

No. 772,708.

PATENTED OCT. 18, 1904.

M. ELFSTRAND.
BOTTLE CLOSURE.

APPLICATION FILED JAN. 30, 1904.

NO MODEL.

Fig. 1.

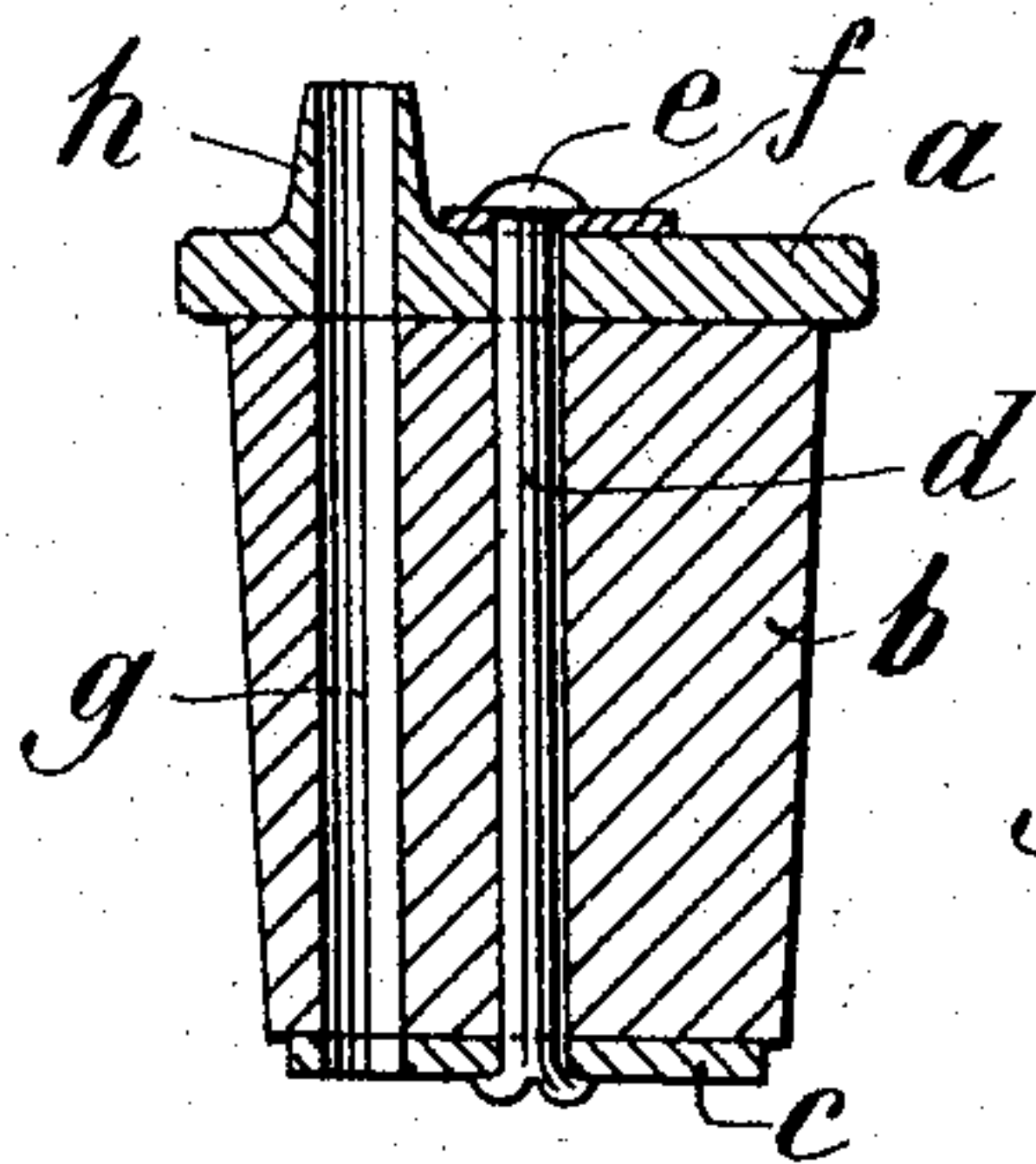


Fig. 2.

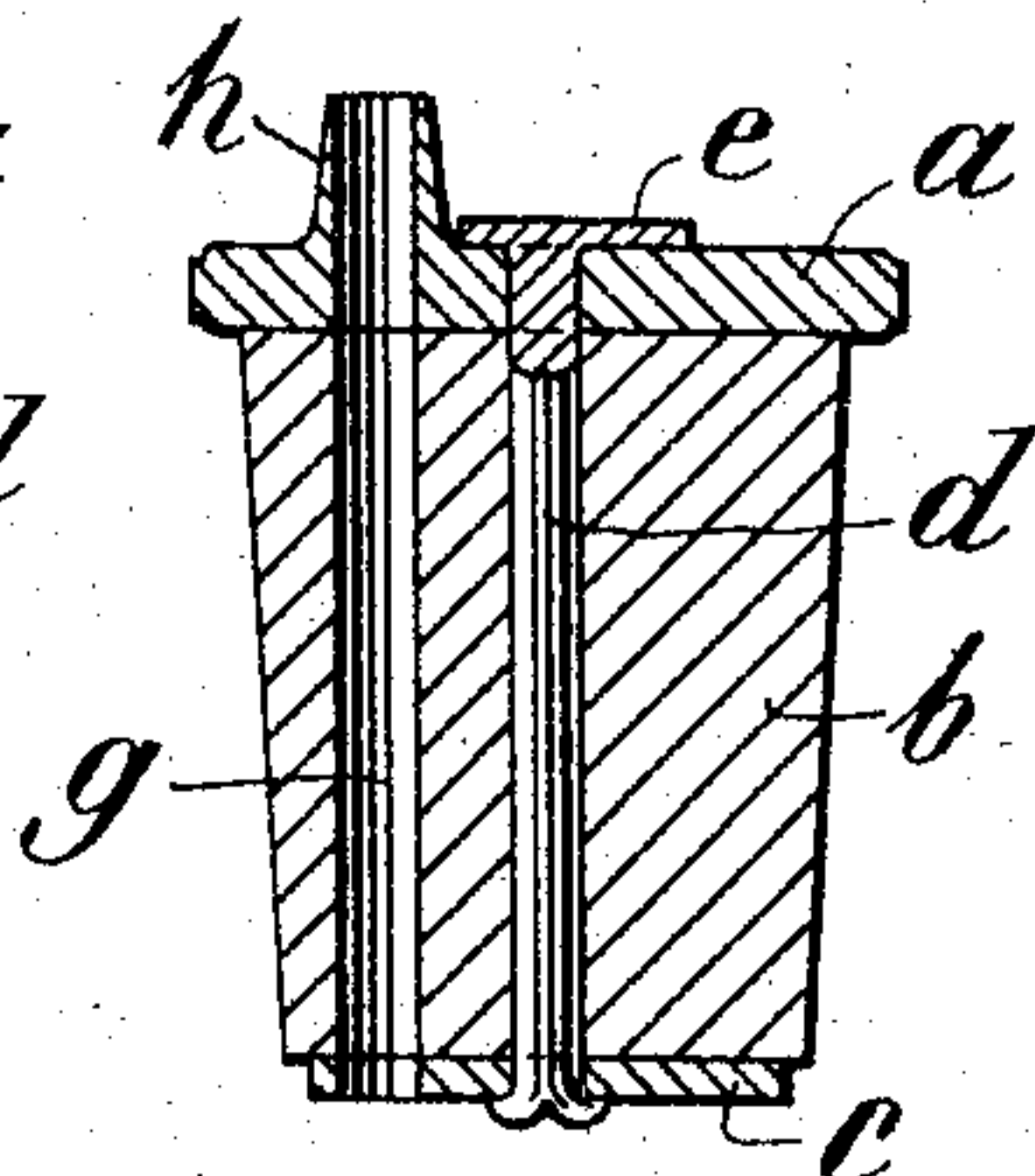


Fig. 3.

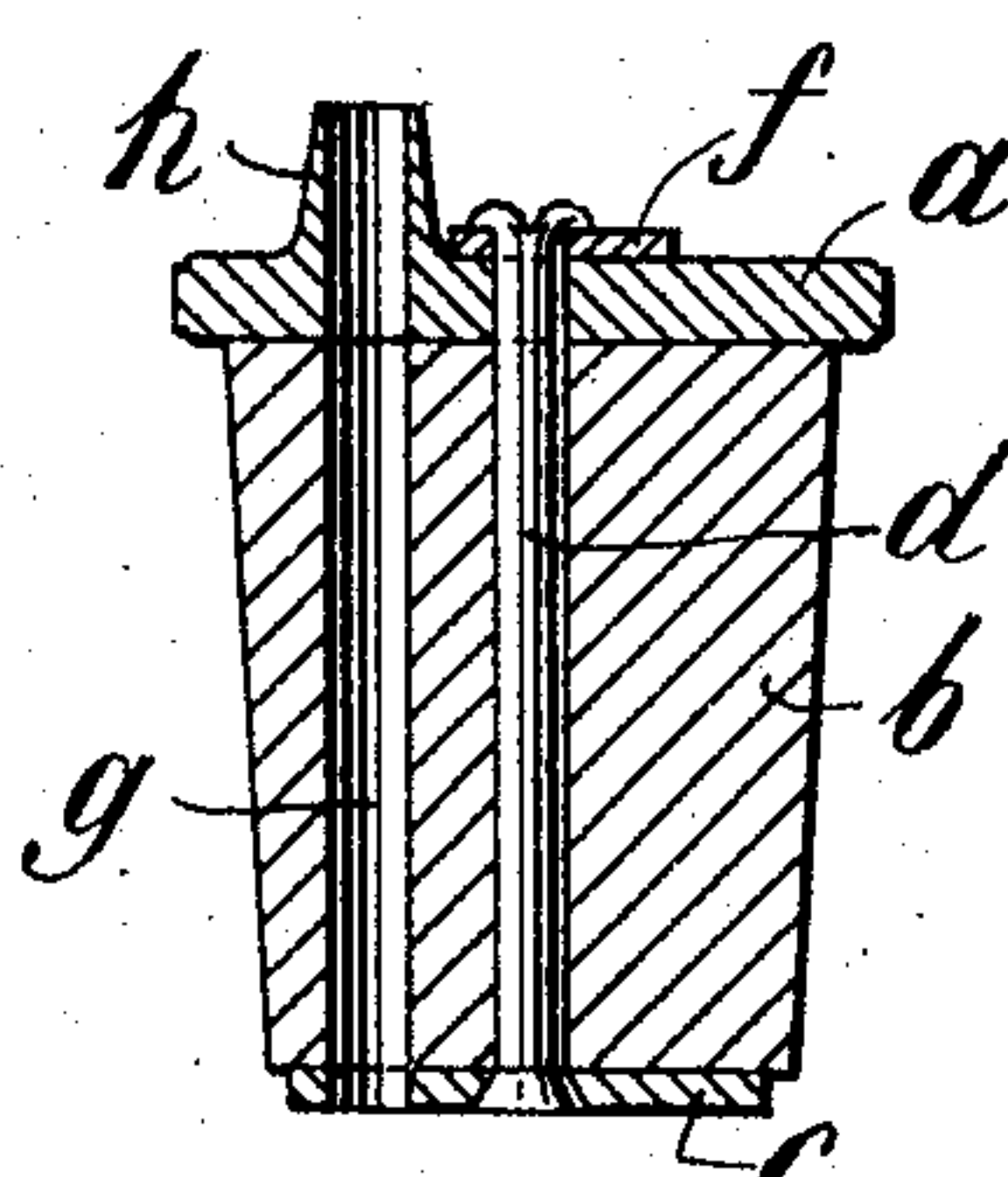


Fig. 4.

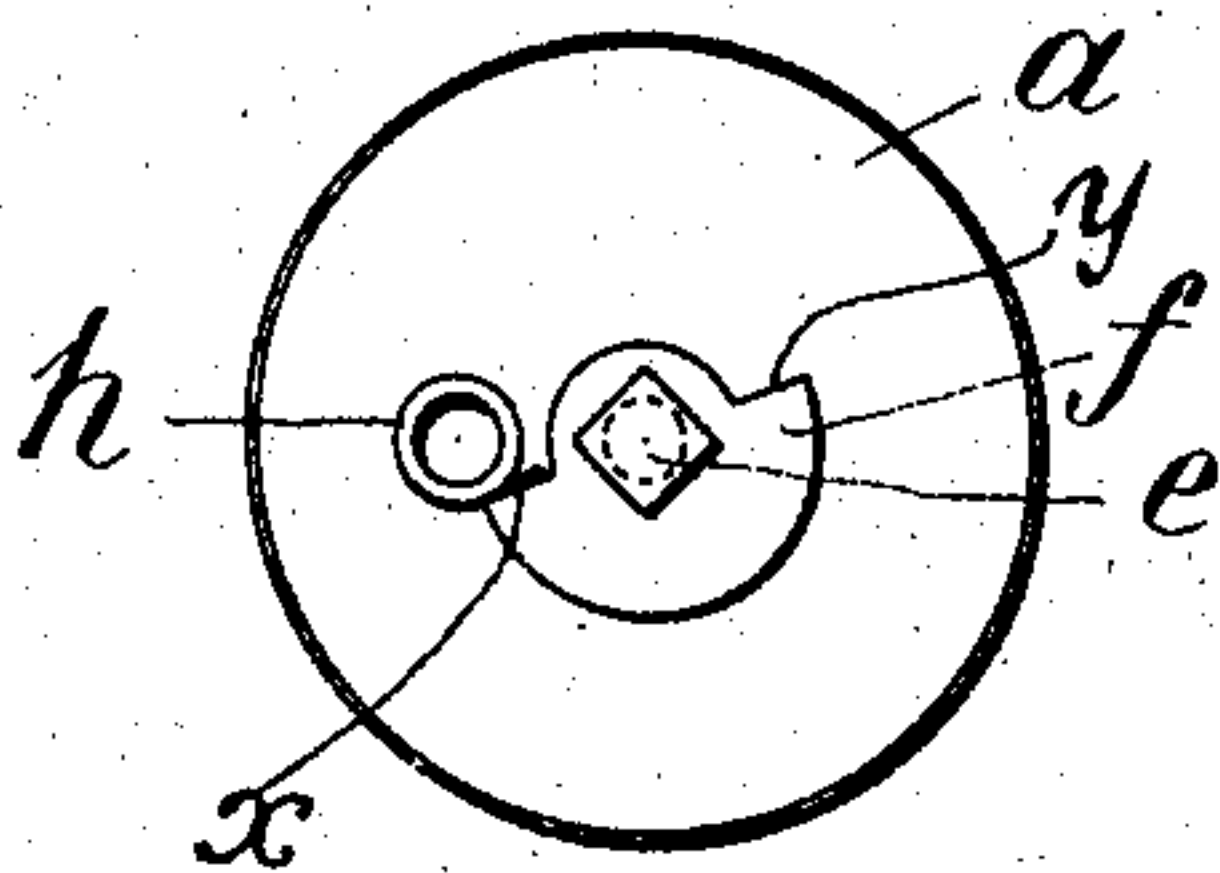
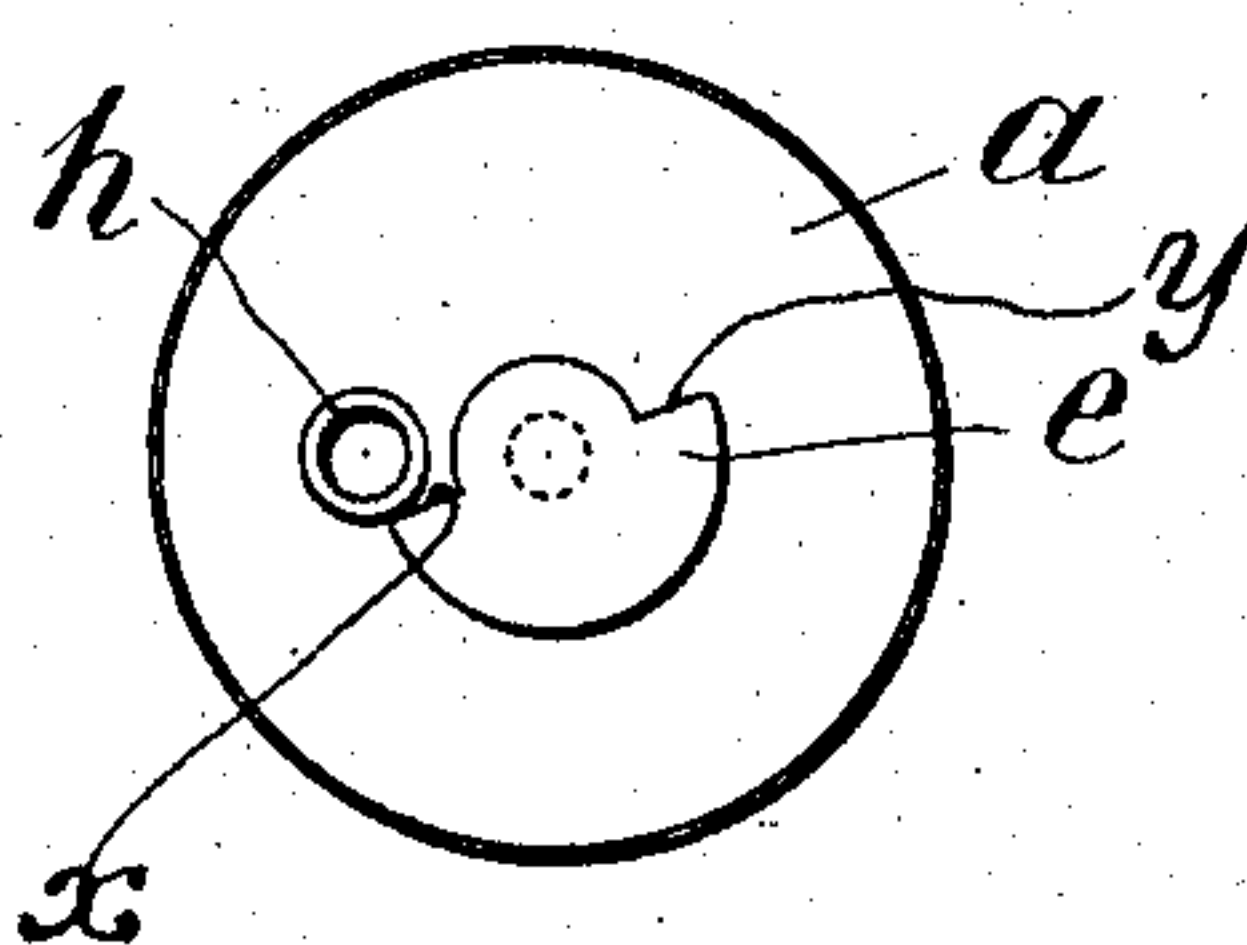


Fig. 5.



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BOTTLE-CLOSURE.

SPECIFICATION forming part of Letters Patent No. 772,708, dated October 18, 1904.

Application filed January 30, 1904. Serial No. 191,344. (No model.)

To all whom it may concern:

Be it known that I, MÅRTEN ELFSTRAND, a subject of the King of Sweden and Norway, and a resident of Upsala, Sweden, have invented new and useful Improvements in Bottle-Closures, of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof.

This invention relates to improvements in bottle-closures having rotatable closing-disks.

The bottle-closure which is most like the subject-matter of the present invention is that shown in the British Patent No. 25,187, dated November 24, 1902, (and German Patent No. 139,970, dated January 20, 1903, and shown and described in the French Patent No. 322,540, dated October 8, 1902,) in which bottle-closure the closing-disk is secured to the upper end of the stopper by means of a screw inserted through the said stopper. The said screw, however, easily cuts into the stopper, thereby causing the breaking of the latter, so that the screw will no longer have sufficient hold. Besides, the nut in the repeated rotation of the closing-disk will unscrew, and an ignorant person may unintentionally unscrew the nut, not understanding that the nut must be screwed tight in order to fully close the bottle-closure. It is therefore desirable to obtain a more suitable and less expensive bottle-stopper. This will be accomplished by the present invention.

The invention consists, principally, in that the axle of the closing-disk, which is at the one end provided with a suitable head or the like after the closing-disk has been placed in position on the one end of the stopper proper and another disk or body of suitable shape has been placed onto the other end of the said stopper, is inserted through the center of the closing-disk and the stopper, whereupon the latter is compressed in longitudinal direction, and the other end of the shaft of the closing-disk is riveted in any suitable manner, expanded or slit, and the branches bent apart in such a way that the stopper will be permanently held in compressed condition. The invention also consists in the combination, with

the bottle-stopper, of a checking device more specially described hereinafter.

In order to make the nature of my invention more easily understood, I have shown in the accompanying drawings some ways of carrying out the same.

Figures 1 to 3 show each a constructional form of the invention in vertical section. Fig. 4 shows a top view of the device shown in Fig. 1 or Fig. 3, and Fig. 5 shows a top view of the device illustrated in Fig. 2.

The device consists of a stopper-body *b*, made of any elastic material—for instance, cork—which body has a channel *g* for letting out the contents of the bottle. On the lower end of the stopper is placed a disk *c*, having a hole or opening corresponding to the said channel *g*, the said disk being as large as possible without of course extending beyond the circumference of the stopper. On the upper end of the stopper-body is placed a closing-disk *a*, which is fixed to the said body by means of a pin *d* and rotatable on the latter, the said disk *a* being provided with an opening or a pipe *h*, communicating in a certain position of the closing-disk with the channel *g*. The said pin *d* is inserted through a central opening in the closing-disk, through the stopper-body *b* in the longitudinal direction of the latter, and through the said disk or plate *c*, the upper end of the said pin being formed with a head *e*. Between the latter and the closing-disk *a* is provided an intermediate plate or disk *f*, by means of which is obtained a larger pressure-surface against the closing-disk than by a small pin-head, and which may also serve as a checking device, as will be hereinafter explained. The lower end of the pin below the disk *c* is enlarged, expanded, or riveted.

If desired, the intermediate plate *f* may be dispensed with, in which case the pin-head may be made of larger dimensions than otherwise and of such shape that it can serve as checking-plate, Figs. 2 and 5. Finally, the pin may, as will be easily understood, be inserted in the stopper-body from the lower end of the same and be riveted or expanded at the upper end, Fig. 3.

Under all circumstances the closing-disk and the disk *c* must be connected to each other by means of the pin in such manner that the stopper-body is strongly compressed
5 between the same.

Instead of one outlet-channel the stopper-body may be provided with two or more such channels, in which case the closing-disk may be provided with a corresponding number of
10 outlet tubes or holes, which in certain cases may be suitable for use when, for instance, a powder is to be spread out or sprinkled uniformly over a surface.

When the bottle-closure is to be used for
15 sprinkling purposes, the closing-disk may be provided with a projecting outlet-tube and not only an outlet-opening, inasmuch as in the former case almost nothing of the contents of the bottle will be wasted in using the
20 latter. The use of such a tube will prevent the overflow and running down of the contents onto the outside of the stopper which would otherwise occur, causing waste.

The strong compression of the stopper gives
25 the following results:

First. On account of the permanent tendency of the stopper-body to expand longitudinally the bottle-closure will always be held perfectly tight even if the parts which are
30 rotatable against each other have become worn on account of frequent use.

Second. The bottle-closure will remain perfectly tight even if the same has been frequently taken out from and again inserted
35 into the bottle. If the bottle-closure, which fits well in the neck of the bottle, is drawn out by means of a force acting upon the closing-disk, the pressure will work on the lower end of the stopper-body and compress or tend
40 to compress the latter in axial direction, so as to move (in the former case) the closing-disk away from the stopper-body. If the latter be made of a material such, for instance, as
45 cork, which is partially but not fully elastic, the closing-disk would not but for the said compression retake its original position close to the stopper, but would become leaky, as would also be the case when pressing the
50 bottle-closure down into the bottle. If, however, the stopper-body is strongly compressed between the disks *a* and *c*, according to this invention, this will not occur, but the stopper will remain tight even after repeated removals
55 from and insertions into the bottle. To what degree the stopper for this purpose need be compressed cannot be prescribed for each case, the degree of compression depending not only on the elasticity of the stopper, but also upon
60 how strongly the same is pressed into the bottle. For common cork, the cheapest and most often used material, a compression of about one-fourth or one-third of the original length of the stopper is in the most cases sufficient. If a screw be used for attaching the closing-

disk to the stopper-body, as shown in the
65 earlier patents before referred to, the stopper may in the above-mentioned cases possibly be made tight by screwing the nut tight. It is, however, not certain that the person who uses the bottle-closure understands this, and in all
70 circumstances it is better that he should not need to do so. Besides, the screw device illustrated in the said patents has the disadvantage that the person who uses the bottle-stopper may with or without intention unscrew the
75 nut, and if this does not occur the screw will on account of the repeated rotation of the closing-disk sooner or later unscrew. In all these cases the bottle-closure will obviously
80 become untight. It is certainly true that the nut may be prevented by any suitable device from unscrewing; but this requires, of course, a special device, which at least in a certain degree would complicate the bottle-closure and make the same more expensive. Besides, a
85 nut and screw are in themselves too expensive parts in such a small article of manufacture and makes the manufacture of the closure more expensive, inasmuch as the fitting or screwing together takes a considerable time.
90 The simplest, cheapest, and at the same time the most reliable manner for obviating the said disadvantages is to use the above-described device. By means of a simple apparatus the stopper-body may when the parts
95 are being put together be quickly compressed and then immediately the pin be quickly expanded or riveted. The stopper-body will thereby be transformed to a spring which in all cases has a sufficient strain to keep the
100 closure fully tight, and the latter cannot be made loose in common use. The use of a largest possible disk on the lower end of the stopper-body instead of the screw end shown
105 in the above-mentioned patents, which screw end may easily cut into the stopper-body, has also the advantage that the peripheral parts of the stopper are pressed in the same degree as the central parts of the same against the
110 closing-disk, whereby a reliable tightening is obtained also between the peripheral parts of the stopper-body and the closing-disk even if the stopper-body is comparatively short.

Third. A third advantage which will be obtained by the strong compression of the elastic stopper is that the said compression renders possible the use of a stop device which is
115 suitable, reliable, and necessary for such bottle-stoppers. For this purpose it is only necessary that the intermediate disk *f*, Fig. 1, or, if
120 such be not used, the pin-head *e*, Fig. 2, should have suitable shape and that the closing-disk should be provided with an outlet-pipe *h* or any other projecting body, as more particularly described below. If the pin *d* be in any convenient
125 manner non-rotatably connected to the disk *c* and the intermediate plate *f*, Fig. 1, and the latter has, for instance, the shape shown in

Fig. 4, and if, further, the outlet-pipe *h* has such a position that when the closing-disk is rotated in the one direction it will strike the intermediate disk at *x* and when the closing-disk is rotated in the other direction will strike the said disk at *y*, it is not possible to further rotate the closing-disk unless unnecessary power is used, and if the intermediate disk be so arranged that the striking of the same at *x* will occur just as the outlet-pipe has come in full communication with the outlet-channel *g*, Figs. 1 to 5, one may easily, quickly, and conveniently rotate the closing-disk into open position without spending any time or trouble to examine whether this has occurred or not. For closing the bottle the closing-disk is of course rotated in the opposite direction until the outlet-pipe strikes the intermediate plate (checking-plate) *f* at *y*. The latter may, preferably, be of such shape that it allows the closing-disk to be rotated through ninety degrees. The stopper being strongly compressed between the disks, such a great friction is maintained between the said bodies that the disk *c*, and thus the intermediate disk *f*, which is non-rotatable in relation to the disk *c*, cannot be rotated too far unless unnecessary power is used. Especially is this the case if the upper side of the plate *c* is not smooth and even. It is obvious that the resistance against further rotation of the closing-disk offered by the said intermediate disk *f* will be the greater the more strongly that the stopper is compressed and the larger the friction-surfaces between the disk *c* and the stopper are.

When the stopper has been inserted, for instance, in a bottle, it is possible, in spite of the axial strain of the stopper-body, to rotate the closing-disk between *x* and *y* without *f* and *c* partaking in such rotation, inasmuch as the friction between the soft elastic stopper-body and the disk *c* is much greater than that between the hard comparatively small intermediate plate *f* and the hard closing-disk.

Having now particularly described my invention and in what manner the same may be performed, what I claim as new, and desire to secure by United States Letters Patent, is—

1. A closure for bottles and the like consisting of, a stopper of elastic material having a channel therein, a pin extending through the said stopper in the longitudinal direction of the same, a plate secured to the lower end of the said pin, a closing-disk on the upper end of the said stopper, the said closing-disk being rotatably journaled on the upper end of the said pin, and a head at the upper end of the

latter, the said pin being of such length as to hold the stopper strongly compressed between the said plate and closing-disk, substantially as and for the purpose set forth.

2. A closure for bottles and the like consisting of, a stopper of elastic material having a channel therein, a pin extending through the said stopper in the longitudinal direction of the same, a plate secured to the lower end of the said pin, a closing-disk on the upper end of the said stopper, the said closing-disk being rotatably journaled on the upper end of the said pin, an outlet-pipe on the said closing-disk, and a head at the upper end of the said pin, the pin being of such length as to hold the stopper strongly compressed between the said plate and closing-disk, substantially as and for the purpose set forth.

3. A closure for bottles and the like consisting of, a stopper of elastic material having a channel therein, a pin extending through the said stopper in the longitudinal direction of the same, a plate secured to the lower end of the said pin, a closing-disk on the upper end of the said stopper the said closing-disk being rotatably journaled on the said pin, a projecting body on the said closing-disk, and a head at the upper end of the said pin, the said head having a recess adapted to engage with the said projecting body, the said pin being of such length as to hold the stopper strongly compressed between the said plate and closing-disk, substantially as and for the purpose set forth.

4. A closure for bottles and the like consisting of, a stopper of elastic material having a channel therein, a pin extending through the said stopper in the longitudinal direction of the same, a plate secured to the lower end of the said pin, a closing-disk on the upper end of the said stopper, the said closing-disk being rotatably journaled on the said pin, another plate on the upper side of the said closing-disk having a recess, a projecting body on the said closing-disk adapted to engage the said recess, and a head at the upper end of the said pin, the latter being of such length as to hold the stopper strongly compressed between the first-mentioned plate and the said closing-disk, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MÅRTEN ELFSTRAND.

Witnesses:

GERDA LINDKVIST,
JOHN DELMAR.