R. L. WILLIS.

ATTACHMENT FOR COLLAPSIBLE TUBES.

APPLICATION FILED MAR. 6, 1917.

**1,274,129.**

Patented July 30, 1918.

2 SHEETS—SHEET 1.

*Fig. 1,*

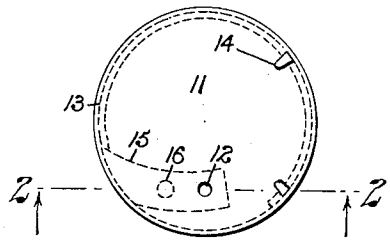



*Fig. 2,*

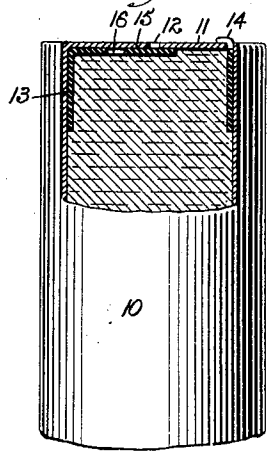



*Fig. 4,*

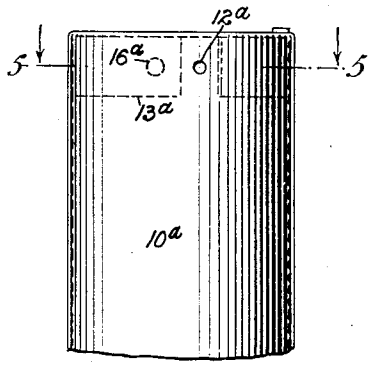



*Fig. 5.*

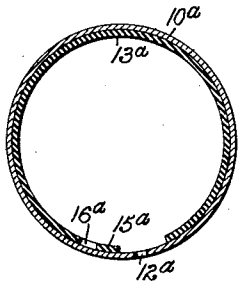
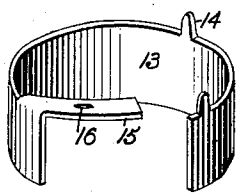



*Fig. 3,*




WITNESSES

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2 SHEETS—SHEET 2.

Fig. 6.

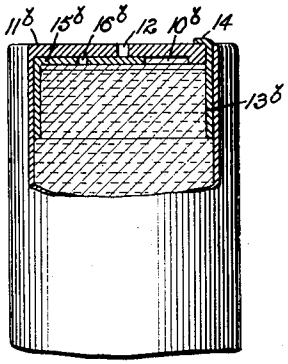



Fig. 7.

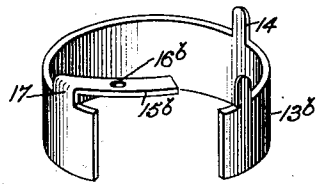



Fig. 8.

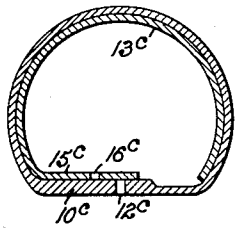



Fig. 9.

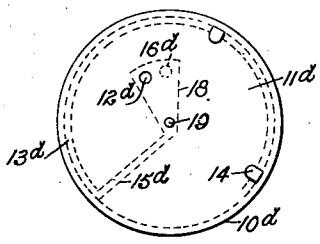



Fig. 10.

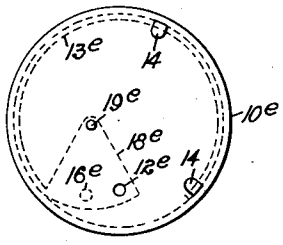



Fig. 11.

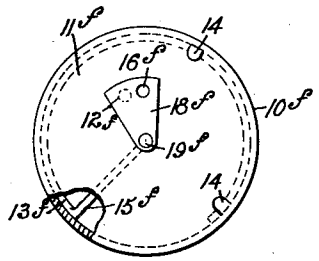
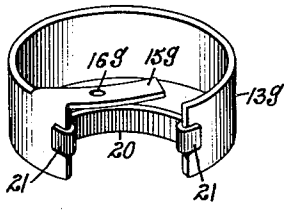



Fig. 12.




WITNESSES

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# UNITED STATES PATENT OFFICE.

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## ATTACHMENT FOR COLLAPSIBLE TUBES.

1,274,129. Specification of Letters Patent. Patented July 30, 1918.

Application filed March 6, 1917. Serial No. 152,806.

*To all whom it may concern:*

Be it known that I, RUSSELL L. WILLIS, a citizen of the United States, and a resident of Manchester, in the county of Hillsborough and State of New Hampshire, have invented a new and Improved Attachment for Collapsible Tubes, of which the following is a full, clear, and exact description.

My invention relates to collapsible tubes which are employed as containers for various substances such as paints, pastes, powders, etc., and the invention more particularly relates to the means for controlling the discharge orifice of the tube whereby to close or open the same as required.

An important object of the invention is to provide a cut-off for the discharge orifice of the tube, of a character to make it possible to do away with the usual screw cap and otherwise to simplify the top or discharge end of the tube.

A further important object of the invention is to provide a cut-off entirely inclosed within the tube but controllable from the exterior thereof.

A further object of the invention is to provide a cut-off in the form of a bowed, resilient element interiorly arranged and which may be compressed or constricted by direct collapsing pressure on the tube adjacent to the discharge orifice to uncover the latter and then permitted to expand to automatically effect a closure of the orifice, and by its expansion to restore the collapsed walls of the tube.

A more specific object of the invention is to provide a resilient cut-off of the character referred to, having means to secure the same to the material of the tube and prevent displacement of said cut-off.

The invention will be particularly explained in the specific description following.

Reference is to be had to the accompanying drawings forming a part of this specification in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a top view of a collapsible tube embodying my invention in one form;

Fig. 2 is a sectional side elevation of the upper portion of said tube, the section being taken on the line 2—2, Fig. 1;

Fig. 3 is a perspective view of the resilient cut-off in the form of the invention illustrated in Figs. 1 and 2;

Fig. 4 is a side elevation illustrating another form of the invention, in which the discharge orifice of the tube is at a side instead of in the top;

Fig. 5 is a transverse section on the line 5—5, Fig. 4;

Fig. 6 is a view similar to Fig. 2, showing a tube equipped with another form of my invention to be referred to hereinafter;

Fig. 7 is a perspective view of the cut-off employed in the construction illustrated in Fig. 6;

Fig. 8 is a view similar to Fig. 5 but showing another modification in which the cut-off arm conforms to a flat side of the tube;

Figs. 9 and 10 are views similar to Fig. 1, showing further variations in the cut-off;

Fig. 11 is a plan view with parts broken away illustrating still another form of the invention.

Fig. 12 is a perspective view of a cut-off in which a separate bowed spring is employed to lend resiliency to the split ring.

The tube 10 made collapsible and in any approved general form may, in carrying out my invention, be provided with a plain, flat top 11. A discharge orifice 12 is suitably formed in a tube in the top 11 or in a side as hereinafter explained, and, if desired, the orifice may, as shown, be formed without any tapered spout and still be effective, though the usual tapered spout may be employed if desired. In the form shown in Figs. 4 and 5, the discharge orifice $12^a$ is formed at a side of the tube. It will therefore be obvious that the orifice may be variously located and differently formed as may be thought desirable.

Within the tube 10 adjacent to the discharge orifice is a flat split ring or bowed resilient element 13 constituting a cut-off for the orifice 12, and which in the illustrated form has bendable tongues 14 which extend through the tube at the top and are bent over the same to positively retain the cut-off in position. In the form shown in Figs. 1 to 3, the cut-off portion of the element 13 is in the form of an arm or flat tongue 15 extending transversely from one terminal of the split ring to lie close to and parallel with the top 11 at the interior. Said portion 15 has an orifice 16 to be brought into and out of register with the orifice 12.

The body of the ring 13 lies close to the inner surface of the side walls of the tube 10 tending to exert its resiliency outwardly. In use when it is desired to permit a por-

tion of the material within the tube to be discharged through the orifice 12, external pressure is exerted on the tube 10 at the sides near the discharge end by pinching the same, thus collapsing the walls of the tube and compressing or constricting the ring 13 to an extent to bring the orifices 16 and 12 into register for the outflow of the material. It will be clear that upon the pinching pressure on the tube 10 being relaxed, the split ring will expand, thus restoring or substantially restoring the collasped walls of the tube and at the same time taking the orifice 16 out of register with the orifice 12, thereby automatically cutting off the discharge and effecting a closure of the outlet.

In the form shown in Figs. 4 and 5, the cut-off $13^a$ is essentially the same as in the first instance, consisting of a split ring within the tube $10^a$, near the lateral discharge orifice $12^a$ so that in the expanded form of said ring the orifice $12^a$ will be between the opposed ends of the ring. The cut-off portion $15^a$ of the ring in the modified form is constituted by a continuation of one end of the ring, and the orifice $16^a$ in said portion $15^a$ is brought into register with the orifice $12^a$ by pinching the tube as previously described.

In the form shown in Figs. 4 and 5, the ends of the ring will meet and limit the collapsing movement, whereas in the form shown in Figs. 1 to 3, the terminal end of the tongue 15 will engage the opposite end of the ring when the orifices are in register.

In the form illustrated in Figs. 6 and 7, the split ring $13^b$ has a cut-off tongue or arm $15^b$ disposed similarly to that illustrated in Figs. 1 and 2, that is to say, parallel with the top $11^b$, but said tongue is connected with the ring by an upstanding web 17 instead of the tongue departing directly from the upper edge of the ring as in Fig. 2. The tongue $15^b$ is received in a recess or slot $10^b$ in the under side of the top $11^b$, said top being thickened to permit of the formation of the recess without unduly weakening the top. With the tongue disposed in the groove $10^b$, the movement of the tongue is confined to a certain path. The orifice 12 and the fastening tongues 14 are the same as in Fig. 1 and the orifice $16^b$ corresponds with the orifice 16.

In the form shown in Fig. 8, the tube has a flattened side $10^c$ and the cut-off tongue $15^c$ of the resilient ring $13^c$ is correspondingly flattened instead of being in a curve continuous with the resilient ring as in Fig. 5, so that said tongue $15^c$ lies flat against the inner surface of the flattened side $10^c$ to bring its outlet orifice $16^c$ to register with the orifice $12^c$ in the tube by a straight movement of the tongue against the inner surface of the flattened side.

In Fig. 9 there is indicated a resilient ring $13^d$ generally in the form of those previously described, said ring having an arm $15^d$ extending inwardly and integral with said arm is a cut-off segment 18 pivoted to the top $11^d$ as by a pivot 19, said sector having a orifice $16^d$ to be brought into and out of register with the outlet $12^d$ of the tube $10^d$ by contraction or expansion of the ring $13^d$.

In Fig. 10 there is indicated a ring $13^e$ directly formed at one end thereof with a segment $18^e$, pivoted as at $19^e$ and formed with an orifice $16^e$ to register with the outlet orifice $12^e$ of the tube $10^e$.

In the form shown in Fig. 11 a cut-off segment $18^f$ is disposed exteriorly on the top $11^f$ of the tube $10^f$. The segment is secured by a pin $19^f$ on or connected with which pin, at the interior of the tube, that is to say, beneath the top $11^f$, is an arm $15^f$ which is integral with or has connection with an end of the ring $13^f$, whereby to turn said arm $15^f$ through an angle for turning the pin $19^f$ and swing the segment $18^f$ to bring the orifices $12^f$ and $16^f$ respectively in the top $11^f$ and the segment into or out of register.

In Fig. 12 instead of relying on the inherent resiliency of the ring $13^g$ to restore the ring after compression thereof, I have shown a bowed spring 20 having hooked ends 21 engaging the opposite edges of the ring. The tongue $15^g$ and orifice $16^g$ may correspond, as shown, with the tongue and orifice in Fig. 3.

I wish to state in conclusion that although the illustrated examples constitute practical embodiments of my invention, I do not limit myself strictly to the mechanical details herein illustrated, since manifestly the same can be considerably varied without departure from the spirit of the invention as defined in the appended claims.

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

1. The combination with a collapsible tube having a discharge orifice, of resilient means within the tube for restoring the same from a collapsed condition, said means pressing outwardly against the interior of the tube and adapted to be optionally compressed by external pressure on the tube to collapse the latter at the said resilient means, said means having a portion thereof positioned relatively to the discharge orifice of the tube to uncover the said orifice by compression of said means, and to close said orifice and simultaneously restore the tube from the collapsed form by the expansion of said resilient means.

2. An attachment for collapsible tubes to control the discharge of material, said attachment consisting of a resilient sheet metal split ring adapted to be inclosed within the

collapsible walls of the tube adjacent to the discharge outlet thereof, whereby to exert outward pressure against said walls, and formed with an orifice for the passage of the contents of the tube, said ring being compressible to vary the position of the orifice therein to permit outflow of the material or to cut off the outflow.

3. An attachment for collapsible tubes to control the discharge of material, said attachment consisting of a resilient sheet metal split ring adapted to be inclosed within the collapsible walls of the tube adjacent to the discharge outlet thereof, whereby to exert outward pressure against said walls, and formd with an orifice for the passage of the contents of the tube, said ring being compressible to vary the position of the orifice therein to permit outflow of the material or to cut off the outflow, together with means to secure said ring to the tube and prevent bodily displacement of the ring.

RUSSELL LEO WILLIS.