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CAPSEAL

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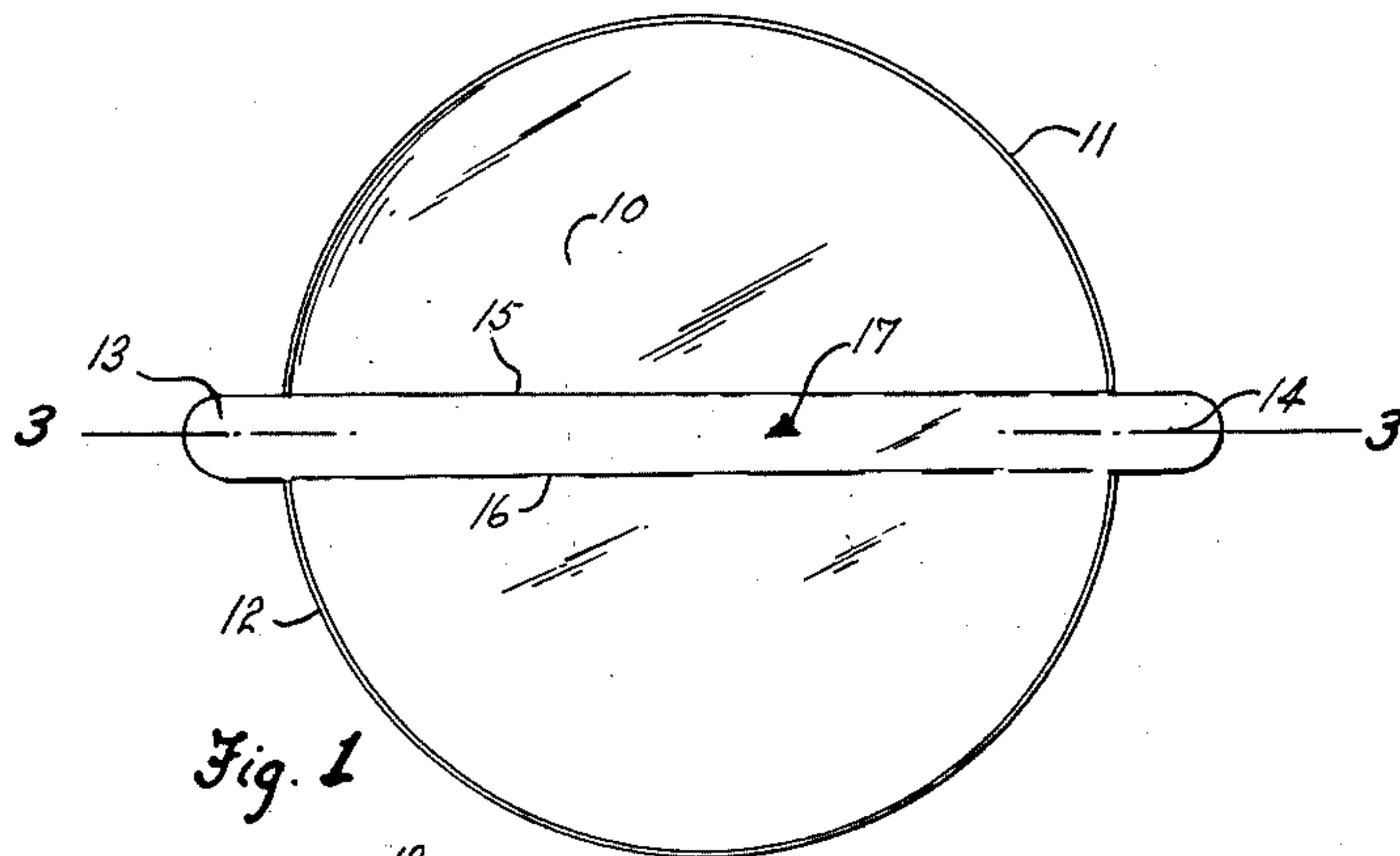


Fig. 1

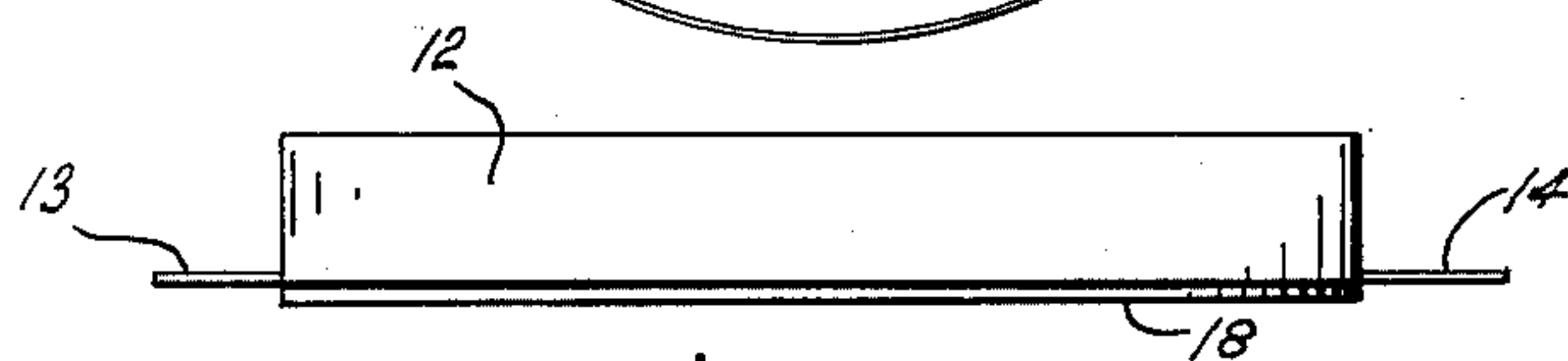


Fig. 2

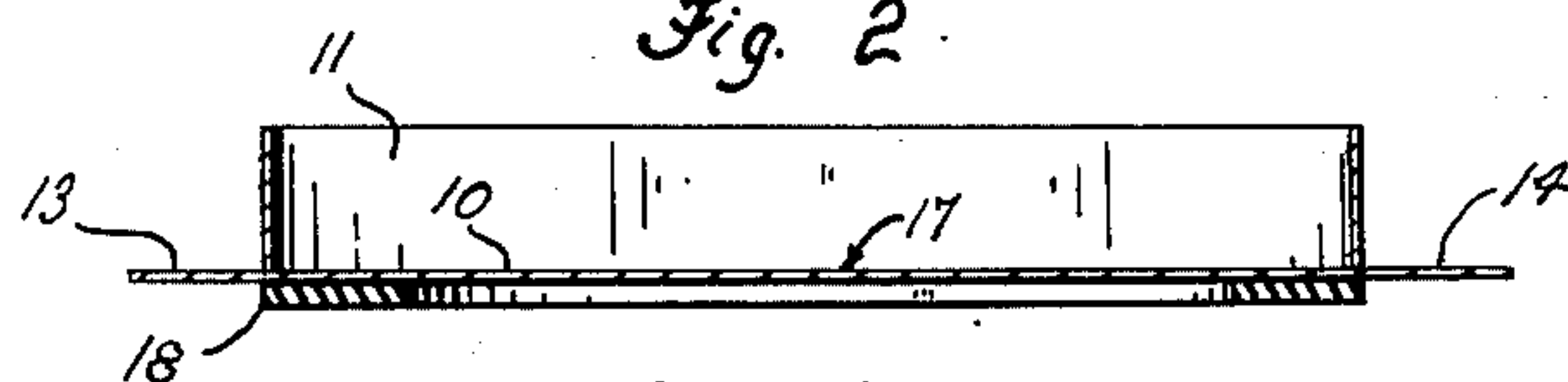


Fig. 3

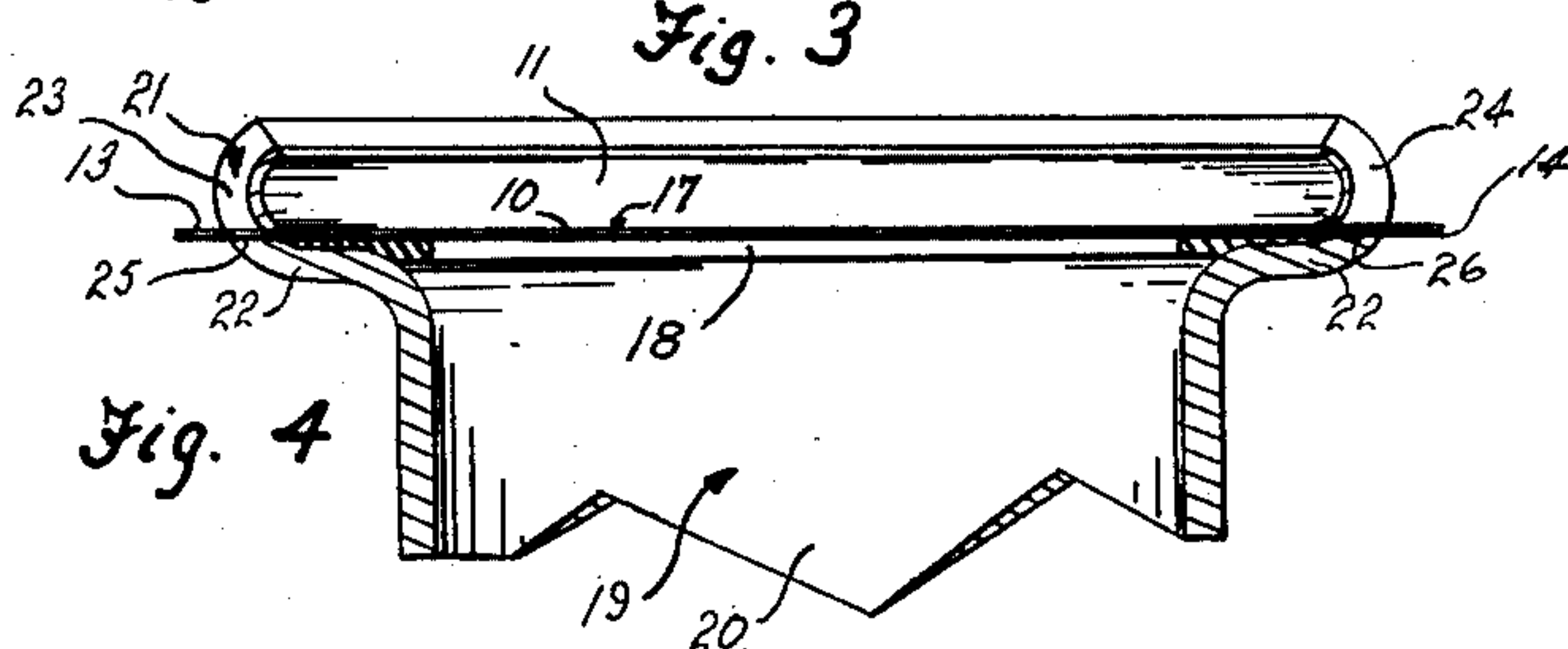


Fig. 4

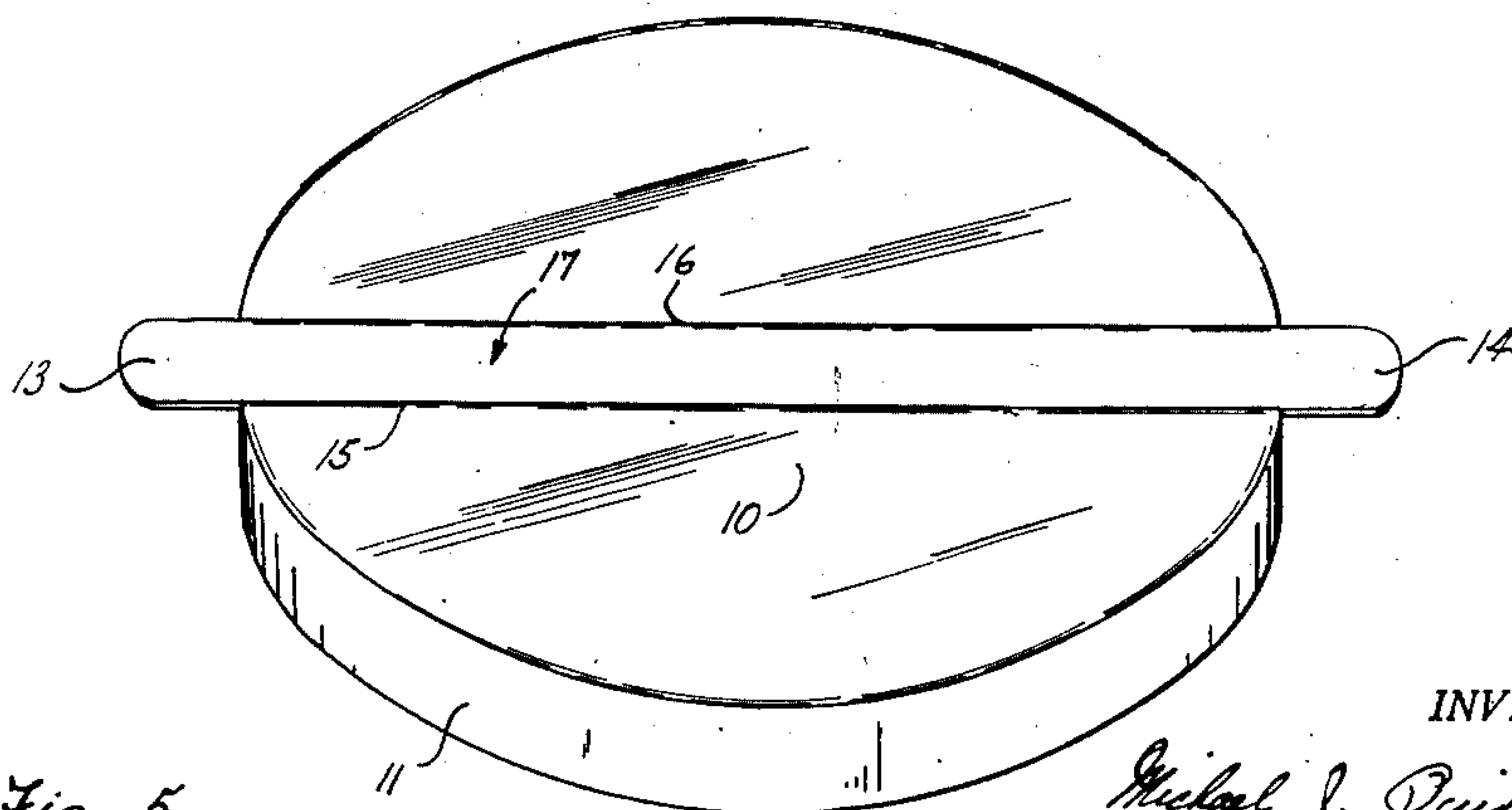


Fig. 5

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CAPSEAL

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5 Claims. (Cl. 220—27)

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The present invention relates to capseals used in sealing containers and, in particular, to a new and improved method of sealing container wall openings no matter what the material thereof may consist.

Briefly, the capseal referred to consists of a flat disc-like bottom and a cylindrical wall portion. Located about the wall portion are a number of slots or gaps whereat the continuity of the wall portion is interrupted. Tearing ears protrude laterally outward through the aforementioned slots from the capseal bottom portion. On the under face of the capseal may optionally be located a gasket depending upon the sealing function to which the capseal may be put, as will hereinafter be elaborated upon. By tucking the capseal's wall portion within the confines of a curled recessed annulus with the operable portions of an appropriate sealing tool, there is a resulting downward displacement of the capseal, and of the capseal gasket where provided, upon a capseal receiving seat. Ready removal of the capseal is facilitated by gripping the above mentioned tearing ears and cleaving the fixedly retained capseal along an area of localized frangibility.

Depending upon the varied uses of capseals, they should, in addition to superior sealing qualities, combine the desirable features of strength and durability with facility of removal. Oftentimes, it becomes difficult to secure such capseals in place upon the container opening with a minimum of operational force without compromising the above-mentioned desirable features. Furthermore, the means used in holding the capseal in sealing relation with its respective closure are weakened as regards their apparent advantages when the features of non-access and ease of removal must also be incorporated into the same capseal design. Finally, in addition to the above elements dictating capseal design, features of capseal economy require that the material thereof be of the lightest possible gauge without imperiling sealing integrity. This latter feature becomes even more critical when it is desired to combine the features of frangibility and economy of capseal design without imperiling capseal strength and durability. Should capseal material of substantially high rigidity be used, it becomes increasingly difficult not only to secure the capseal in place on the closure, but also to remove the capseal by the universally practicable means of cleaving the capseal in an area of localized frangibility.

Accordingly, one of the primary objects of the invention is to provide a capseal that is strong and durable and readily removable despite a high degree of permanence provided by the capseal securing means.

Another primary object of the invention is to provide a capseal that is strong and durable and

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yet possesses securing means that allow a minimum of operational force in securing the capseal in sealing position on the closure

Another object of the invention is to provide a permanent capseal, both strong and durable, having mutable wall portions that secure the capseal rigidly in place within the confines of the closure opening with a minimum of operational force.

Another object of the invention is to provide a capseal with securing means which furnish a high degree of capseal gasket compression and capseal permanence with a minimum of sealing force.

Another object of the invention is to provide a capseal that is structurally efficient in sealing a closure and unequivocally shows evidences of unauthorized attempts at access to the contents of the container.

Another object of the invention is to provide an economical capseal that permanently seals a container closure opening within the confines of the same, thus using the structural qualities of the closure to guard against untoward blows directed at the capseal and still provides simple and effective means for capseal removal.

Still another object of the invention is to provide an economical capseal which, though strong and durable, is cleavable with a minimum of force on an area of localized frangibility.

Other objects and desirable features will be obvious and separately accomplished by referral to the accompanying description and drawings wherein:

Fig. 1 is a top plan view of the capseal.

Fig. 2 is a side elevation view of the capseal shown in Fig. 1.

Fig. 3 is an elevation view of a capseal section taken along line 3—3.

Fig. 4 is an elevation view of a section showing the capseal secured in place within the confines of a typically adaptable closure opening.

Fig. 5 is a perspective view of the capseal inverted without a gasket attached thereto.

Referring now to the figures it will be seen that the capseal consists of a substantially flat planal bottom portion 10 surrounded by and integral with cylindrical wall portions 11 and 12 which extend substantially upward from the bottom portion 10. Extending laterally out from the wall portions 11 and 12 are tearing ears 13 and 14 which project from the bottom portion 10 through the gaps resulting from the lack of continuity of the capseal wall portion.

The tearing ears 13 and 14 are preferably diametrically opposed. Their lateral straight sides join the bottom portion preferably perpendicular to the outer cylindrical surfaces of the wall portions 11 and 12, as well as at the points where the sides of these latter portions terminate, to form a slot or gap in the capseal's cylindrical wall. Ex-

tending across these points of joinder of the tearing ears 13 and 14 with the capseal's body portion are scored lines of weakness 15 and 16 induced in either the upper or lower face of the bottom portion 10. The lines of weakness 15 and 16 are induced in either the upper or lower face of the bottom portion 10. The lines of weakness are preferably induced by reducing the thickness of the bottom portion along the scored lines 15 and 16.

Thus it will be seen that the tearing ears 13 and 14 together with the area of the bottom portion 10 within the limits of the scored lines 15 and 16 describe what is preferably desired in the invention, viz., a continuous diametric tearing strip 17 integral with the body portion of the capseal.

As the uses of the capseal dictate, as will be elaborated upon hereinafter, the capseal may or may not be provided with a capseal gasket 18. Where used, the gasket is gummed or lacquered to the under face of the capseal's bottom portion 10. Depending primarily upon the gasket seat provided in the closure opening, the gasket will occupy a position on the capseal substantially approaching in diameter that of the capseal's body portion.

The capseal is secured within the confines of a closure opening whose structural characteristics are best typified by referring to Fig. 4.

The throat area generally shown as 19 has a cylindrical neck portion 20 from which extends an annularly recessed curled free-end portion 21 and a substantially flat seat portion 22 perpendicular to the axis of the throat 19 and below the free-end portion 21. The diameter of the curled portion 21 is substantially greater than that of the throat 19 allowing a substantial area whereon the gasket 18 may be compressed. The diameter of the wall portions 11 and 12 approach that of the clear diametric distance between the inner edges of the curled free end portion 21 of the closure.

To allow the tearing ears 13 and 14 to pass freely through the confines of the closure's free end portion 19, the latter is slotted as at 23 and 24 providing a gap. The lower faces 25 and 26 of the gap are preferably located above the seat portion 22. The gaps thus described by the slotted sides of the curled free end portion 21 and the lower faces 25 and 26 have a width comparable to that of the tearing ears 13 and 14, such that the gap faces as at 23 and 24 line up substantially with the sides of the capseal's wall portion across the closure opening. Thus it will be seen that the gaps of the capseal's side wall portions and the gaps of the closure's free end portion are comparably dimensioned and adjacently located.

The capseal material may consist of light gauge metal or terne or a combination of laminated surfaces which combine to provide a capseal material that is both rigid and frangible.

The capseal is affixed to the closure opening by the operable portions of a sealing tool which coact to apply outward and downward pressure to the wall portions 11 and 12, and the bottom portion 10 of the capseal, respectively. As the sealing operation progresses it will be seen that a substantial amount of the outward displacement of the wall portions 11 and 12 by reason of the outward operating pressure, results in a cam action wherein wall portions of the capseal follow the path described by the inner surface of the annular recessed curled free end portion 21.

Thus there is a resulting downward displacement of the capseal body thereby compressing the gasket 18 against the seat of the closure 22. This sealing action is terminated by a compressing of the capseal's wall portions 11 and 12, against the inner surface of the annulus of the curled free end portion 21. Thus the gasket 18 is held fixedly in compressed position against the closure seat 22 and the wall portions 11 and 12 are contiguously affixed within the closure opening with a high degree of permanence resulting from the bowed rigidity of the capseal material.

It will be noted that the wall portions 11 and 12 occupy less than one half each of the perimetric distance of the capseal. It requires a smaller amount of operating force to mutate such an apportionment of the capseal area than if the capseal wall portion were continuous. Thus by using a sufficiently rigid capseal material the capseal will possess qualities of permanence and yet be readily secured in place with low operational force. To remove the capseal and virtually destroy the same, one of the tearing ears may be gripped and pulled upward. Since the wall portions of the capseal are fixedly secured within the confines of the closure opening, the capseal material must cleave or shear along the scored lines of weakness 15 and 16, to form the tearing strip 17. The tearing action may be continued across the capseal halving it. The halved portions then fall freely away from their retained position within the confines of the closure.

It will be seen that tearing action is localized since the shearing or cleaving action in removing the capseal is restricted to the tearing strip. By scoring the capseal along certain lines of weakness the tearing force is further localized to that weakened area. Finally, by locating the termini of the scored lines adjacent to the points where the sides of the capseal wall, rigidly retained within the closure opening's free end portion, meet the points of joinder with the tearing ears, cleavage along the scored lines is further assured. Thus, there is a high degree of stress concentration at weakened areas which results in a readily removable capseal.

A gasket 18 is used where the capseal serves to either directly or indirectly seal the contents of the container from leakage as well as unauthorized access. However, some users of the capseal may choose to use the capseal without a gasket, as shown in Fig. 5, thus employing the capseal only to prevent undetected tampering with the container's contents. It will be seen that the wall portions 11 and 12 of the capseal, by reason of their contiguous relationship with the inner surface of the free end portion 21 of the closure opening, as well as the rigidity of the capseal material, are completely free from undetected tampering. Attempts at prying beneath the free edges of the capseal's wall portion 11 and 12, or of piercing the bottom portion 10, or of cleaving the tearing strip by use of the tearing ears 13 and 14 offer unmistakable evidences of tampering.

Thus I have accomplished the objects of my invention. It is to be understood that the features of capseal design elaborated herein may be separately accomplished in other capseals for sealing a variety of closure openings and therefore I do not wish to be limited in the scope of my invention to the particular modification set forth.

Having described my invention, what I claim is:

1. In a capseal and closure opening in combi-

nation, the capseal comprising a substantially flat bottom portion and a wall portion extending upward from the periphery of the bottom portion a substantial distance and connecting therewith, a tearing strip formed in the bottom portion by lines of weakness induced therein, the lines terminating on at least one peripheral edge of the bottom portion, the continuity of the wall portion in at least one area interrupted by at least one tearing ear extending outward from the tearing strip, the closure opening comprising a neck, a seat portion connecting with the neck and directed outwardly therefrom, the periphery of the capseal's bottom portion received on the seat portion, a free end extending upward from and connecting with the seat portion at the outer region thereof, and curling inwardly upon itself, the free end interrupted at points opposed to the capseal's tearing ear and defining a gap in the free end complementary to the tearing ear, the capseal's wall portion residing substantially within and along the curl of the free end, the capseal's lines of weakness terminating substantially at the interrupted sides of the free end portion.

2. In a capseal and closure opening in combination, the capseal comprising a substantially flat bottom portion and a wall portion extending upward from the periphery of the bottom portion a substantial distance and connecting therewith, a tearing strip formed in the bottom portion by lines of weakness induced therein, the lines terminating on at least one peripheral edge of the bottom portion, the continuity of the wall portion in at least one area interrupted by at least one tearing ear extending outward from the tearing strip, the closure opening receiving the capseal in sealing relation through a gasket seated around the under side of the bottom portion, the closure opening comprising a neck, a seat portion connecting with the neck, directed outwardly therefrom, and receiving the gasket, a free end extending upwardly from and connecting with the seat portion at the outer region thereof and curling inwardly upon itself, the free end interrupted at points opposed to the capseal's tearing ear and defining a gap in the free end complementary to the tearing ear, the capseal's wall portion residing substantially within and along the curl of the free end, the capseal's lines of weakness terminating substantially at the interrupted sides of the free end portion.

3. In a capseal and closure opening the combination of a capseal comprising a flat bottom portion and a substantially arcuate wall portion, the wall portion connecting with and extending upward from the bottom portion a substantial distance, a tearing strip formed in the bottom portion by lines of weakness induced in the bottom portion, the lines terminating at the periphery of the bottom portion, the continuity of the wall portion interrupted by at least one tearing ear extending outward from the bottom portion at a terminal of the tearing strip, the closure opening comprising a neck, a seat portion connecting with the neck, directed outwardly therefrom, the periphery of the capseal's bottom portion received on the seat portion, a free end extending upwardly from and connecting with the seat portion at the outer regions thereof, the free end being in gripping relation with respect to the capseal's wall, the free end interrupted at points opposed to the capseal's tearing ear and defining a gap in the free end complementary to the tearing ear, portions of the capseal's wall

portion residing substantially within the free end, the capseal's lines of weakness terminating substantially at the interrupted sides of the free end portion.

4. In a capseal and closure opening, the combination of a capseal comprising a flat bottom portion and a substantially cylindrical wall portion, the wall portion integral with and extending upward from the bottom portion at its periphery a substantial distance, a tearing strip formed in the bottom portion by lines of weakness induced therein, the lines terminating on at least one peripheral edge of the bottom portion and in the plane thereof, the continuity of the wall portion in at least one area interrupted by at least one tearing ear extending outward from the terminal of the tearing strip, the closure opening receiving the capseal in sealing relation through a gasket seated around the under side of the bottom portion, the closure opening comprising a neck, a seat portion connecting with the neck, directed outwardly therefrom, and receiving the gasket, an annular free end extending upwardly from and connecting with the seat portion at the outer region thereof, the free end interrupted at points opposed to the capseal's tearing ear and defining a corresponding gap for the tearing ear, the gap being complementary with the lateral sides of the tearing ear, the capseal's wall portion residing in gripped position substantially within and around the free end, the capseal's lines of weakness terminating substantially at the interrupted sides of the free end portion.

5. A capseal adapted to seal a closure of a vessel comprising a flat bottom portion having at least one tearing ear at the peripheral edge of said bottom portion, and a pair of scored lines terminating on said edge at the points of joinder of said edge with the edges of said tearing ear, a wall portion extending upwardly from said bottom portion commencing at said points of joinder, a gasket fixedly attached to the under face of said bottom portion and extending therearound, whereby said ear forms an immediately adjacent continuation of said bottom portion and a gap is defined in said wall portion where-through said ear may pass, thereby permitting a mouth of said vessel to receive said wall portion therewithin in gripping relation and permitting said tearing ear to pass from within said vessel through the wall thereof.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
625,055	Painter	May 16, 1899
1,058,640	Stenius	Apr. 8, 1913
1,359,731	Nowack	Nov. 23, 1920
1,805,003	Newman	May 12, 1931
1,845,078	Draper et al.	Feb. 16, 1932
1,982,145	Shera	Nov. 27, 1934
2,056,043	Fausek et al.	Sept. 29, 1936
2,147,325	Wackman	Feb. 14, 1939
2,214,399	Benson	Sept. 10, 1940
2,299,281	Sample	Oct. 20, 1942

FOREIGN PATENTS

Number	Country	Date
162,316	Switzerland	Aug. 16, 1933