

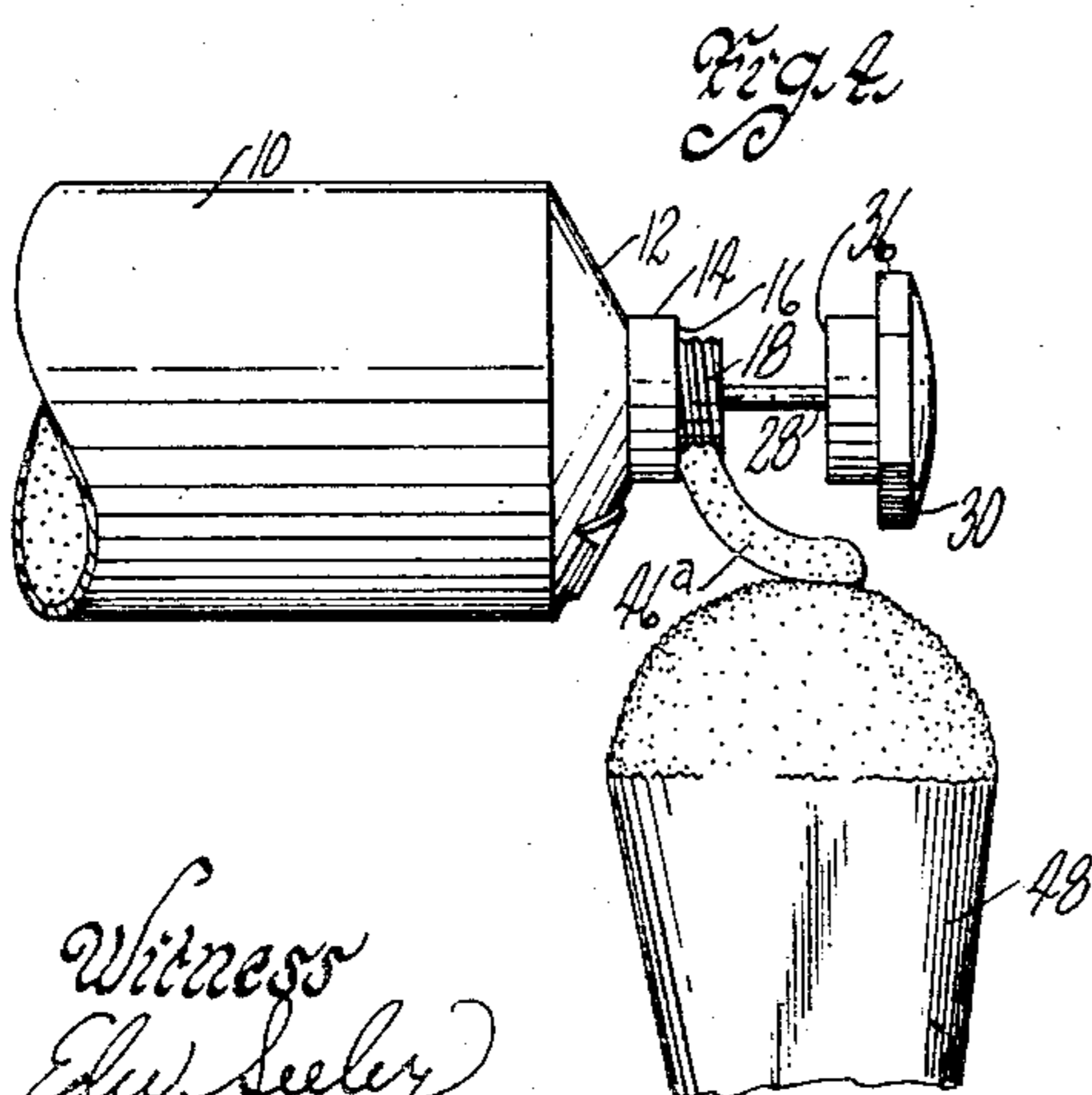
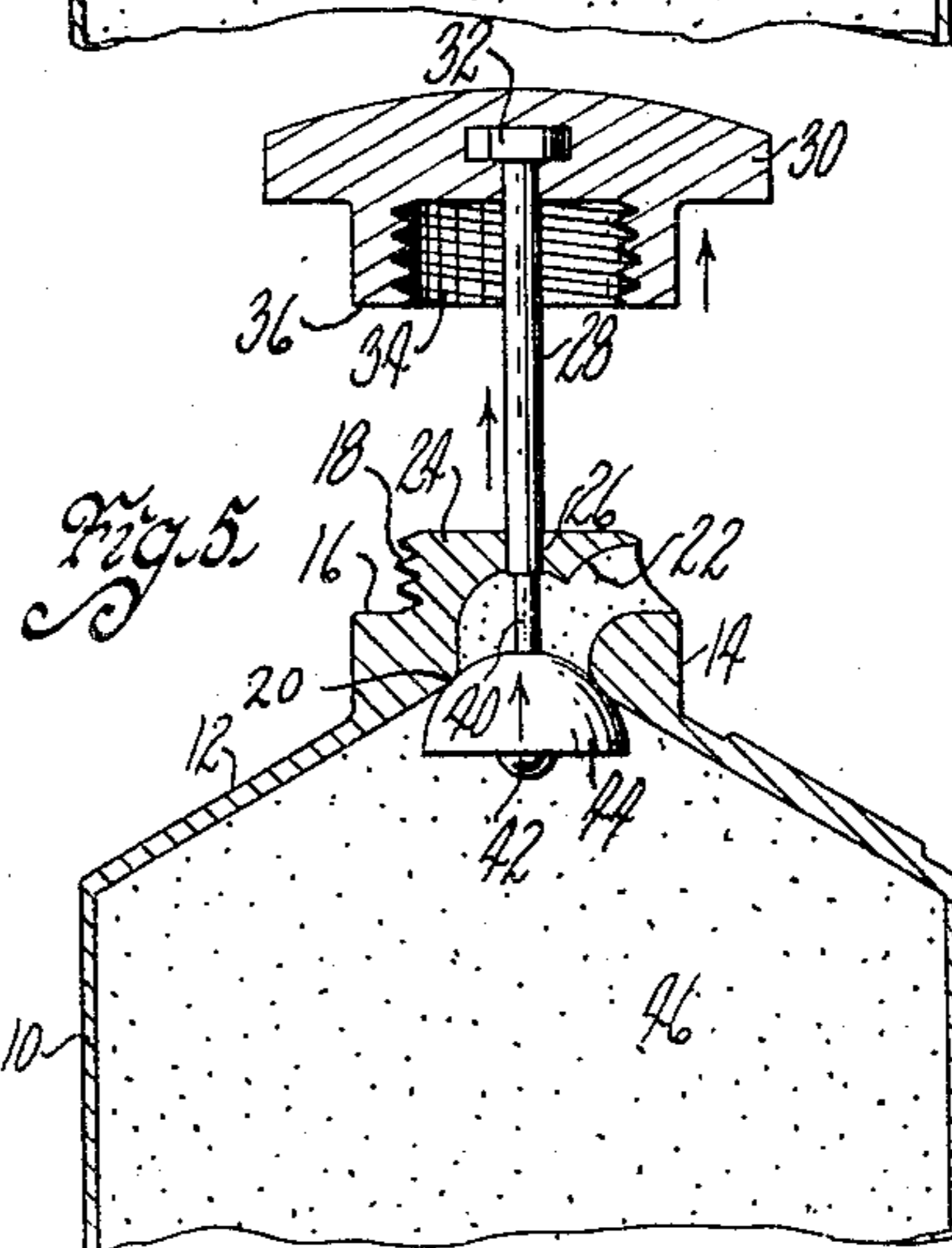
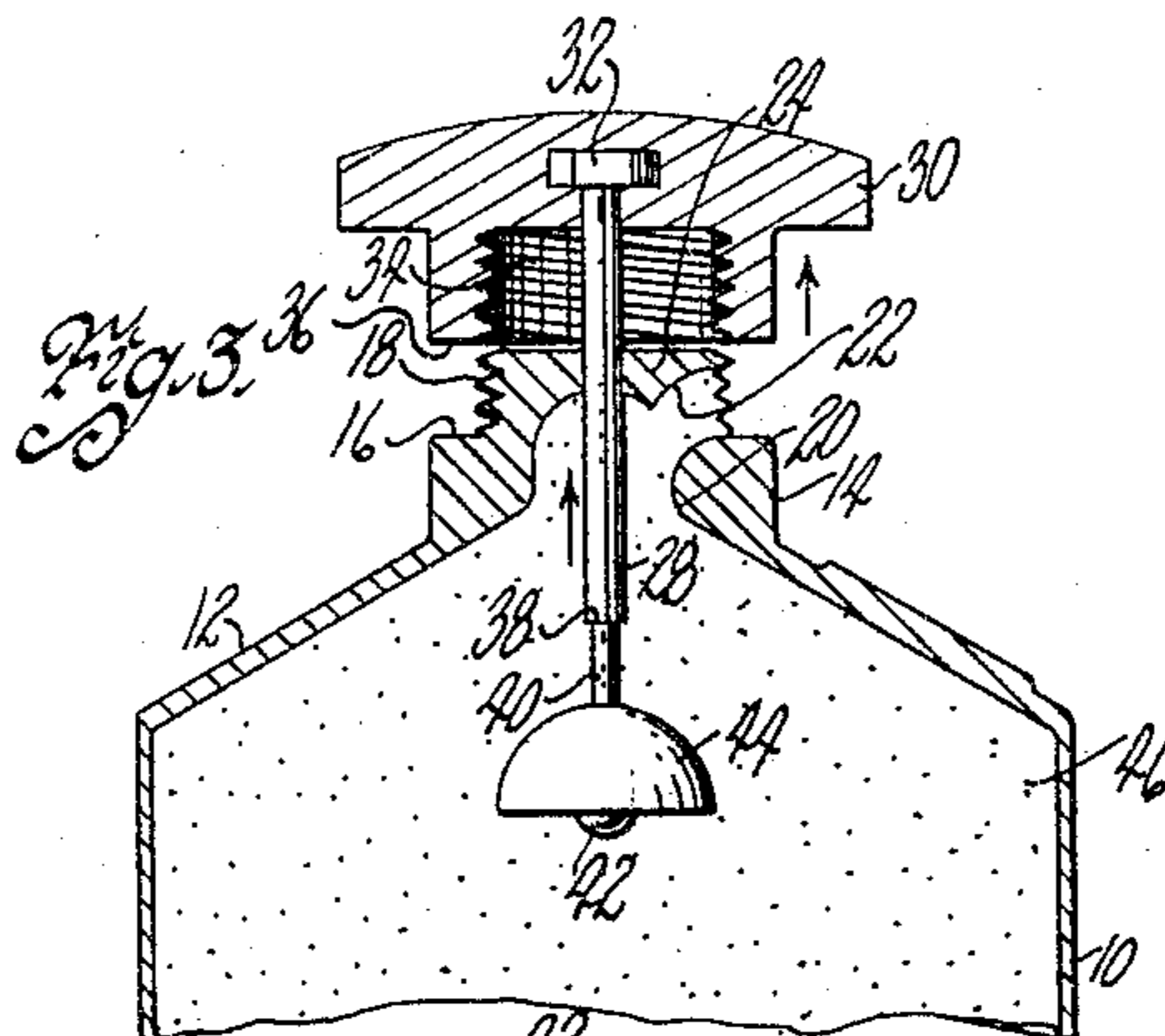
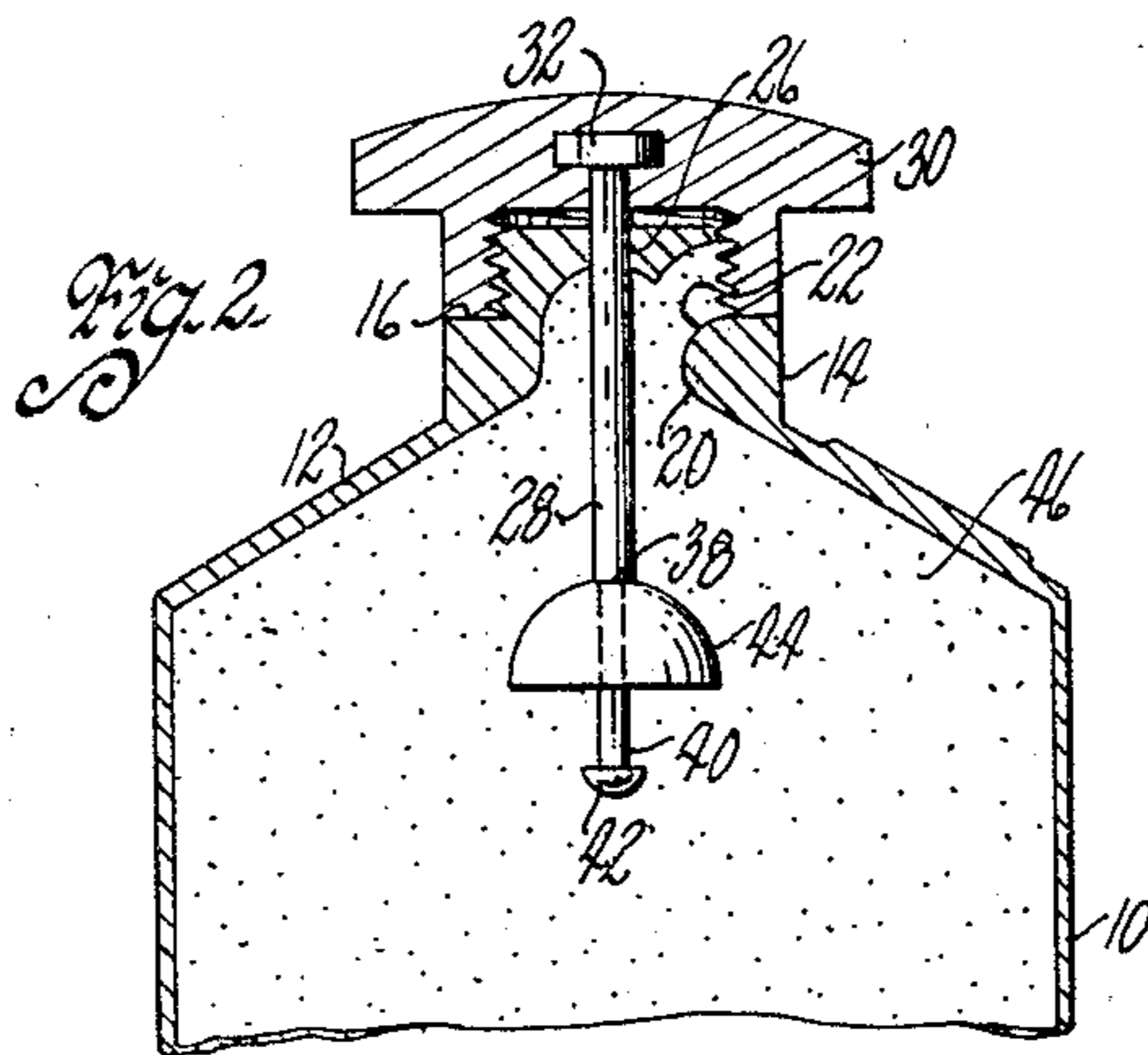
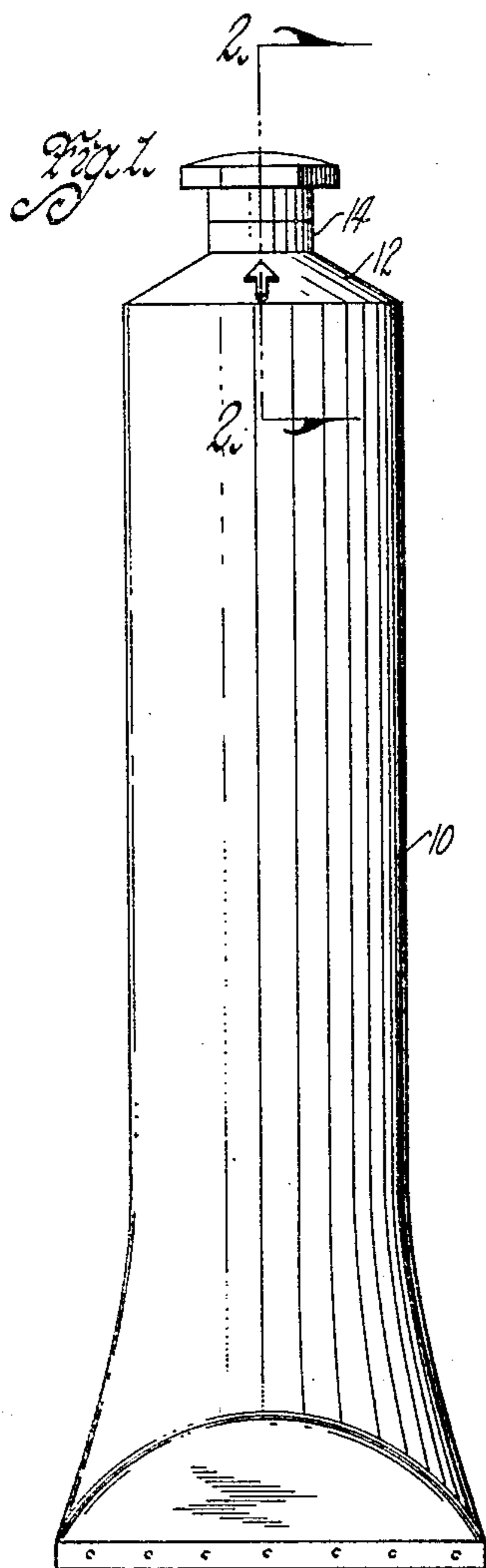
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R. N. ELLIS

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COLLAPSIBLE TUBE CLOSURE

Filed Feb. 8, 1932



Witness  
Edw. Seely

Inventor  
Ralph N. Ellis  
By Bair, Freeman & Sinclair  
Attorneys

# UNITED STATES PATENT OFFICE

RALPH N. ELLIS, OF DES MOINES, IOWA

## COLLAPSIBLE TUBE CLOSURE

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The object of my invention is to provide a collapsible tube closure which is simple, durable and comparatively inexpensive to manufacture.

5 A further object is to provide a closure cap for a collapsible tube which cannot be entirely detached from the tube and lost.

Still a further object is to provide a closure cap having a pin extending into the collapsible tube and provided with a valve plug so that when the closure cap is detached and then pulled outwardly a charge of the plastic material within the tube will be discharged and successive charges will be of substantial-  
15 ly the same size.

A further object is to provide a valve plug which is slidable relative to the pin and which is attached to the closure cap so as to prevent expelling any of the plastic substance while the closure cap is being unscrewed.  
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With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawing, in which:  
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Figure 1 is a side elevation of a collapsible tube showing my closure cap connected therewith.  
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Figure 2 is an enlarged sectional view on the line 2—2 of Figure 1.

Figure 3 is a sectional view similar to Figure 2, showing the parts in a different position with the detachment of the closure cap just completed.  
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Figure 4 is a side elevation showing the closure cap pulled outwardly for discharging a charge of plastic material; and  
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Figure 5 is a view similar to Figure 3, showing the parts in the position of Figure 4 and the charge of plastic material removed from the collapsible tube.

On the accompanying drawing I have used the reference numeral 10 to indicate the container portion of the collapsible tube. The container 10 has a head 12 terminating in a neck 14. The neck 14 has a shoulder 16 beyond which a threaded portion 18 extends.  
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A valve seat 20 is formed within the tube 10 and a passageway 22 extends from the valve seat 20 and leads through the threaded portion 18. The passageway 22 is located between the shoulder 16 and a closed end 24 of the neck 14.  
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The closed end 24 is provided with a perforation 26 through which a pin 28 extends. The pin 28 is connected with a closure cap 30. The pin 28 may be of metal and provided with an enlarged head 32. The closure cap 30 may be of Bakelite or other composition moulded around the head 32. The tube 10 and neck 14 are usually made of die cast metal.  
60 65

The closure cap 30 is internally threaded as indicated at 34 for coaction with the threaded portion 18 of the neck 14. The lower end 36 of the closure cap 30 is adapted to coact with the shoulder 16 when the closure cap is in closed position as shown in Figure 2.  
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The inner end of the pin 28 is shouldered as indicated at 38 and reduced as indicated at 40. The reduced portion 40 terminates in a head 42. A valve plug 44 is slidable on the reduced portion 40 between the shoulder 38 and the head 42. The valve plug 44 is adapted for seating against the valve seat 20.  
75 80

### *Practical operation*

In the operation of my closure cap for collapsible tubes the parts originally assume the position shown in Figure 2 with the closure cap in closed position.  
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When it is desired to remove a charge of the plastic material 46 from the tube 10, the closure cap 30 is first rotated for detachment as shown in Figure 3.

The reduced portion 40 of the pin 28 is of substantially the same length as the travel of the closure cap 30 from the position of Figure 2 to the position of Figure 3. This prevents any upward movement of the valve plug 44 while detaching the closure cap and consequently eliminates any expulsion of the plastic material 46 from the discharge passageway 22 which would occur if the valve plug 44 moved upwardly with the pin 28 during the closure cap detachment operation.  
90 95 100

After the parts are in the position of Figure 3, the cap 30 may be pulled outwardly as shown in Figure 4 and the valve plug 44 will cause discharge of a charge 46a of the plastic material so that it can be taken on a shaving brush 48 or the like. My invention is designed for plastic shaving soap or any other plastic material, such as tooth paste or the like.

10 The charge 46a may now be wiped off by the brush 48 as shown in Figure 5. If more plastic material is required, the pin 28 can be pushed inwardly and then pulled outwardly again.

15 When it is desired to close the tube, the cap 30 is pushed inwardly and inward movement of the valve plug 44 will tend to draw the plastic material inwardly from the discharge passageway 22 so as to prevent any squeezing of material from between the threads 34 and 20 18 and across the shoulder 16 when the cap is finally screwed to fully closed position.

The lost motion connection provided by sliding of the valve plug 44 on the reduced 25 portion 40 of the pin 28 is quite important to prevent squeezing of the plastic material into the threads of the neck and closure cap during the detachment operation. The valve plug 44, when in the position of Figure 5, 30 quite effectively closes the collapsible tube against further discharging of its contents if it is desired to leave the tube open while the user is shaving himself. The particular arrangement of parts also effectively pre- 35 vents losing of the closure cap from the tube.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it 40 is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

45 1. In a collapsible tube construction, the combination with a container portion and a neck thereon, said neck having an interior valve seat, an exterior shoulder, a threaded 50 portion beyond said shoulder, the end of said threaded portion being closed, except for a perforation therein and said neck having a discharge passageway from said valve seat laterally through the threads of said thread- 55 ed portion with its outer end located between said shoulder and the closed end of said neck, of a closure for said neck comprising a closure cap interiorly threaded to fit the threaded portion of said neck and against 60 said shoulder, a pin connected with said closure cap, projecting therefrom and extending through the perforation of said closed end of said neck, the inner end of said pin being shouldered and reduced and terminat- 65 ing in an enlarged head and a valve plug

slidable on said pin between said shoulder and said head.

2. In a collapsible tube construction, the combination with a container portion and a neck thereon, said neck having an interior 70 valve seat, an exterior shoulder, a shank portion beyond said shoulder, the end of said shank portion being closed except for a perforation therein and said neck having a discharge passageway from said valve seat lat- 75 erally through said shank portion and terminating between said shoulder and said closed end of said neck, of a closure for said neck comprising a closure cap to fit over said shank portion of said neck and against said 80 shoulder, a pin connected with said cap, projecting therefrom and extending through the perforation of said closed end of said neck, the inner end of said pin being shouldered and reduced and terminating in an enlarged 85 head and a valve plug slidable on said pin between said shoulder and said head.

3. In a collapsible tube construction, the combination with a container portion and a neck thereon, said neck having an interior 90 valve seat, an exterior shoulder, a threaded portion beyond said shoulder, the end of said threaded portion being closed, except for a perforation therein and said neck having a discharge passageway from said valve seat 95 laterally through the threads of said threaded portion with its outer end located between said shoulder and the closed end of said neck, of a closure for said neck comprising a closure cap interiorly threaded to fit the 100 threaded portion of said neck and against said shoulder, a pin connected with said closure cap, projecting therefrom and extending through the perforation of said closed end of said neck and a valve plug on the in- 105 ner end of said pin for coaction with said valve seat.

4. In a collapsible tube construction, the combination with a container portion and a neck thereon, said neck having an interior 110 valve seat and being exteriorly threaded, the end of said neck being closed, except for a perforation therein and said neck having a discharge passageway from said valve seat laterally through the threads of said neck, of 115 a closure for said neck comprising a closure cap interiorly threaded to coact with the threaded portion of said neck, a pin connected with said closure cap, projecting therefrom and extending through the perforation 120 of the closed end of said neck, the inner end of said pin being shouldered and reduced and terminating in an enlarged head and a valve plug slidable on said pin between said shoulder and said head. 125

5. In a collapsible tube construction, the combination with a container portion and a neck thereon, said neck having an interior 130 valve seat and being exteriorly threaded, the end of said neck being closed, except for a

perforation therein and said neck having a discharge passageway from said valve seat laterally through the threads of said neck, of a closure for said neck comprising a closure  
5 cap interiorly threaded to coact with the threaded portion of said neck, a pin connected with said closure cap, projecting therefrom and extending through the perforation of the closed end of said neck, and a valve  
10 plug on the inner end of said pin for coaction with said valve seat.

6. For use with a collapsible tube neck having a closed end and a shoulder, said closed end having a perforation, a threaded  
15 portion beyond said shoulder and a valve seat within said neck and said neck having a passageway from said valve seat and laterally through the threads thereof, a threaded closure cap adapted to seat against said shoulder,  
20 a pin rigid therewith and projecting through said perforation and a valve plug on the inner end of said pin for coaction with said valve seat.

7. For use with a collapsible tube neck having a closed end and a shoulder, said closed  
25 end having a perforation, a threaded portion beyond said shoulder and a valve seat within said neck and said neck having a passageway from said valve seat and laterally through the threads thereof, a threaded closure cap  
30 adapted to seat against said shoulder, a pin rigid therewith and projecting through said perforation, a valve plug on the inner end of said pin for coaction with said valve seat,  
35 said valve plug having limited sliding movement relative to said pin substantially the distance of the movement of said closure cap from position against said shoulder to detached position.

40 Des Moines, Iowa, November 4, 1931.  
RALPH N. ELLIS.

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