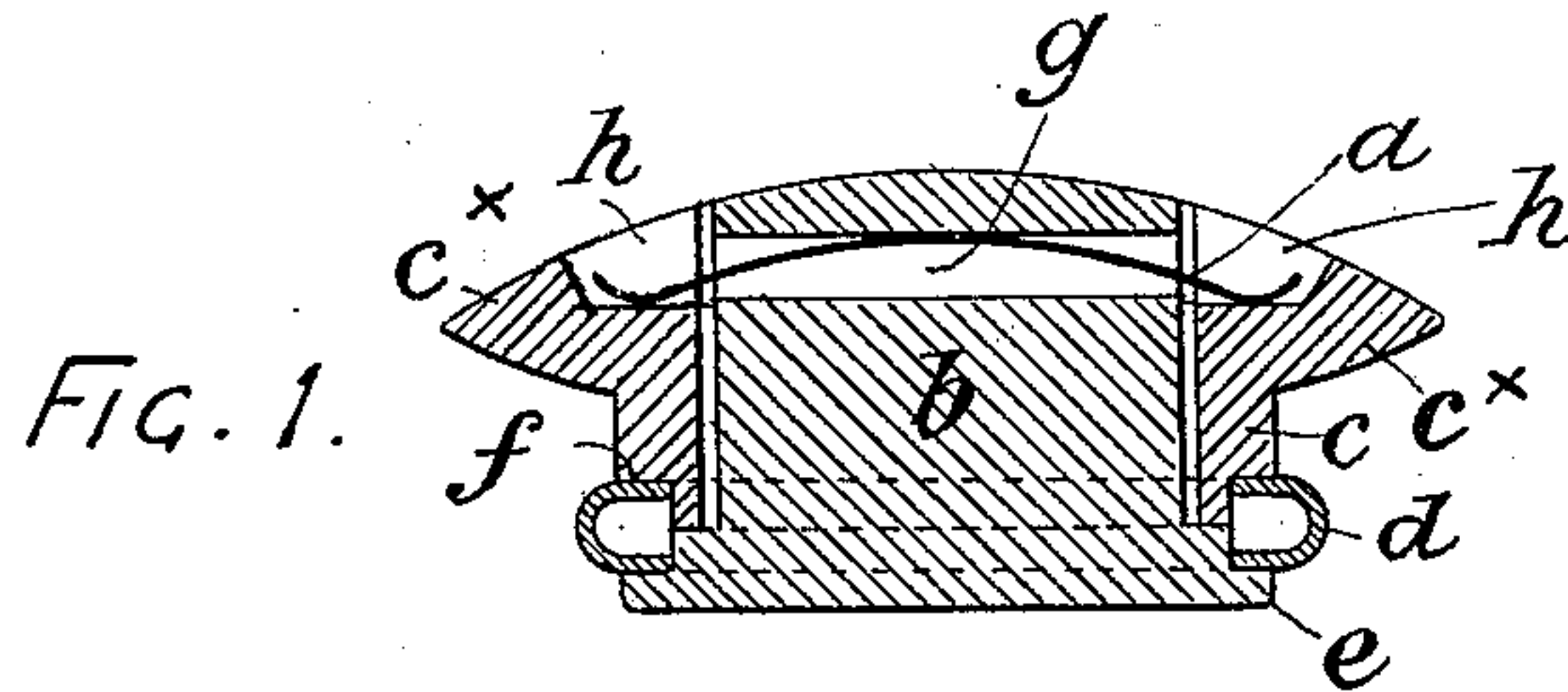
No. 610,408.

Patented Sept. 6, 1898.

E. A. MATTHIAS & W. H. HARRISON.  
STOPPER FOR JARS, BOTTLES, CANS, OR OTHER VESSELS.

(Application filed June 21, 1898.)

(No Model.)



WITNESSES.

*B. W. Wright*  
*S. C. Connor*

INVENTORS

E. A. MATTHIAS  
W. H. HARRISON

BY *Howson and Howson*  
THEIR ATTORNEYS.

# UNITED STATES PATENT OFFICE.

EDWARD A. MATTHIAS, OF LIVERPOOL, AND WILLIAM H. HARRISON, OF MANCHESTER, ENGLAND.

## STOPPER FOR JARS, BOTTLES, CANS, OR OTHER VESSELS.

SPECIFICATION forming part of Letters Patent No. 610,408, dated September 6, 1898.

Application filed June 21, 1898. Serial No. 684,053. (No model.)

*To all whom it may concern:*

Be it known that we, EDWARD ALEXANDER MATTHIAS, residing at Liverpool, and WILLIAM HENRY HARRISON, residing at Manchester, in the county of Lancaster, England, subjects of the Queen of Great Britain, have invented new and useful Improvements in Stoppers for Jars, Bottles, Cans, or other Vessels, of which the following is a specification.

This invention relates to improvements upon an invention for which Letters Patent were granted to us in the United States of America, No. 579,877, dated March 10, 1897, the object of the present invention being to simplify and improve the manufacture of such stoppers.

We still form the stopper in two parts horizontally divided and made cylindrical or slightly conical and so that one can slide inside the other, a circumferential groove or neck being made at the point of junction to receive a ring of india-rubber or other suitable substance or composition, so formed that when the two parts of the stopper are closed together the said ring bulges out beyond the circumference of the stopper and so fills the mouth of the bottle or orifice of the jar or vessel in a perfectly air-tight manner, and when the two portions of the stopper are slightly separated from each other the bulge is flattened by the natural contraction of the india-rubber and the stopper becomes a slack fit, in which state it can easily be placed in or withdrawn from the mouth of the jar or vessel.

According to the specification of our original patent above mentioned the two parts of the stopper were normally held together by a strong india-rubber spring or springs, which when in action automatically draw the two parts together, so as to cause the india-rubber ring to bulge out all around the circumference.

The annexed drawings illustrate our present improvement, Figure 1 being a central vertical section, and Fig. 2 a plan view, of one way of carrying the same into practice. Figs. 3 and 4 are similar views of a modified form of the improved stopper.

According to our present improvements

(see Figs. 1 and 2) we dispense with the strong india-rubber spring or springs and we use in place thereof a flat metal or other spring *a*, preferably of steel, bent into an arched form, for forcing the two parts *b* and *c* of the stopper together, so as to bulge out the india-rubber ring *d*.

The lower or inner portion *b* of the stopper is made in the form of a plug slightly conical outside and is provided with a projecting flange *e* all around the bottom, which forms the lower portion of the groove in which the india-rubber ring *d* rests. Near to the top of this portion *b* an elongated slot *g* is made through the plug to receive the flat metal spring *a* above referred to.

The upper or outer portion *c* of the stopper is made in the form of a ring slightly conical inside to fit over the conical plug or lower portion *b* and is provided underneath with a shoulder or rim *f*, corresponding with the flange *e* before mentioned and forming, when the two parts are put together, the upper portion of the groove in which the india-rubber ring *d* lies. Above this is a flange *c*<sup>x</sup>, projecting, say, about three-eighths of an inch all around, and in the top thereof are formed two square flat recesses *h* to receive the two ends of the flat metal spring *a* above mentioned. The bottom of these recesses is, when the two parts *b* and *c* are placed together, about level with the bottom of the slot *g* through the top of the plug, and the metal spring *a* being bent upward in the form of a bow or arch (see Fig. 1) it will be evident that if the spring be compressed or flattened and pushed through the slot *g*, with its ends resting in the two recesses *h*, as shown, the resilience of the spring *a* will draw the two parts of the stopper together, so as to cause the india-rubber ring *d* to bulge out all around, and thus make an air-tight fit in the mouth of the jar or vessel.

When it is required to remove the stopper, the fingers of the two hands are placed under the opposite sides of the flange *c*<sup>x</sup>, and on pressing the top of the plug *b* down with the two thumbs and at the same time drawing up the flange *c*<sup>x</sup> with the fingers the metal spring *a* will be flattened down in the center



and the two parts of the stopper thrust asunder, thus allowing the india-rubber ring *d* to collapse, so that the stopper can be easily withdrawn. The same action of the fingers and thumbs should also be used to facilitate the insertion of the stopper, and on withdrawal of the hands the metal spring *a* will again assume its arch-like form and cause the india-rubber ring *d* to bulge out all around.

10 As a slight modification of the above we sometimes dispense with the flange *c*<sup>x</sup> at the top of the upper part *c* of the stopper and prolong the ends of the metal spring *a* so as to project beyond the body of the stopper and

15 jar at each side, as shown in section on Fig. 3 and plan view at Fig. 4, in which case the stopper can be released by pulling the ends of the spring *a* upward by the fingers and at the same time pressing the plug downward

20 by the thumbs, so as to separate the two parts. In this case the upper part of the plug may be made entirely of metal or other suitable material.

The metal spring *a* and (in the above-named modification) the metal portion of the stopper may be protected from corrosion by any suitable enameling or other coating which will preserve the same from the corrosive action of acids or moisture.

We claim as our invention—

A bottle-stopper having two parts, a ring *d* held by said two parts, one part (*b*) having a slot *g* and an extended portion passing through an aperture in the other part (*c*), and a spring in said slot, the ends of which are adapted to bear on the part *c* to bulge the ring *d*, substantially as described.

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

E. A. MATTHIAS.  
W. H. HARRISON.

Witnesses:

GEORGE DAVIES,  
CHARLES A. DAVIES.