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G. STAUNTON.

CLOSURE FOR JARS AND OTHER VESSELS.

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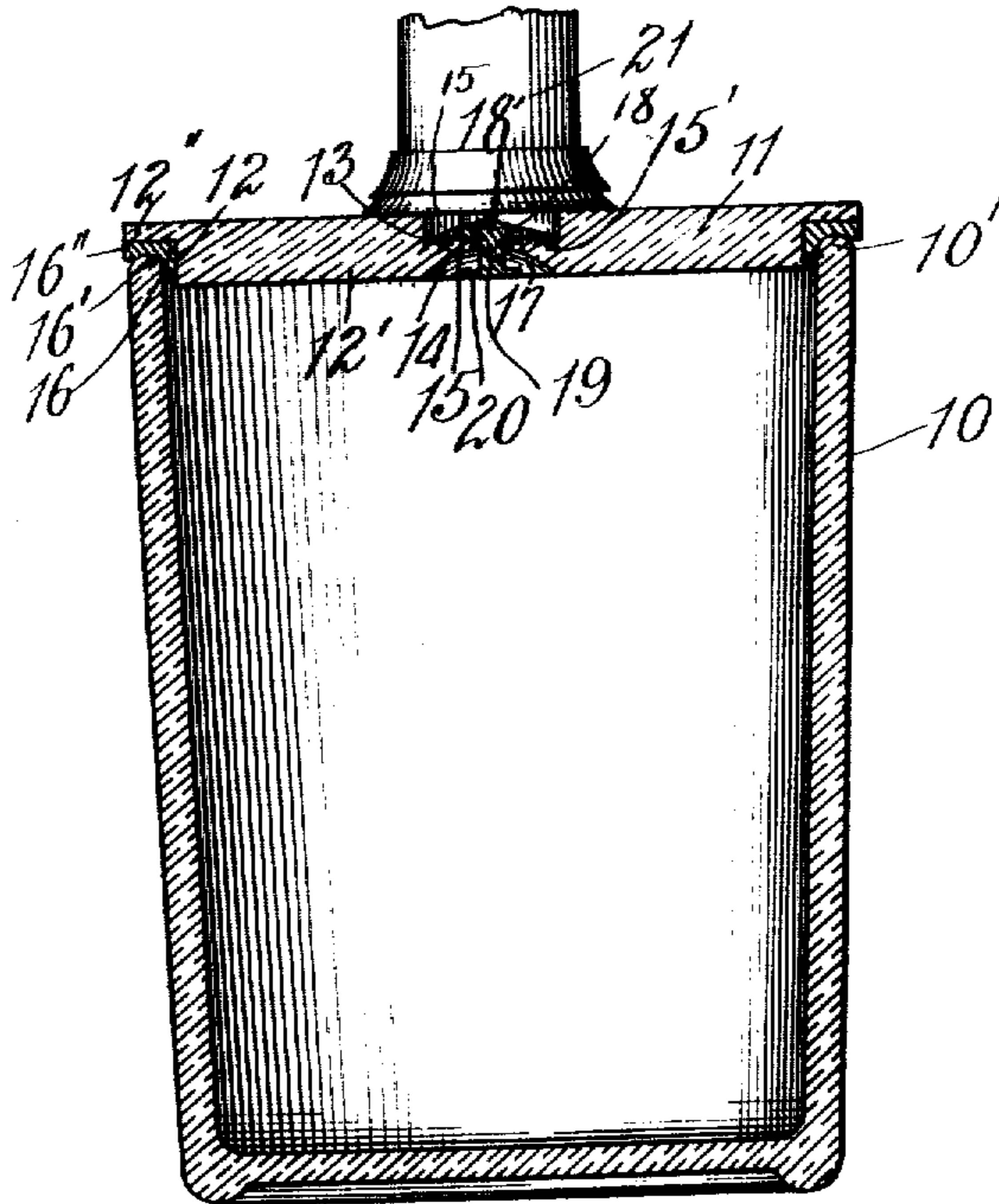


Fig. 1

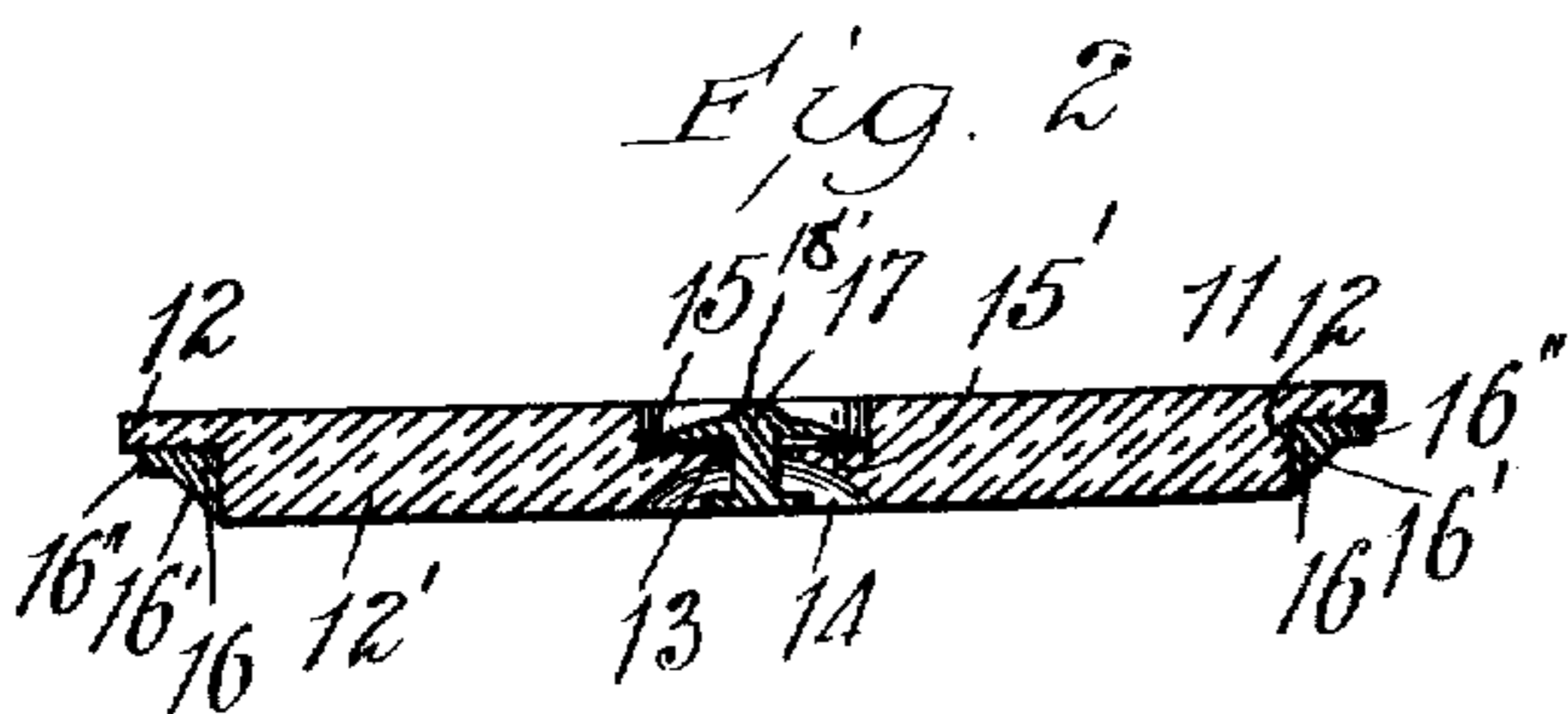


Fig. 2

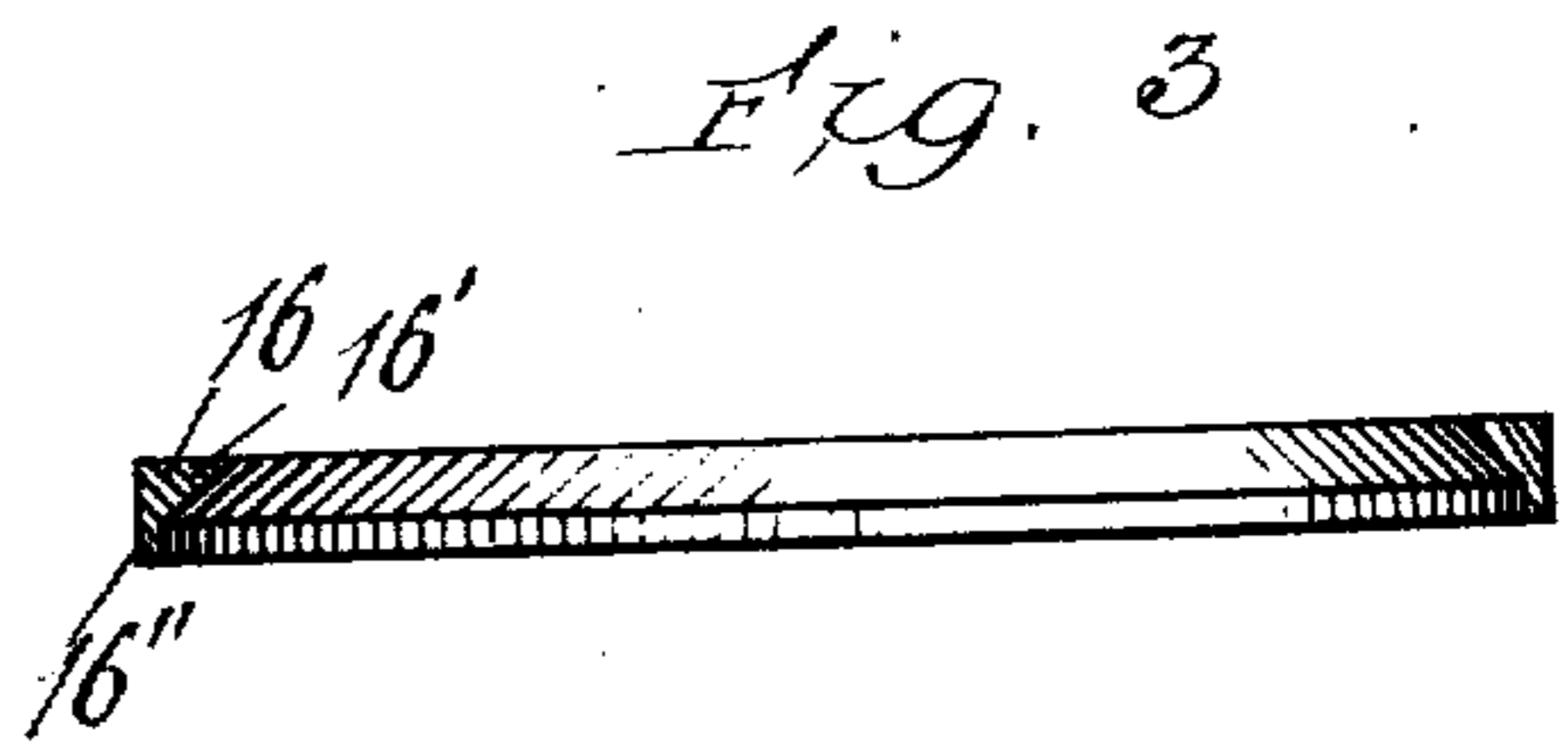


Fig. 3

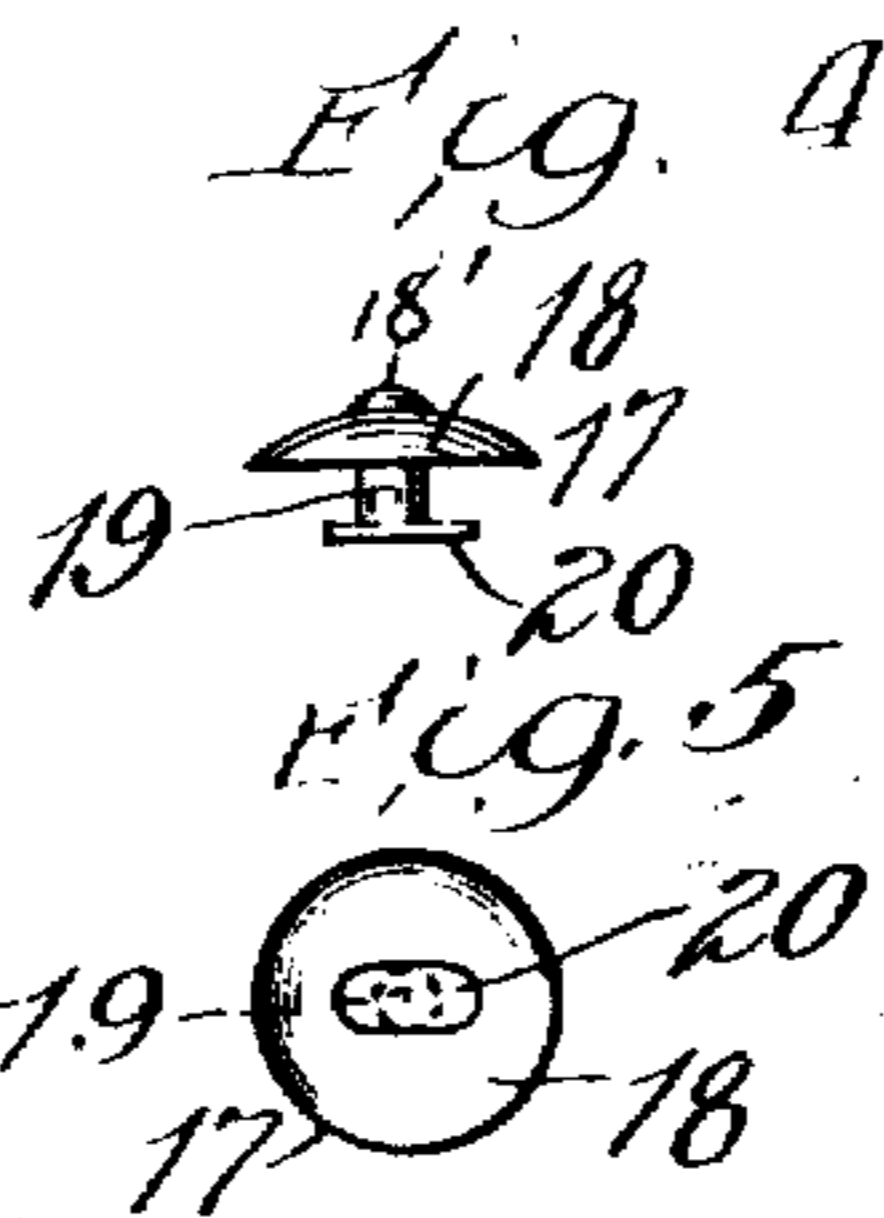


Fig. 4

Fig. 5

Witnesses:
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UNITED STATES PATENT OFFICE.

GRAY STAUNTON, OF CHICAGO, ILLINOIS.

CLOSURE FOR JARS AND OTHER VESSELS.

No. 835,166.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed September 22, 1905. Serial No. 279,830.

To all whom it may concern:

Be it known that I, GRAY STAUNTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Closures for Jars and other Vessels, of which the following is a specification.

My invention relates to improvements in closures for jars and other vessels, and has for its primary object to provide a valve-closure for hermetically sealing jars or other vessels which will be simple in construction, easy of application, efficient and reliable in operation, and cheap of manufacture.

To these and other ends, which will become apparent to those skilled in the art, my invention consists in the features of construction and the combinations and arrangements of parts hereinafter more fully set forth, and specified in the claims.

In the drawings, wherein I have illustrated an operative embodiment of my invention and parts of the completed structure, Figure 1 is a central vertical section of a jar having applied thereto a closure embodying my invention. Fig. 2 is a cross-sectional plan of a closure detached. Fig. 3 is a detail of a sealing-ring before its application to the body of the closure. Fig. 4 is an elevation of the valve in detail. Fig. 5 is a reversed plan thereof.

Throughout the drawings like numerals of reference refer always to like parts.

Referring now to the drawings, 10 indicates a vessel of any suitable size and configuration, the vessel shown having, as is common in preserving-glasses and the like to be purchased on the market, a rounded upper edge 10'. A vessel having this shaped edge is easy of manufacture, but hard to seal, and is therefore chosen by way of illustration, as my closure construction herein claimed enables me to efficiently seal such a vessel, although the closure might obviously be employed with vessels having other shaped edges at the open end thereof.

11 indicates in general the body of the closure, which is preferably made of glass of suitable thickness and is provided around the lower portion of its periphery with an annular recess 12, the walls whereof are at approximately right angles to each other. The recess 12 leaves a central thick body of glass, the protruding part whereof is herein termed the "boss" 12', and a laterally-ex-

tended part, the projecting portion whereof I term the "flange" 12". At some suitable point, preferably centrally of the closure, is located a vent-opening 13, preferably communicating on the under side of the closure with a recess 14 and at its upper side with a suitable recess 15, preferably circular in plan and preferably also having a flat bottom surface, as indicated at 15'.

Associated with the closure-body 11 are a packing or sealing ring, preferably of rubber or similar elastic material, and a valve, also preferably of rubber or the like, adapted when in use to respectively establish a hermetically-tight joint between the closure-body and the vessel and to hermetically seal the vent-opening. The packing or sealing-ring (indicated at 16) is preferably shaped normally or when detached, as shown in Fig. 3, to provide an annulus, whose exterior diameter is approximately that of the boss 12' of the closure-body, and so shaped in cross-section as to provide a flat top and vertical peripheral sides, the inside of the annulus tapering from its maximum radial width at the top to a minimum radial width a short distance from the bottom, and thence extending, preferably, in substantially uniform radial width to the bottom edge, said bottom extension being preferably relatively narrow in a radial direction. Thus there are formed in the annular ring a body 16', tapering inwardly with relation to depth from its bottom to its top, and an annular lip or flange 16", depending from the portion of the tapering body of minimum radial width.

In its application to the body 12 of the closure the right-angular corner of the ring is applied to the similar corner formed by the juncture of the boss 12' of the closure, with that portion of the sealing-ring which is the top in Fig. 3 abutting against the peripheral wall of the boss portion 12', and the edge, which is the periphery of the ring, as shown in Fig. 3, abutting against the under surface of the annular flange 12", the tapering portion 16' of the sealing-ring to this end expanding from its normal diameter to the full diameter of the boss 12' and surrounding the free extremity of said boss. By such application of the ring the latter is put under tension in some of its parts, the tapered portion 16' of the ring being expanded and the lip portion 16" being likewise somewhat expanded, so there is exerted a considerable tension, which tends to hold the ring firmly

in place, the tension at the bottom thereof tending constantly to maintain the ring against slipping downward from the boss 12'. By such arrangement, further, since the portion of the ring fitting into the angle of the groove is not expanded beyond its normal diameter the ring is made easy of application. When applied, it presents, as shown in Fig. 2, an inclined surface extending from a minimum radial diameter substantially equal to that of the boss 12 to a maximum radial diameter, preferably slightly less than that of the top of the closure, and provides a flat outwardly-extending lip 16'', lying immediately beneath the flange 12''. Thus when the closure is applied to the jar, as shown in Fig. 1, there is provided the inclined surface of body 16' for coaction with the edge of the vessel and the projecting portion 16'' to overlie the top thereof to positively prevent contact of the glass of the closure with the glass of the vessel and to provide an effective and tightly-condensed rubber sealing-body on the closure for coaction with the body of the vessel.

The valve (generally indicated at 17) is preferably constructed substantially as shown in Figs. 2, 4, and 5, the valve being preferably made of rubber and of approximately umbrella shape, comprising a head or valve proper, 18, preferably tapering from its center outward and normally of convex-concave shape, as shown in Fig. 2, a central boss 18' upon said head, a stem or shank 19, integrally connected with the head, and flexible spurs 20, projecting from the stem at the bottom thereof. Preferably the valve is of a height over all not in excess of the thickness of the closure 11, so that the valve may fit wholly within the recesses 14 15 and the vent-aperture 13 of the closure. The shank of the valve should be somewhat greater in length than the thickness of the wall intermediate the recesses 14 and 15 of the closure, so as to allow of slight vertical movement of the valve, and is of less diameter than the vent-opening 13. The boss 18' upon the head is preferably about the size of the vent-opening. The valve is inserted in place in the closure by compressing or distorting the flexible spurs 20 and forcing them and the valve-stem through the said opening 13, so that the umbrella-shaped head of the valve lies wholly within the recess 15 and the spurs protrude from the shank within the recess 14, formed therefor in the bottom of the closure. The spurs 20 may readily be so constructed that they resist removal of the valve with sufficient force to prevent its disengagement from the closure during any normal operation of handling the closure, but permit the ready disengagement of the valve when it is intentionally sought to remove the same.

The operation of my improved device is as follows: When it is desired to hermetically seal the vessel, the closure is applied to the

open end thereof and air exhausted from the interior of the vessel. This may be done either by heating the vessel, thereby causing its contents to expand and a portion of the air to force its way through the vent-opening and subsequently permitting the vessel to cool, that the air may contract therein and produce a vacuum tendency, which effects the seating of the valve and the closure upon their respective seating-surfaces, or by mechanical exhaustion of the air, or by a proper combination of both processes.

In the drawings I have shown at 21 a fragment of an exhaust-pump, and it will be understood that by such means air may be drawn through the vent-opening 13, the valve rising with each suction-stroke of the pump-plunger, thereby decreasing the pressure within the vessel, so that the overbalancing exterior air-pressure forces the closure 11 tightly upon the vessel 10, pressing to some extent the sealing-ring 16, causing it to effect a hermetically-tight joint between the vessel and closure-body and with each downstroke of the pump-plunger seating the valve 17 upon its flat surface 15' with considerable pressure. It will be apparent now that when the valve 17 is thus forcibly seated the central portion of its umbrella-head, crowding under pressure down against the edges of the vent-aperture 13, as shown in Fig. 2, causes the flattening of the normally cup-shaped umbrella and the consequent expansion to a slight extent of the thin peripheral edge of the head. This flattening of the cup-shaped head causes its edge portion to press slightly against the seating-surface 15' therebelow and affords an effective and air-tight joint, by which slight irregularities in the seating-surface are compensated for. Furthermore, the boss 18' tends to wedge the rubber tightly in the vent-opening to make a tight fit with the edges of the vent.

While I have herein described in some detail the specific embodiment of and manner of combination of the parts of my invention which I deem to be novel and advantageous, it will be apparent that slight changes might be made in the specific structure and arrangement without departure from the spirit and scope of my invention. It will further be apparent that while I have shown glass as the material of which the vessel and closure-body are made they might be made of any other hard impervious material, and the invention herein disclosed is adaptable to any size and shape of vessel and closure. Hermetically-closable vessels of this general character have many uses, but are particularly desirable as a means for preserving food-stuffs and the like.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A closure for vessels comprising a rigid

body having a depending boss, and outwardly-extending overhanging flange, and a sealing-ring surrounding said boss, said ring being tapered in cross-section, with its thin edge downward, and having its thin edge under tension when applied to the boss.

2. A closure for vessels comprising a rigid body having a central boss and a surrounding overhanging flange, and a sealing-ring normally tapering from a maximum depth or thickness at its outer periphery, to a minimum depth at its inner edge, applied to said boss with its thin edge toward the free extremity of the boss, whereby the thin edge of said ring exerts a self-retaining tension on said boss.

3. A closure for vessels comprising a rigid body portion having a depending boss and an overhanging annular flange, and a sealing-ring surrounding said boss comprising an outwardly-inclined body portion radially narrowest at the bottom and radially widest at the top, and an outwardly-projecting flange portion immediately underlying the flange of the closure-body.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

GRAY STAUNTON.

In presence of—

GEO. T. MAY, Jr.,
MARY F. ALLEN.