I. KNASTER.

CLOSURE FOR COLLAPSIBLE TUBES AND OTHER RECEPTACLES.

APPLICATION FILED FEB. 26, 1919.

1,316,309.

Patented Sept. 16, 1919.

2 SHEETS—SHEET 1.

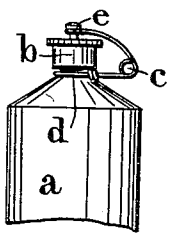


Fig.1.

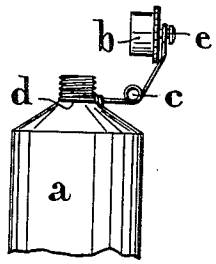


Fig.2.

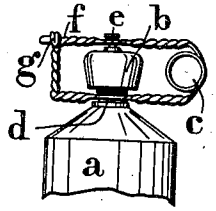


Fig.3.

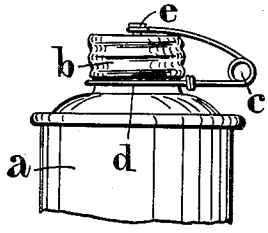


Fig.4.

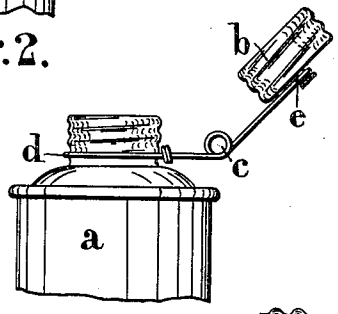


Fig.5.

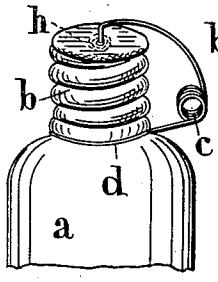


Fig.6.

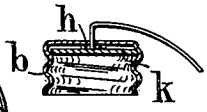


Fig.8.

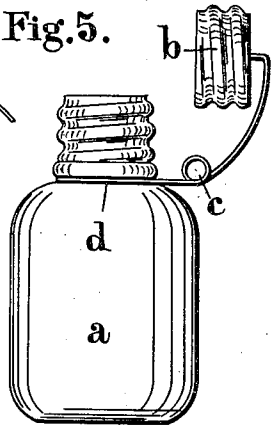


Fig.7.

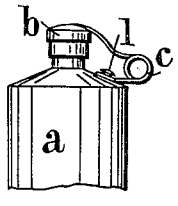


Fig.9.

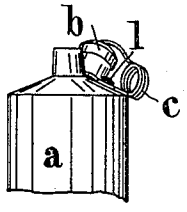


Fig.10.

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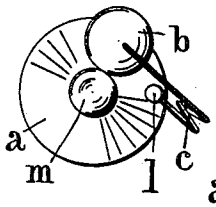


Fig.11.

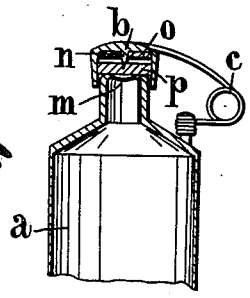


Fig.12.

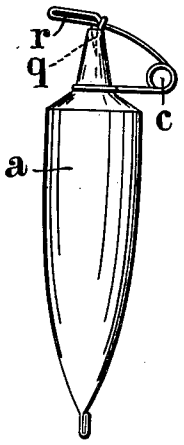


Fig.13.

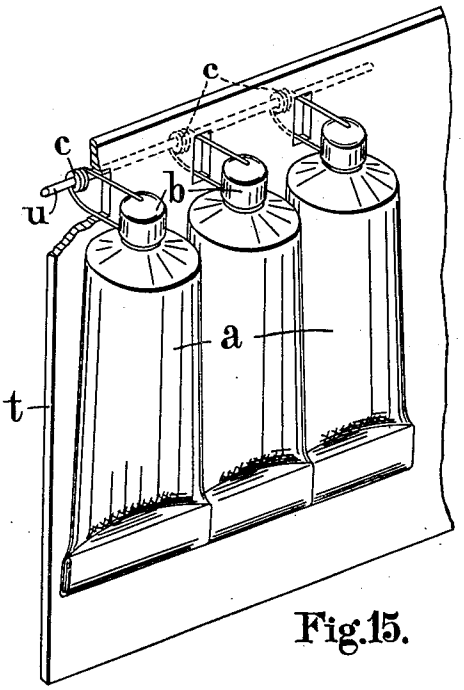


Fig.15.

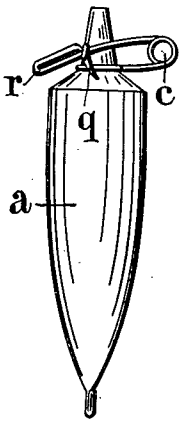


Fig.14.

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UNITED STATES PATENT OFFICE.

IGNATIUS KNASTER, OF CAMBRIDGE, ENGLAND.

CLOSURE FOR COLLAPSIBLE TUBES AND OTHER RECEPTACLES.

1,316,309. Specification of Letters Patent. Patented Sept. 16, 1919.

Application filed February 26, 1919. Serial No. 279,401.

To all whom it may concern:

Be it known that I, IGNATIUS KNASTER, a subject of the King of Great Britain, and resident of 29 Green Street, Cambridge, in the county of Cambridge, England, have invented certain new and useful Improvements Relating to Closures for Collapsible Tubes and other Receptacles, of which the following is a specification.

This invention relates to caps or other closures for collapsible or other tubes, bottles, sprinklers, or other receptacles. One object of the invention is to provide the cap or closure with a spring contrivance by means of which the cap or closure may be permanently secured to the tube, bottle or the like, while at the same time the spring device facilitates the opening of the tube or the like and the obtaining of access to its contents. A further object is to form the said spring contrivance in such a way that the cap or closure when opened, is held well away from the orifice of the tube or the like.

The invention is illustrated, by way of example, in the accompanying drawings, wherein:—

Figure 1 shows a collapsible tube with one form of the closure device in the closed position, and

Fig. 2 shows the same in the open position.

Fig. 3 shows a modified form of closure for a collapsible tube or sprinkler for example.

Fig. 4 shows a form of the device applied to a sheet metal vessel, and

Fig 5 shows the closure device of Fig. 4 in the open position.

Fig. 6 shows a form of the closure device applied to the metal cap of a glass phial, and

Fig. 7 shows the same in the open position, while

Fig. 8 shows the closure of Fig. 6 in section.

Figs. 9 and 10 show in the closed and the opened positions respectively, a form of closure in which a spring holds the cap on the aperture of the vessel.

Fig. 11 shows in plan view, and

Fig. 12 in section a slightly different form of such a closure.

Fig. 13 shows in the closed position, and

Fig. 14 shows in the open position a form of closure in which a spike or pin is normally held in the aperture of the tube or the like for the purpose of preventing coagulation of the contents of the tube in the aperture thereof.

Fig. 15 illustrates the manner in which the closure device can be used for mounting collapsible tubes and so forth on cards or sheets of other material for packing and for display.

In Figs. 1 and 2 the collapsible tube *a* has its screw cap *b* connected to the vessel by a bent wire spring *c*, coiled at its laterally extending middle part, and having its one end twisted and fastened at *d* around the neck of the vessel at the bottom of the screw thread, while the other end is looped at *e* around the central knob of the cap. This allows the cap to be turned in the spring device in screwing it up or unscrewing it. When the cap *b* is unscrewed it springs open to the position of Fig. 2, or to any other desired angular position depending on the strength or number of turns of the spring coil *c*. When the cap is to be closed again the spring coil acts as a hinge facilitating the correct application of the cap to the neck of the vessel.

The form of the device shown in Fig. 3 differs only from that of Fig. 2 in that the cap *b* is not a screw cap, and the nozzle is not threaded, but the cap is locked in the closed position by an extension *f* of the wire beyond the loop *e* engaging with a hook *g* formed by an extension of the wire beyond the part *d* which engages with the neck of the vessel. The cap is released by pressing downwardly and laterally the extension *f* to release it from the hook *g* when the device flies open to a position corresponding with that of Fig. 2.

Figs. 4 and 5 show an equivalent device to that of Figs. 1 and 2 but applied to a sheet metal vessel such as is commonly employed to hold liquid metal polish and so forth, the corresponding parts being lettered to agree with Figs. 1 and 2.

Figs. 6, 7 and 8 show a corresponding device applied to the screwed metal stopper *b* of a glass phial *a* such as is used for holding medicinal tablets. In this case, however, instead of the spring wire being looped around the knob on the closure device, this latter has a central hole in it through which the end of the spring wire is passed as at *h*, Figs. 6 and 8, the end of the wire inside the cap *b* being then coiled to form an enlargement, or being flattened out by pressure or

otherwise so that it will not come out of the hole at *h*. Generally a disk of cork or the like *k* is inserted inside the cap *b* for effecting an air-tight closure, the coiled or flattened end of the spring wire lying between the interior of the cap *b* and the back of the cork disk *k*, as seen in Fig. 8.

Figs. 9 and 10 show the alternative form of the device wherein the spring *c* tends to hold the closure on the aperture *b* of the vessel *a*. In this case one end of the spring is looped around a stud *l* on the shoulder of the vessel *a*, while its other end is soldered or otherwise secured to the cap *b*. In the position of Fig. 9 the spring holds the cap positively against the aperture of the vessel. When the cap is lifted and turned aside as in Fig. 10, the spring holds it against the shoulder of the vessel so that it cannot swing about or interfere with the discharge of the contents of the vessel through the aperture.

Fig. 11 shows in plan view the position which such a closure device generally occupies when lifted and turned aside to expose the aperture, but in addition Figs. 11 and 12 also illustrate the application of the invention to a vessel which is hermetically closed by a thin diaphragm or septum *m*, this latter being pierced when the contents of the vessel are to be discharged. In this example the cap *b* has a central pin or spike *n* which serves the purpose of piercing the diaphragm, and around this pin or spike is a ring *o* of cork, rubber or the like which will close against the top of the vessel surrounding the septum *m* after this latter has been perforated. In order then to prevent the premature perforating of the septum, such a device will normally be sold with a disk such as *p* formed of cardboard or the like which must be poked or shaken out in order to expose the spike *n*, and to allow this to be forced inwardly to perforate the septum *m*. The spike *n* may be of course of any shape so as to cut either a hole say or elongated slot for example in the septum.

Figs. 13 and 14 show the application of the invention to vessels for containing coagulating adhesives, for which the best form of closure is a pin or prong thrust into the nozzle of the vessel. When this is withdrawn, it leaves a clear aperture for the escape of the fluid contents. The pin or prong member *q* in this case is formed on or held by the end of one arm of the coiled spring *c*, which serves to hold the said pin or prong normally in the nozzle of the vessel as in Fig. 13. When some of the contents of the vessel are to be discharged, the projecting finger piece *r* is lifted to remove the prong *q* and this is turned aside so that the spring *c* holds it in the position of Fig. 14 during the discharge of the adhesive or the like from the vessel.

Fig. 15 shows how the collapsible tubes *a* or the like may be mounted on a card or other sheet such as *t* by cutting a slot therein for the spring loop *c* of each closure device to pass trough. This may be convenient both for packing purposes and also for displaying collapsible tubes in a shop window for example. If necessary a rod or wire *u* may be passed through the loops of a row of springs such as *c* for the purpose of securing them in position on a card. The loops of the springs *c* may also serve for attaching labels, price tickets and so forth, to vessels having caps, stoppers or the like applied thereto as hereinbefore described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An improved container comprising a receptacle having a neck with an orifice forming its outlet, a spring member, means for securing it to said receptacle outside the same, said spring member having an arm extending laterally away from said neck and formed into a coil of a plurality of turns from which a second arm extends back toward said neck, a closing device carried by said second arm, the spring member being so arranged that when the closing device is not in the closing position, the spring holds said closing device in a position wherein it is clear of the outlet orifice.

2. An improved container comprising a receptacle having a neck with an orifice forming its outlet, a spring member and means for securing it to said receptacle, said spring member having an arm extending laterally away from said neck and formed into a coil of a plurality of turns from which an arm extends back toward said neck, said coil tending to raise the former of the arms away from the orifice of the receptacle, a cap provided on said arm for closing said orifice, said cap being provided with releasable means for holding it down on the orifice when the receptacle is closed.

3. An improved container comprising a receptacle having a neck with an orifice forming its outlet, a spring member and means for securing it to said receptacle, said spring member having an arm extending laterally away from said neck and formed into a coil of a plurality of turns from which an arm extends back toward said neck, said coil tending to raise the former of the arms away from the orifice of the receptacle, and a screw cap provided on said arm for closing said orifice.

IGNATIUS KNASTER.