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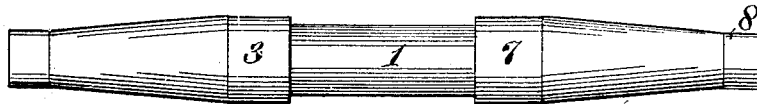
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G. N. HEIN

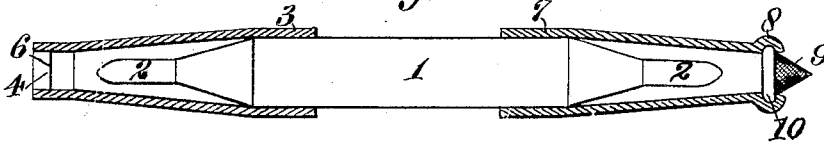
MEANS FOR CONTROLLING THE FLUID OUTLET OF AMPULES

Filed April 16, 1927

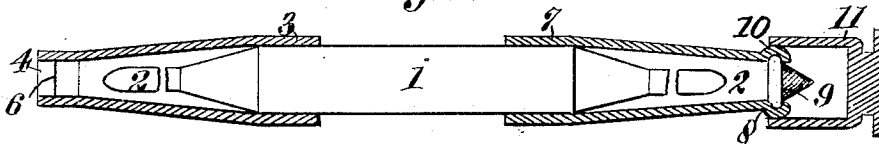
*Fig. 1.*



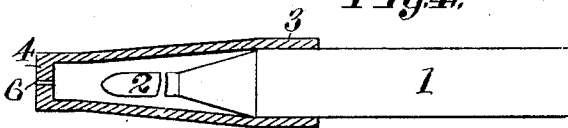
*Fig. 2.*



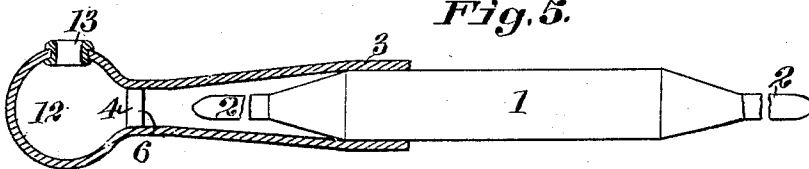
*Fig. 3.*



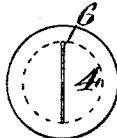
*Fig. 4.*



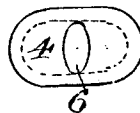
*Fig. 5.*



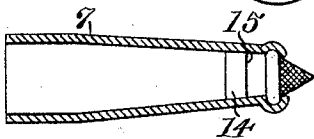
*Fig. 6.*



*Fig. 7.*



*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

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MEANS FOR CONTROLLING THE FLUID OUTLET OF AMPULES.

Application filed April 16, 1927. Serial No. 184,198.

The present invention relates to the means for controlling the transferring or discharge of fluid from the outlet of ampules, and is particularly adapted for use in connection with ampules generally.

The objects of the invention are to provide a means for controlling the discharge of fluid from the outlet of ampules; to provide a means for filtering the discharged fluid prior to its admission into the barrel of a hypodermic syringe or other suitable receptacle, and to provide a quick and positive means for sealing partially used ampules to preclude the circulation of air therethrough.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

To more fully comprehend the invention, reference is directed to the accompanying drawings, wherein—

Fig. 1 is a view in side elevation of an ampule showing the tubular sleeve members in position on each pointed end thereof.

Fig. 2 is a view in side elevation of a double end ampule, illustrating in longitudinal section the sleeve members in position, one being provided with a filtering screen, and the end of the other being provided with a yieldable compression valve.

Fig. 3 is a view similar to Fig. 2, showing a cap covering the filtering means, the ends of the ampule being fractured.

Fig. 4 illustrates a single end ampule with the sleeve member in position embracing its fractured discharge end.

Fig. 5 is a view in side elevation of an ampule with the sleeve embracing its tapered end, the sleeve at its outer end being provided with a yieldable bulb having a vent therein.

Fig. 6 is a view in end elevation of a sleeve showing the compression valve in its normal or closed position.

Fig. 7 illustrates the compression valve in its compressed or open position. Fig. 8 is a view in detail of the sleeve carrying the

filtering screen and provided with a yieldable compression valve.

Referring to the drawings, wherein like characters of reference indicate corresponding parts, the numeral 1 designates a conventional thin glass ampule preferably pointed at its opposite ends as at 2, although the same may be pointed only at one end at 2—Fig. 4. Over one end of the ampule is tightly fitted or stretched an elastic tubular sleeve 3. The free end of the sleeve is normally closed by a compression valve, illustrated as comprising a yieldable wall 4, disposed transversely of the end of the sleeve and provided with an elongated slit 6, the edges of which are normally in meeting relation to the slit, constituting a valve opening. The wall 4 may be integral with or a part separate from the sleeve so long as it extends transversely of the sleeve and is provided with an opening capable of being distorted. The other end of the ampule may also be provided with an elastic tubular sleeve 7 detachably carrying at its free end 8 a conical filtering screen 9, the base 10 of which is embraced by the end 8 of the sleeve—Figs. 2 and 3.

The elastic sleeves after positioning on opposite ends of the ampule are gripped between the fingers and are given a slight lateral movement when it is desired to fracture the ampule ends, as shown in Figs. 3, 4 and 5, the fracturing affording the fluid to flow from the ampule by gravity when tipped on end and air is admitted to the upper end of the ampule. This air admission is controlled by compressing the wall 4 endwise of the slit 6, as shown in Fig. 7. If desired, a sealing cap 11 may be fitted over the outer end of sleeve 7, as shown in Fig. 3, closing the end of sleeve 7 and sealing the unused contents of said ampule against spoiling.

Fig. 5 illustrates a construction wherein the end of the sleeve 3 beyond the slotted wall 5 is extended to form a yieldable bulb structure 12, provided with a finger controlled air vent 13. This structure is particularly adapted for forcing the fluid under pressure from the ampule where speed is required or where the density of the fluid contents of the ampule is too great to pass by gravity through the filtering screen 9.

In operation, with the sleeve 3 positioned over one end of the ampule, and the sleeve 7 preferably over the other end, the ends of

the ampule are fractured; the slit walls of sleeve 3 are compressed endwise of the slit 6, as shown in Fig. 7, opening the slit, thereby admitting air into the ampule, allowing the fluid to discharge by gravity from its opposite fractured end, and if sleeve 7 is in position the fluid passes through the filtering screen 9 into any desired receptacle. Where the density of the fluid is too great to pass through the filtering means, the sleeve (Fig. 5) carrying the bulb structure 12 at its free end, may be used. In this construction, the air vent 13 is closed by placing the finger thereover and the bulb compressed, which forces air through the slit 6 in the wall 5, thus forcing the fluid under pressure from the ampule and through the filtering means. When the finger is removed from the air vent 13 and the same is opened to allow air to enter the bulb structure, and pressure on the bulb is released, the bulb assumes its normal position, the slit in the wall closes, and precludes the admission of air into the ampule.

One end 2 of the ampule may be fractured and removed prior to placing the sleeve 3 thereover, and when the opposite end is broken, the ampule contents will be precluded from flowing therefrom until such time as the slit 6 of the sleeve is opened, admitting air into the ampule.

The sleeve 3 with the bulb structure 12 at its end may be used as previously described to force the fluid under compression from the ampule or the same may be used in the same manner, as the sleeves 3, illustrated in Figs. 1 to 4 inclusive. When used to control the gravity flow of the ampule contents it is only necessary to compress the wall 5 endwise of the slit 6, the necessary air to displace the fluid discharging from the ampule being admitted through the normally open vent 13.

In Fig. 8 the sleeve 7 is illustrated as being provided intermediate of its ends with a transverse wall 14 provided with a slit 15

adapted on endwise compression to open and close.

It is to be understood that the screen or filtering member may be positioned on either side of the wall 14 in accordance with manufacturing advantages.

With the sleeve 7 equipped as designated, it will be apparent that both slits 6 and 15 must be simultaneously opened to admit of the flow of fluid from the interior of the ampule.

I claim:—

1. A device for controlling the discharge of fluid from an ampule through its fractured end comprising a tubular elastic body open at one end with its open end adapted for stretching over and receiving one end of said ampule, said body provided with a transversely disposed elastic wall normally closing the body inwardly from its open end, said wall provided with a normally closed vent adapted for distortion and opening on pressure being applied longitudinally of the wall transversely of the elastic body.

2. In combination with a fluid containing ampule having pointed ends; a pair of yieldable tubular members, one stretched over each of said ends; an elastic wall disposed transversely across the free end of one of said tubular members, said elastic wall provided with a slit adapted for distortion to provide a vent; and means carried by the other member for filtering the discharged fluid.

3. An elastic tubular member for stretching over one tapered end of a fragile fluid containing ampule, said member comprising a tubular elastic body open at one end and provided with a compressible bulb at its other end; and a slit elastic wall disposed transversely of said tubular member at a point between the compressible bulb and the open end of the body.

In testimony whereof I have signed my name to this specification.

GEORGE N. HEIN.