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G. N. HEIN

1,744,893

HYPODERMIC SYRINGE

Filed Oct. 2, 1926

Fig. 1.

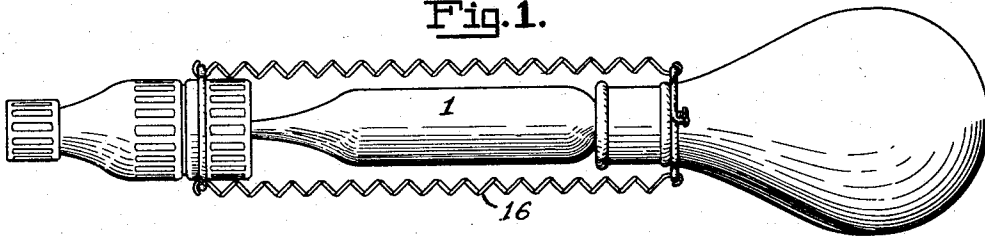


Fig. 2.

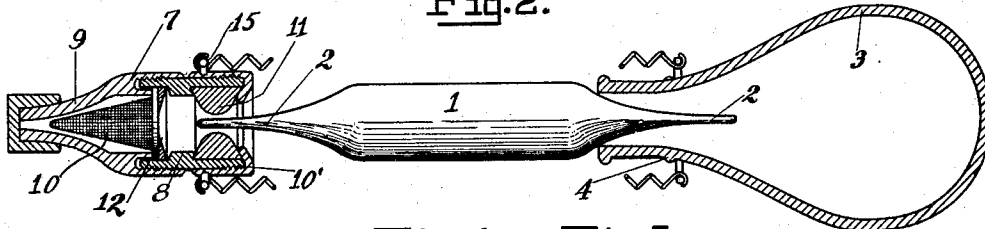


Fig. 3.

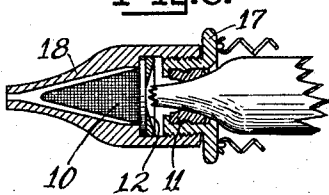


Fig. 4.

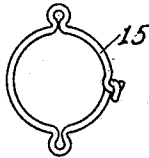


Fig. 5.

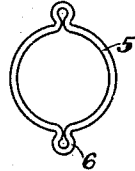
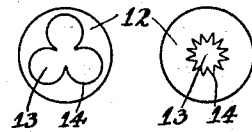


Fig. 6. Fig. 7.



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HYPODERMIC SYRINGE

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This invention relates to the filtering or removal of foreign bodies from fluids, particularly those fluids used by the medical profession for injection by hypodermic syringes. Such fluids are almost universally contained in ampules, one or both ends of which are broken or fractured to permit of the fluid contents to be removed therefrom and transferred into a syringe for injection. The ampule end breaking or fracturing, often releases minute particles of glass, the material from which the ampule is formed, and this, at times, finds its way into the fluid within the syringe, and when injected into the patient, sets up irritation which may have serious results.

It is the removal of this foreign material that the present invention has for its principal object; either its removal or separation from the fluid prior to the fluid entering the syringe or prior to its passing through the syringe discharge orifice.

The invention contemplates the utilization of fine mesh filtering material, so positioned as to necessitate the passage through the same of the fluid in its transference from the ampule to the patient. The invention also contemplates an ampule end fracturing device in connection with a fluid straining or filtering mechanism, whereby the fracturing of the ampule end or ends will be facilitated.

With these and other objects in view, the invention consists in the assembly and arrangement of parts and elements hereinafter described and illustrated in the accompanying drawings; variations in the invention and its respective embodiment may be made within the scope of the claims hereto appended.

To more fully comprehend the invention, reference is directed to the accompanying drawings, forming a part of this specification, wherein—

Fig. 1 is a view in side elevation of an ampule with one embodiment of my invention associated therewith, there being disclosed a

compression bulb and a coupling held to the ampule by spring means.

Fig. 2 is a longitudinal sectional view through the embodiment, illustrated in Fig. 1.

Fig. 3 is a slightly modified form of coupling member, illustrating particularly the tip severing member for the ampule.

Fig. 4 is a view in plan of the attaching ring carried by the coupling.

Fig. 5 is a similar view of the ring carried by the compression bulb.

Fig. 6 is a view in plan of the preferred form of tip fracturing device.

Fig. 7 is a similar view of a modified form of tip fracturing device.

In the drawings, wherein like characters of reference designate corresponding parts, referring to Figs. 1, 2 and 3, the numerals 1 indicate a conventional form of thin glass ampule, pointed at its ends at 2 and containing a body of fluid. Over one end 3 of the ampule is adapted for positioning a yieldable bulb structure, having a flange 4, bearing on which is a ring 5 having ears 6. On the other end of the ampule is adapted for positioning a tubular coupling member 7. In the construction illustrated in Figs. 1 and 2 the same comprises a tubular body 8 carrying at its end a tubular tip 9 enclosing a conical filtering member 10, in the form of a screen, the base of which is held between the body and tip members. The coupling carries at its opposite end a collar 10' which retains within the body a flexible tubular sealing element 11 for engagement with the ampule end wall, as illustrated in Figs. 2 and 3. An ampule end fracturing disk or plate 12 is held within the body 8 and into the opening therein projects one end 2 of the ampule—Fig. 3, which is fractured on a slight lateral movement being imparted to the ampule body while the end is projected in the disk opening 13.

Various forms of disks may be employed as indicated in Figs. 6 and 7, each preferably

formed with an opening having a serrated edge 14.

Within a circumferential groove in the surface of the collar 10' is received an eared ring 15 to which is attached the ends of coiled springs 16, also connected with the ears 6 of ring 5, they drawing the bulb structure 3 and the coupling member 7 toward each other with one end of the ampule received in each.

In this embodiment of the invention a hypodermic needle, not shown, may be secured to the end of the tip 9 and the fluid contents of the ampule may, by the compression of the bulb structure 3, after both ends of the ampule have been broken, be injected directly from the ampule into the patient.

Fig. 3 illustrates a structure in which the body 8 is eliminated, and collar 17 is threaded directly into the base of a tip 18, a filtering screen or element 10 and an ampule end fracturing disk or plate 12 being positioned in the tip chamber between the inner end of the collar 17 and the inner wall of the tip 18.

In all embodiments of the present invention it will be apparent that a filtering element is employed, and through which the fluid from the ampule passes at some period prior to being discharged from the syringe barrel into the patient, and while this filtering element is preferably in the form of an extremely fine mesh metallic cloth, and is illustrated as of mesh material, it is to be understood that the same may be of such construction as to afford a means for efficiently filtering the fluid as the same passes there-through.

I claim:—

1. In a syringe structure including a fluid containing ampule forming a syringe barrel, a tubular tip for receiving one end of the ampule and through which the fluid passes from the ampule, means within the tip for fracturing the end of the ampule, and means removably positioned within the tip for receiving the fractured portion of the ampule and through which the ampule fluid passes prior to discharging from the tip.

2. In a syringe structure including a fluid containing ampule forming a syringe barrel, a tubular tip for receiving one end of the ampule, a compressible bulb for receiving the other end of the ampule, straining means through which the ampule fluid passes prior to discharging from the tip, means within the tip for fracturing the end of the ampule, and means connecting the tip and bulb for removably retaining the same on opposite ends of the ampule.

3. In a syringe structure including a fluid containing barrel forming member, a tubular tip associated therewith for supporting a hypodermic needle and consisting of threadably connected tubular members, a screen device within the tip, its base flange clamped between said members.

4. In a syringe structure including a fluid containing barrel forming member, a tubular tip associated therewith for supporting a hypodermic needle and comprising a pair of threadably connected tubular members, an elastic ring carried by one of the members for yieldably engaging the barrel end, and a conical screen within the tip, its base clamped between said members.

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

GEORGE N. HEIN.