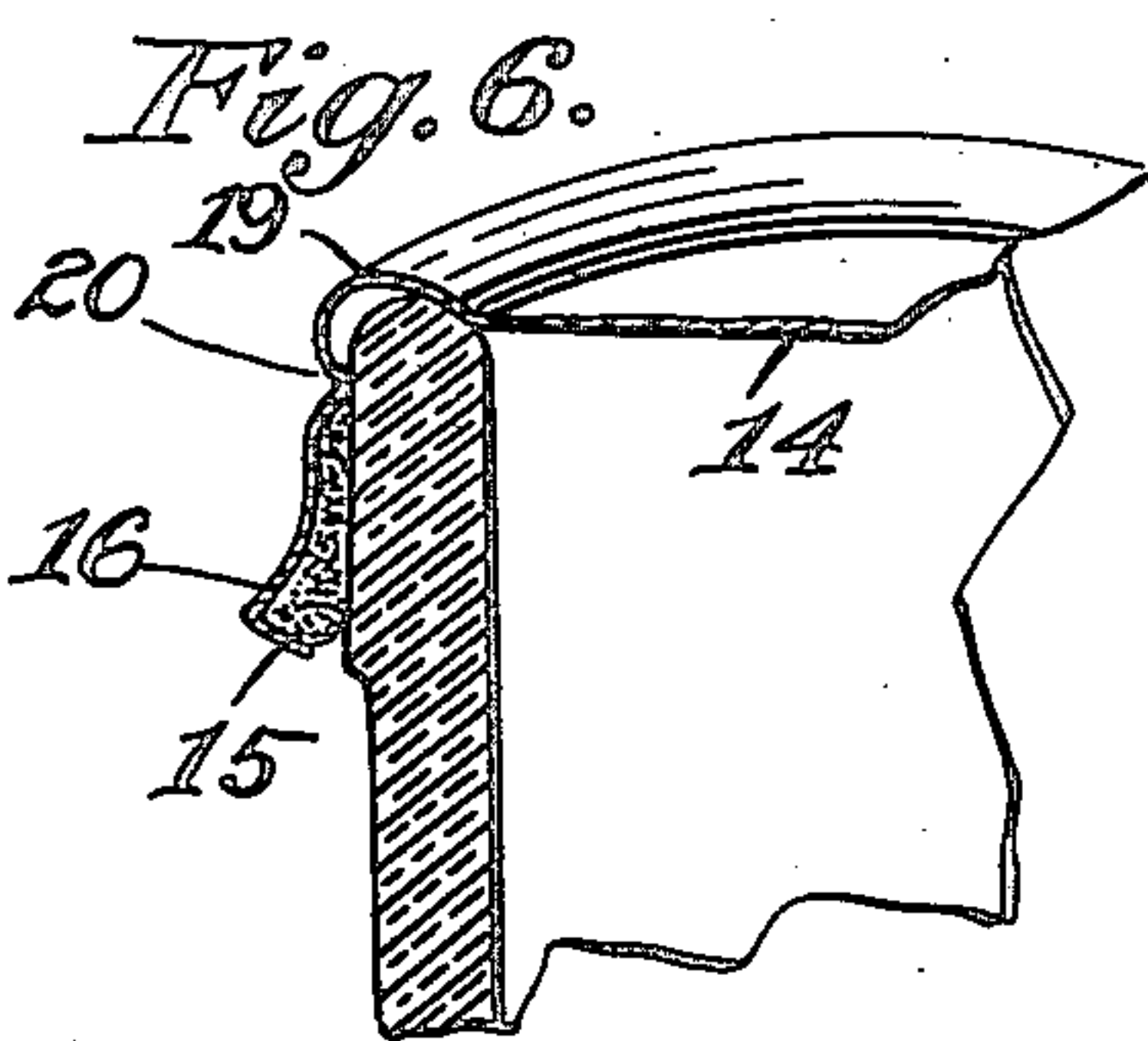
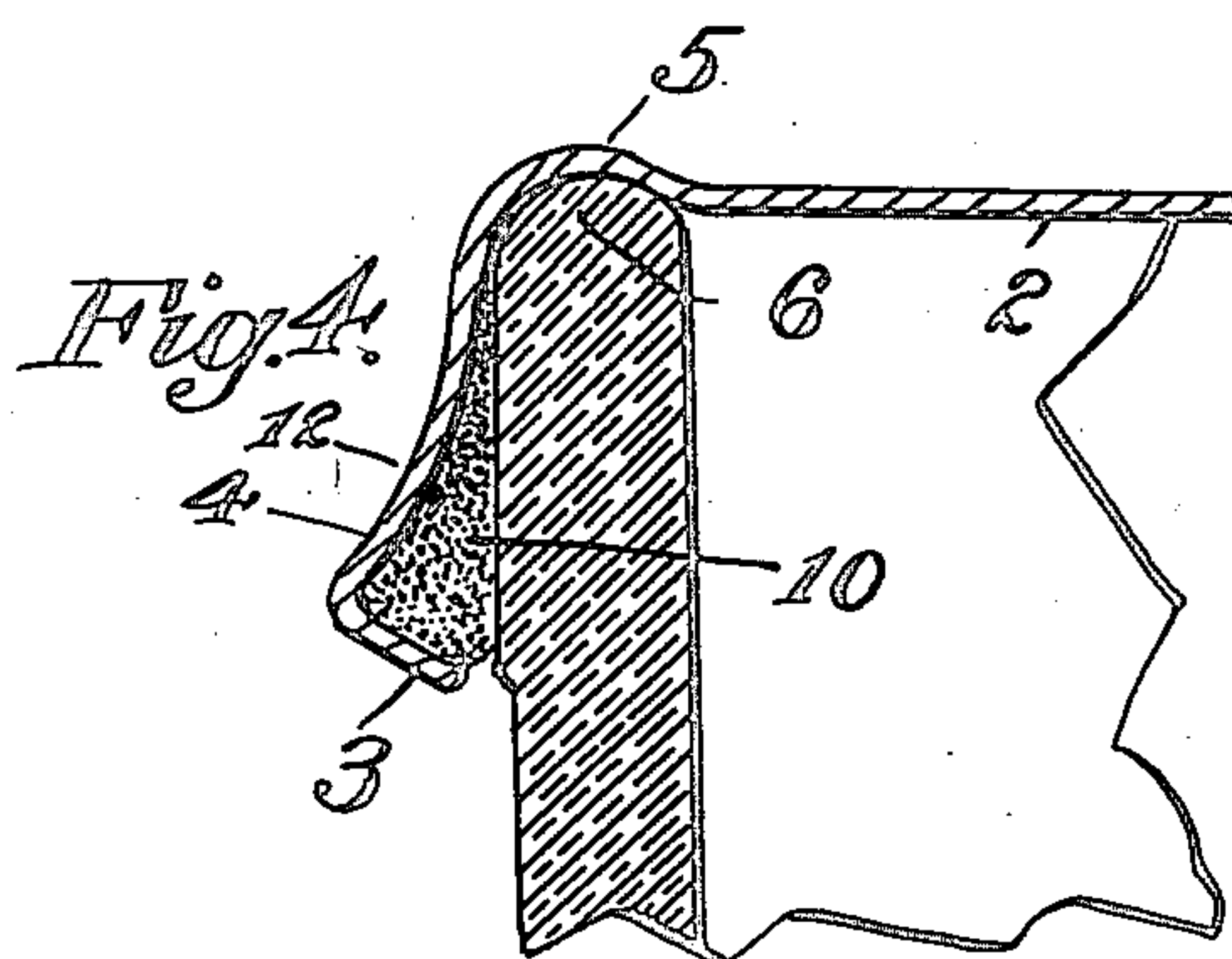
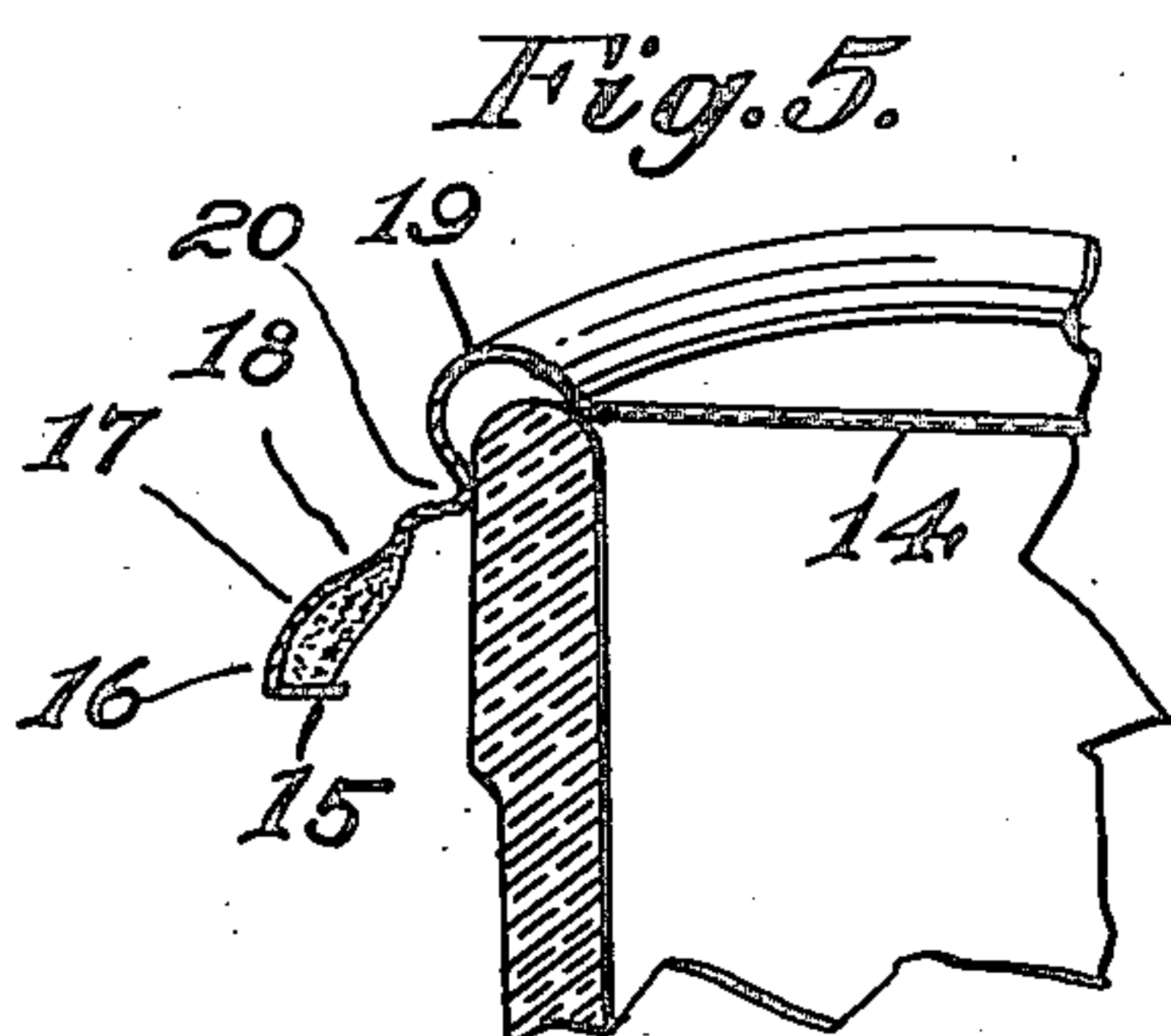
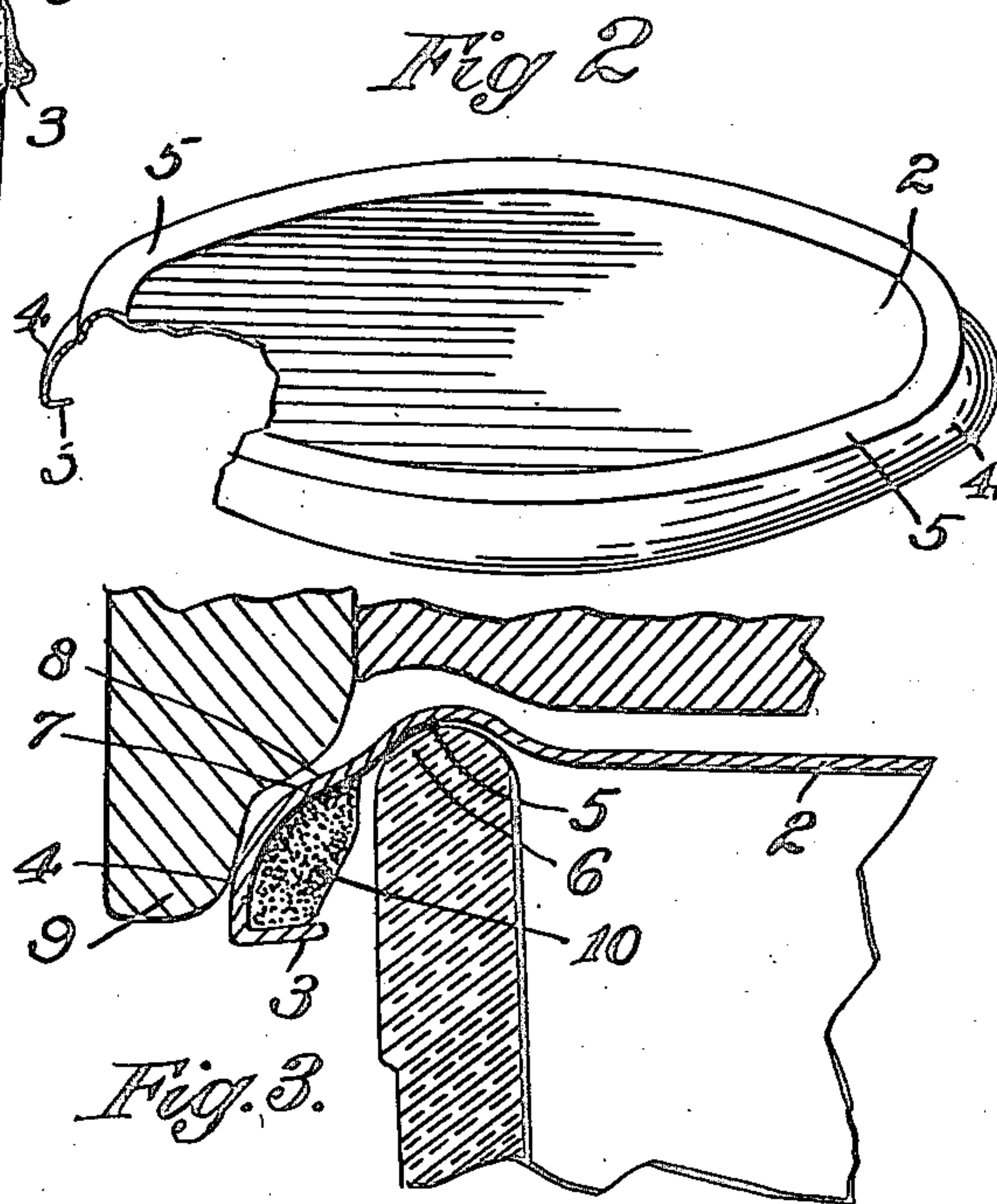
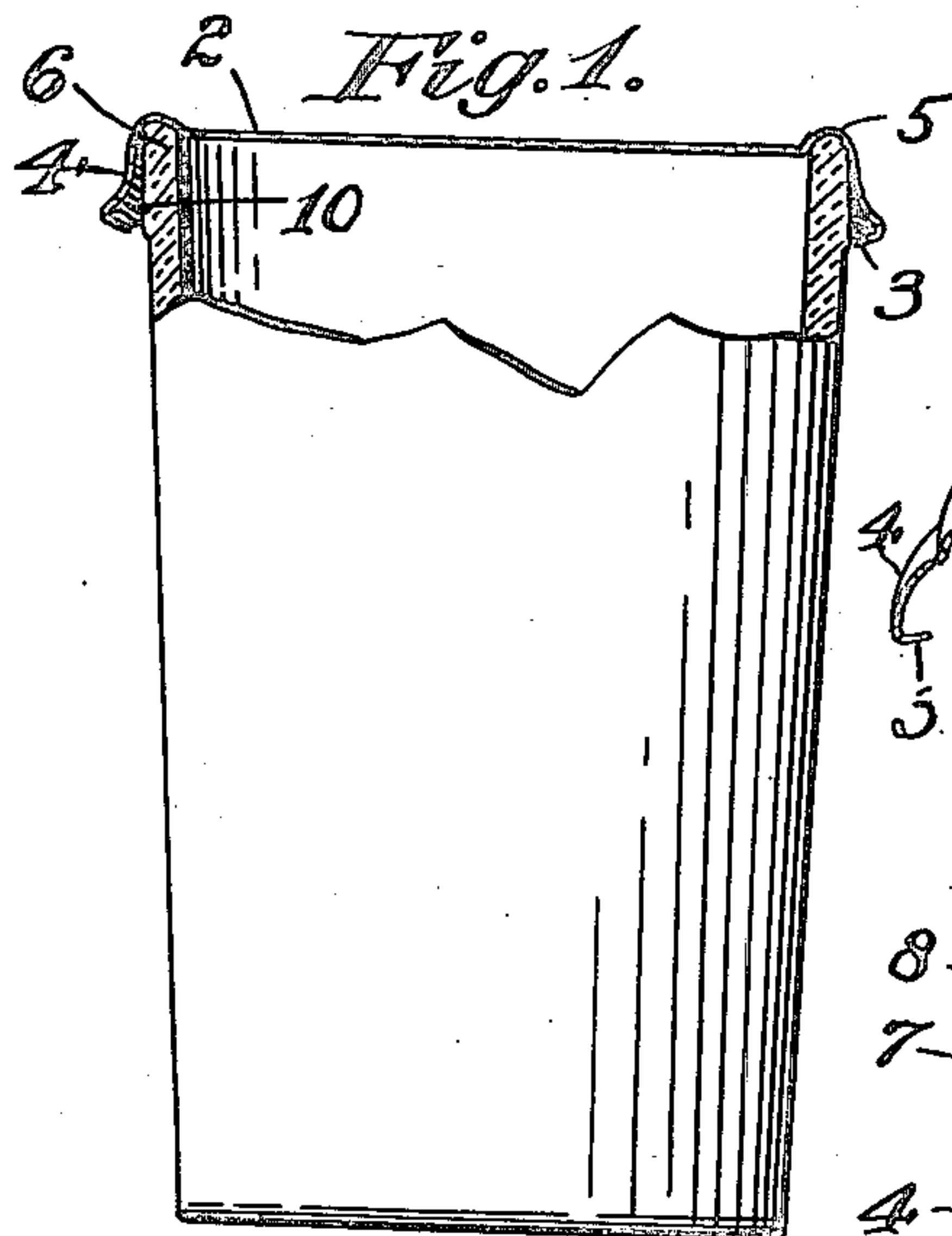


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1,440,986

C. HAMMER.
VACUUM JAR CLOSURE.
FILED MAY 25, 1921.



Inventor
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By his Attorney
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UNITED STATES PATENT OFFICE.

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VACUUM JAR CLOSURE.

Application filed May 25, 1921. Serial No. 472,447.

To all whom it may concern:

Be it known that I, CHARLES HAMMER, a citizen of the United States, and a resident of Queens, in the county of Queens and State of New York, have invented certain new and useful Improvements in Vacuum Jar Closures, of which the following is a specification.

This invention relates to closures for containers, such as tumblers or wide-mouthed jars, and is of the character that is forced down on the container by a suitable sealing member, such as a ring chuck, with a compressible sealing ring or gasket located between the closure flange and the jar outer wall at the top; and which is secured in such position by the flange of the closure being re-formed to strongly compress the gasket between the flange and the jar wall.

One object of this invention is to provide an improved closure of this character, that is secured in sealing position on the jar by merely pressure vertically downward by a suitable sealing member, such as a ring chuck, that will cause the flange wall to be re-formed and very strongly and securely hold the closure on the jar, by the compression of the gasket between the re-formed flange and the jar wall; and whereby the use of a special sealing member such as one having rotary arms carrying rolls, is obviated and simple downward pressure will produce the sealing.

A further object of the invention is to provide in a closure of this character, a form of bead or channel in the flange, that will serve to loosely hold or retain the sealing gasket in the flange before sealing by having an open angular form; which angular form during the sealing operation maintains its particular angular shape, but is so shifted in position that the angular portion will face downward in the sealed closure, instead of upwardly as when first applied.

A further object of the invention is to provide in combination with a closure of the character set forth, an extension above the gasket-receiving portion that is provided with an inwardly extending bead, that is adapted to have a frictional engagement with the jar wall on forcing the closure down on the jar, and which will itself have a holding engagement with the jar wall without having its shape changed by the sealing member, but merely engage the jar

by reason of a slight reduction of internal diameter over that of the jar wall where engaged by the bead.

One of the important objects of the present invention is the provision of a metal closure for hermetically sealing a glass container, which closure comprises a top having a depending flange having at its lower edge an inwardly bent channel-forming portion so located and positioned relatively to the flange that it will hold a gasket in place, but which channel-forming portion is, during the reformation of the depending flange, also reformed by the sealing pressure into a different position so that it will efficiently hold and seal the gasket on the jar, and at the same time enable the closure to be hermetically sealed, so that without applying any direct pressure to the gasket holding portion it nevertheless has its position, as it were, changed.

In the accompanying drawing illustrating embodiments of my invention, Figure 1 shows a jar with the closure sealed thereon, being in vertical section at the upper part.

Fig. 2 is a perspective view of the closure, partly in section.

Fig. 3 is a sectional view enlarged at one side of the closure and jar, showing the application of the cap by suitable means.

Fig. 4 is a similar view with the closure in sealed position.

Fig. 5 shows a modification as first applied.

Fig. 6 shows the latter in sealing position.

As set forth, the closure comprises a top 2, from which depends an annular flange or rim, and which device is made of comparatively thin sheet metal. The flange is shown as having at the lower portion a substantially V-shaped angular gasket-retaining channel, that is formed by a bottom wall 3 shown as flat in section, in annular contour being substantially conical. This wall which is the free bottom portion of the flange, connects with the upper wall 4 of the channel portion, meeting at a comparatively sharp angle as shown. The wall 4 is also substantially conical in annular contour adjacent the angle, but at its upper portion it curves inwardly, so that it is convex on the outer portion; and thereupon extends inward to connect with the top wall 2. In the preferred form, the top 2 is furnished with an

arch portion 5 at its outer part, adapted to engage the top rounded edge of the jar wall 6, see Figs. 3 and 4. This arch portion 5 merges into the convex portion 7 of the outer wall 5, to form a slight depression or shoulder at 8 as shown. The purpose of the latter is to receive the thrust of a sealing ring 9, that may be forced downwardly to engage the walls 4 and 7.

The gasket 10 of compressible material such as rubber or composition, is placed inside of the flange and will rest loosely on the lower wall 3 of the angular portion, as indicated in Fig. 3. This gasket may be of any preferred sectional shape.

Upon placing the closure on the jar, as indicated in Fig. 3, and applying pressure vertically downward on the convex portion 7 and shoulder 8, the entire flange portion is re-formed and changes its shape to that indicated in Fig. 4, the wall 3, that extended upward relative to the top plane of the cap, now extending downwardly. But it will be observed that the lower angular wall 3 still maintains approximately the same angle with the adjacent wall 4, so that this channel is not itself re-formed but merely changes its position. The convex wall 7 in the flange, has now become a concave wall 12, extending from the upper angular wall 4 of the channel to the arch portion 5, that is now slightly flattened to engage the rounded edge of the jar, as shown in this figure. Since the angular V-shape channel has been forced inwardly the gasket 10 will be strongly compressed between this channel, and the opposite side wall of the jar and will be somewhat extended upwardly between the concave wall 12 and the jar wall, as shown. By this sealing operation, the walls 4 and 7 are moved inwardly a considerable distance, whereby the angular portion or channel is moved nearer to the jar wall, as will be apparent by comparing Figs. 3 and 4. It will be also seen that the lower angular wall 3 is still spaced from the jar wall and does not engage the same. This will leave a small portion of the gasket exposed, that will facilitate the use of a suitable sharp implement to loosen and remove the closure, that can be forced into the exposed gasket and serve to pry out the flange and to loosen the gasket. A closure of this character has been found, by repeated use, to have a very strong grip on the jar, by reason of the rather long concave portion that is forced inwardly with a compression of the metal walls, as well as the sharp angular portion that serves to retain the gasket in its compressed position.

In Figs. 5 and 6 is shown a modification in which substantially the same arrangement of flange and gasket is provided, but an extension is provided between the arch portion and the shoulder portion, that contains an inwardly extending bead or rib, for the

purpose of having a frictional binding engagement with the wall of the jar at this place. As shown in Fig. 5 the closure has a flat top portion 14, and the flange at the bottom is the angular portion formed by conical walls 15 and 16, the latter having a convex portion 17 and a shoulder at 18. The arch portion 19 of the top connects with the shoulder portion 18, by a comparatively small inwardly extending bead or rib 20, as shown. When this closure is applied to a jar, the bead will first engage the jar wall by reason of its internal diameter or distance apart at opposite portions, being slightly less than the diameter of the jar wall. The flange below the bead is engaged by the sealing ring or other member and forced downwardly and re-formed to compress the gasket, as shown in Fig. 4, while at the same time the bead 20 will have a strong frictional engagement with the jar wall and assist in retaining the closure in sealed position.

In a patent granted to me July 3, 1917, No. 1,231,881, is set forth a closure in which the gasket is compressed between the flange and the jar wall, with a sealing bead arranged below the gasket for frictional engagement with the jar wall. In another patent of mine 1,335,054, a sealing bead also engages the jar wall frictionally, and above the bead is a gasket that is pressed against the jar wall. But in the present invention the bead shown in Fig. 5 is arranged at the upper part of the flange, while below the bead the gasket is compressed between the flange and the jar wall. Various changes in and modifications of the construction herein set forth may be made without departing from the spirit of this invention or sacrificing its advantages.

What I claim is:

1. A metal cap provided with a depending flange having the lower edge thereof turned in to form an annular transverse wall adapted to receive a gasket, said wall having a width at least as great as the thickness of the gasket and having the major portion thereof lying outside of the inner periphery of the gasket before application of the cap to the jar.

2. A metal cap provided with a depending flange having the lower edge thereof turned in to form an annular transverse wall adapted to receive a gasket, said wall having a width at least as great as the thickness of the gasket and having the major portion thereof lying outside of the inner periphery of the gasket before application of the cap to the jar, the construction being such that the sealing pressure on the cap will transform the inturned edge from one angular position relatively to the flange to a different angular position relatively to said flange.

3. A metal cap provided with a depending

flange having the lower edge thereof turned in to form an annular wall adapted to receive a gasket, said wall having a width at least as great as the thickness of the gasket and having the major portion thereof lying outside of the inner periphery of the gasket before application of the cap to the jar, said flange having an inwardly extending bead above the gasket for frictional engagement with the side of the container.

4. A metal cap provided with a depending flange having the lower edge thereof turned in to form an annular wall adapted to receive a gasket, said wall having a width at least as great as the thickness of the gasket and having the major portion thereof lying outside of the inner periphery of the gasket before application of the cap to the jar, the construction being such that the sealing pressure on the cap will transform the in-turned edge from one angular position relatively to the flange to a different angular position relatively to said flange, said flange having an inwardly extending bead or rib above the gasket for frictional engagement with the side of the container.

5. A metal closure for hermetically sealing a glass container comprising a top having a depending flange having an inwardly bent channel forming portion at its lower edge adapted to receive a gasket, the sealing pressure on the closure adapted to transform the position of the channel-forming portion into a different position and the depending flange into a different shape relatively to each other and the container.

6. A metal closure for hermetically sealing a glass container comprising a top having a depending flange having an inwardly bent channel-forming portion at its lower edge adapted to receive a gasket, the sealing pressure on the closure adapted to transform the position of the channel-forming portion into a different position and the depending flange into a different shape relatively to each other and the container, said flange having an annular container engaging bead above the gasket.

7. A metal closure for hermetically sealing a glass container comprising a top having a depending flange provided at its lower edge with an inwardly and upwardly bent channel-forming portion adapted to receive a gasket and located at a predetermined angle to the flange, the construction being such that on the application of a sealing pressure to the closure, said bent portion will be forced from its normal position to a downward position.

8. A metal closure for hermetically sealing a glass container comprising a top having a depending flange provided at its lower edge with an inwardly and upwardly bent channel-forming portion adapted to receive a gasket and located at a predetermined

angle to the flange, the construction being such that on the application of a sealing pressure to the closure, said bent portion will be forced from its normal position to a downward position but having substantially the same angle relatively to the flange.

9. A metal closure for hermetically sealing a glass container comprising a top having a normally outwardly flared depending flange provided at its lower edge with an inwardly and upwardly bent channel-forming portion adapted to receive a gasket and located at a predetermined angle to the flange, the construction being such that upon the application of sealing pressure to the cap the flange will be forced toward the container and said bent portion will be forced from its normal position into a downward position while retaining however substantially the same angle relatively to the flange.

10. A metal closure for hermetically sealing a glass container comprising a top having a normally outwardly flared depending flange provided at its lower edge with an inwardly and upwardly bent channel-forming portion adapted to receive a gasket and located at a predetermined angle to the flange, the construction being such that upon the application of sealing pressure to the cap the flange will be forced toward the container and said bent portion will be forced from its normal position into a downward position while retaining however substantially the same angle relatively to the flange, said flange having a sealing bead or rib above said gasket.

11. A metal closure for hermetically sealing a glass container comprising a top having a convex walled depending flange adapted by sealing pressure to be transformed into a concave walled flange, said flange having at its lower edge a bent channel forming portion adapted to receive a gasket and located at a predetermined angle to the flange, said bent channel-forming portion being adapted to have its angular position relatively to the flange changed during the transformation of the depending flange from a convex walled flange to a concave walled one.

12. A metal closure for hermetically sealing a glass container comprising a top having a convex walled depending flange adapted by sealing pressure to be transformed into a concave walled flange, said flange having at its lower edge a bent channel-forming portion adapted to receive a gasket and located at a predetermined angle to the flange, said bent channel forming portion being adapted to have its angular position relatively to the flange changed during the transformation of the depending flange from a convex walled flange to a concave walled one, said depending flange also having above the gasket a sealing rib or bead.

13. A metal closure for hermetically sealing a glass container comprising a top having a depending side wall having at its lower edge an inwardly projecting bent portion
5 located at an angle to said side wall and adapted to receive a gasket, the construction being such that on the application of a sealing pressure to the closure said bent portion will be forced from its normal position into
10 a downward position.

14. A metal closure for hermetically sealing a glass container comprising a top having a depending side wall having at its lower edge an inwardly projecting bent portion
15 located at an angle to said side wall and adapted to receive a gasket, the construction being such that on the application of a sealing pressure to the closure said bent portion will be forced from its normal position into
20 a downward position and the side wall into a different shape.

15. A metal closure for hermetically sealing a glass container comprising a top having a depending side wall having at its lower edge an inwardly projecting bent portion
25 located at an angle to said side wall and adapted to receive a gasket, the construction being such that on the application of a sealing pressure to the closure said bent portion will be forced from its normal position into
30 a downward position, said flange having above the gasket a container engaging sealing bead or rib.

16. A metal closure for hermetically sealing a glass container comprising a top having a depending side wall having at its lower edge an inwardly projecting bent portion located at an angle to said side wall and adapted to receive a gasket, the construction being
40 such that on the application of a sealing pressure to the closure said bent portion will be forced from its normal position into a downward position and the side wall into a different shape, said flange having above the
45 gasket a container engaging sealing bead or rib.

17. A sealed package comprising a glass container and a closure comprising a top having a depending flange provided at its
50 lower edge with an inwardly extending downwardly bent portion terminating in a free edge adjacent to the container and forming with the flange a channel receiving portion and a gasket located therein and
55 strongly compressed against the container wall.

18. A sealed package comprising a glass container and a closure comprising a top having a depending flange reformed from a
60 concaved wall flange and provided at its lower edge with an inwardly extending downwardly bent portion terminating in a free edge adjacent to the container and forming with the flange a channel receiving
65 portion, and a gasket located therein and

strongly compressed against the container wall.

19. A sealed package comprising a glass container and a closure comprising a top having a depending flange reformed from a
70 concaved wall flange and provided at its lower edge with an inwardly extending downwardly bent portion terminating in a free edge adjacent to the container and forming with the flange a channel receiving
75 portion, and a gasket located therein and strongly compressed against the container wall, said flange having above said deformed portion a container engaging sealing bead or
80 rib.

20. A closure for a jar that has a substantially straight outer wall at the top, comprising a top having an arch portion at the margin arranged to engage the top rounded
85 edge of the jar, and a skirt or flange portion projecting downwardly and outwardly from the arch portion, with a substantially V-shape angular gasket-retaining channel at the lower portion with the lower free wall of the angular portion extending inwardly
90 and also upwardly relative to the plane of the closure top wall, the flange above the angular channel portion being curved convex outwardly and merging into the lower part of the arch portion to provide a
95 shoulder for engagement with a chuck or sealing ring, and a ring gasket loosely resting on the lower wall of the angular portion and engaging the inner wall of the said curved portion below the shoulder, whereby
100 downward pressure on the shoulder portion and convex wall will cause inward movement of the convex portion and also of the said angular channel portion so that the lower marginal wall of the channel portion
105 will project inwardly and downwardly relative to the plane of the wall of the closure, and the flange from the arch portion will extend downwardly in a substantially straight conical form to merge into the up-
110 per wall of the said angular channel portion that will extend outwardly therefrom, and the gasket will be strongly compressed between the jar wall, and the angular channel portion and flange above the channel
115 portion.

21. A sealed package comprising a jar that has a substantially straight outer wall at the top, and a closure composed of a top having an arch portion at the margin arranged to engage the top rounded
120 edge of the jar, and a skirt or flange portion projecting downwardly and outwardly from the arch portion, with a substantially V-shape angular gasket-retaining channel at
125 the lower portion with the lower free wall of the angular portion extending inwardly and also downwardly relative to the plane of the closure top wall, the flange below the arch portion being extended downwardly
130

in a substantially straight conical form to merge into the upper wall of the angular channel portion that will extend outwardly therefrom, and a gasket strongly compressed between the said jar wall, and the annular channel portion and flange above the channel portion.

22. A closure for a jar comprising a top and a skirt or flange portion projecting downwardly and outwardly with a substantially V-shape angular gasket-retaining channel at the lower portion with the lower free wall of the angular portion extending inwardly and also upwardly relative to the plane of the closure top wall, the flange above the angular channel portion being curved convex outwardly and merging into the upper portion to provide a shoulder for engagement with a chuck or sealing ring, and a ring gasket loosely resting on the lower wall of the angular portion and engaging the inner wall of the said curved portion below the shoulder, whereby downward pressure on the shoulder portion and convex wall will cause inward movement of the convex portion and also of the said angular channel portion so that the lower marginal wall of the channel portion will project inwardly and downwardly relative to the plane of the wall of the closure, and the flange will extend downwardly in a substantially straight conical form to merge into the upper wall of the said angular channel portion that will extend outwardly therefrom, and the gasket will be strongly compressed between the jar wall, and the angular channel portion and flange above the channel portion.

23. A closure for a jar comprising a top and a skirt or flange portion projecting downwardly with an inwardly projecting annular bead adapted to frictionally engage the jar wall, the flange below the bead portion extending downwardly and outwardly with a substantially V-shape angular gasket-retaining channel at the lower portion with the lower free wall of the angular portion extending inwardly and also upwardly relative to the plane of the closure top wall, the flange above the angular channel portion being curved convex outwardly and merging into the lower part of the upper portion to provide a shoulder for engagement with a chuck or sealing ring, and a ring gasket loosely resting on the said lower wall of the angular portion and engaging the inner wall of the said curved portion below the shoulder, whereby downward pressure on the shoulder portion and convex wall will cause inward movement of the convex portion and also of the said angular channel portion so that the lower marginal wall of the channel portion will project inwardly and downwardly relative to the plane of the top of the closure, and the flange from the upper portion will extend downwardly in a substantially straight conical form to merge into the upper wall of the said angular channel portion that will extend outwardly therefrom, and the gasket will be strongly compressed between the jar wall, and the angular channel portion and flange above the channel portion.

Signed at New York city, N. Y., on May 18, 1921.

CHARLES HAMMER.