

No. 798,093.

PATENTED AUG. 29, 1905.

E. F. DEAN.  
HYPODERMIC SYRINGE.  
APPLICATION FILED MAY 11, 1904.

2 SHEETS—SHEET 1.

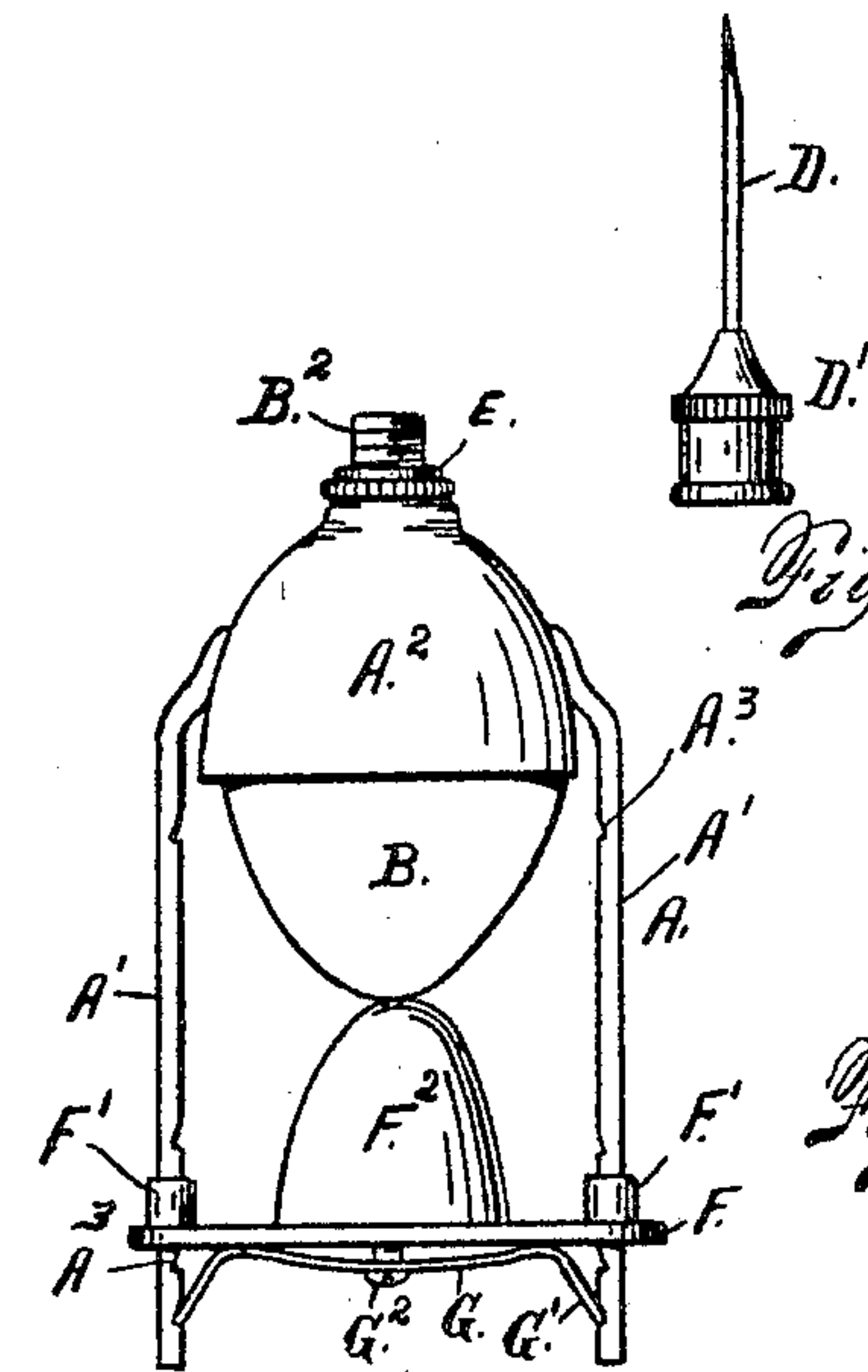


Fig. 1.

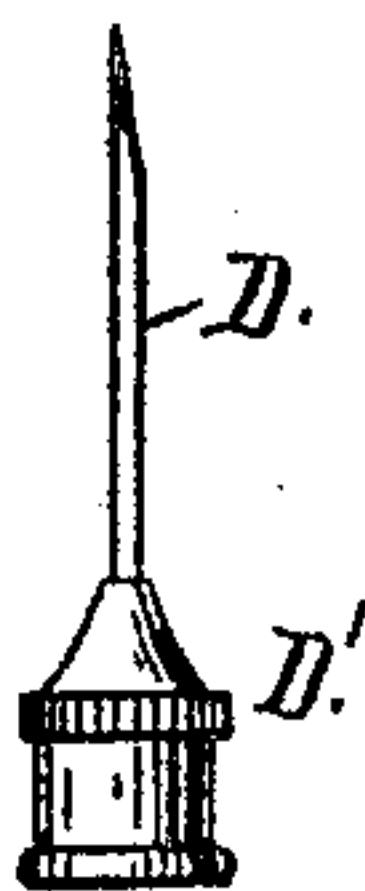


Fig. 2.

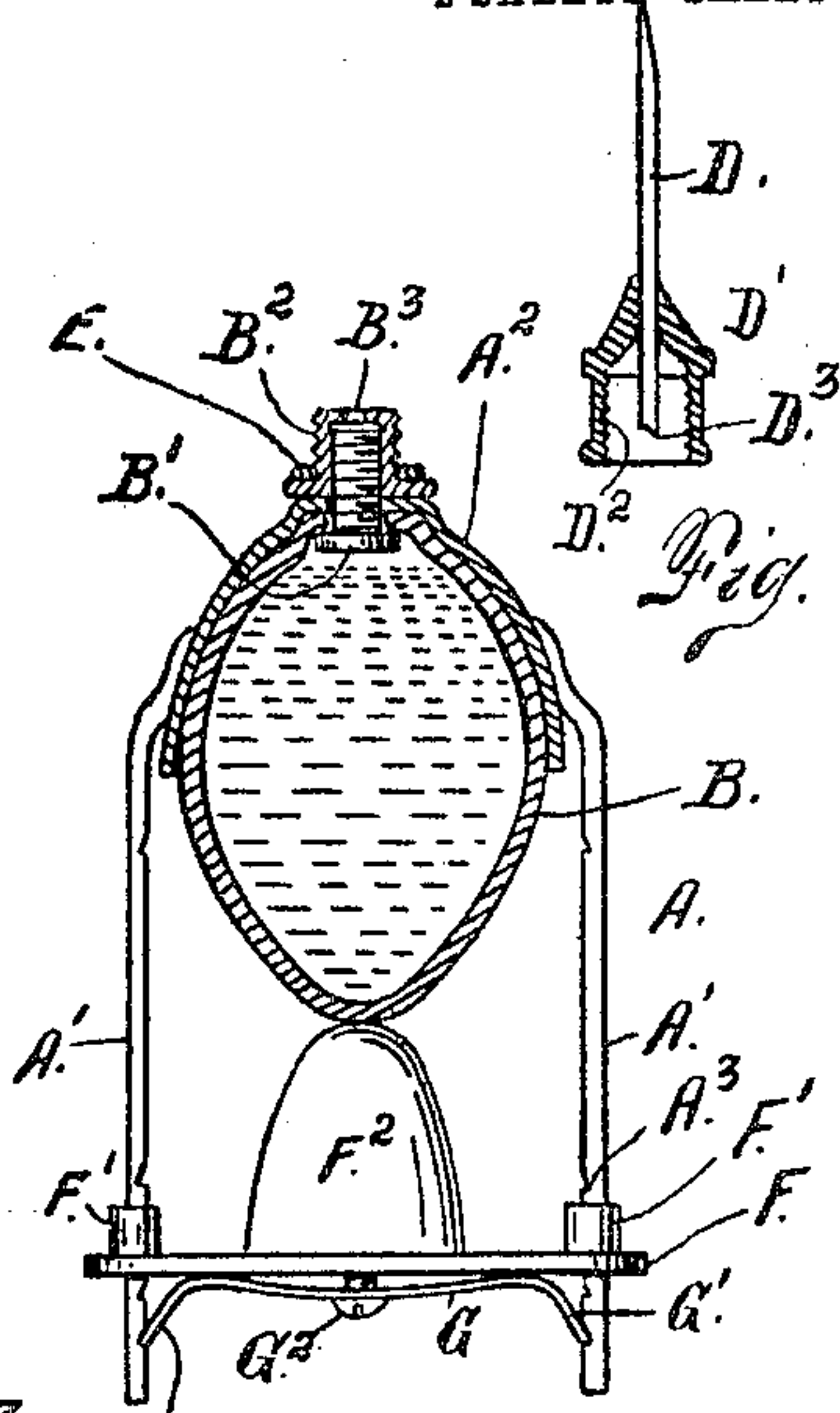


Fig. 3.

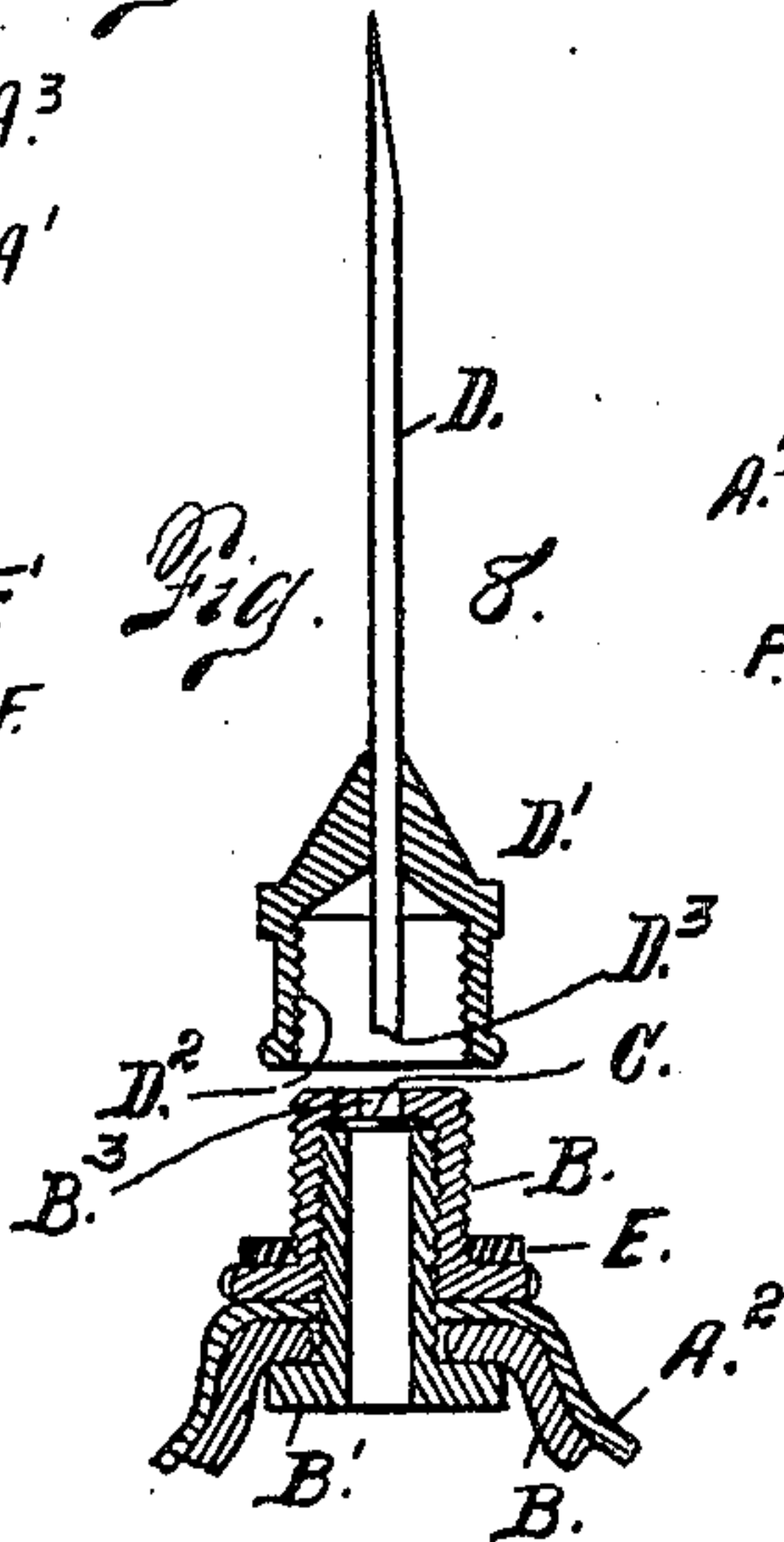


Fig. 4.



Fig. 5.

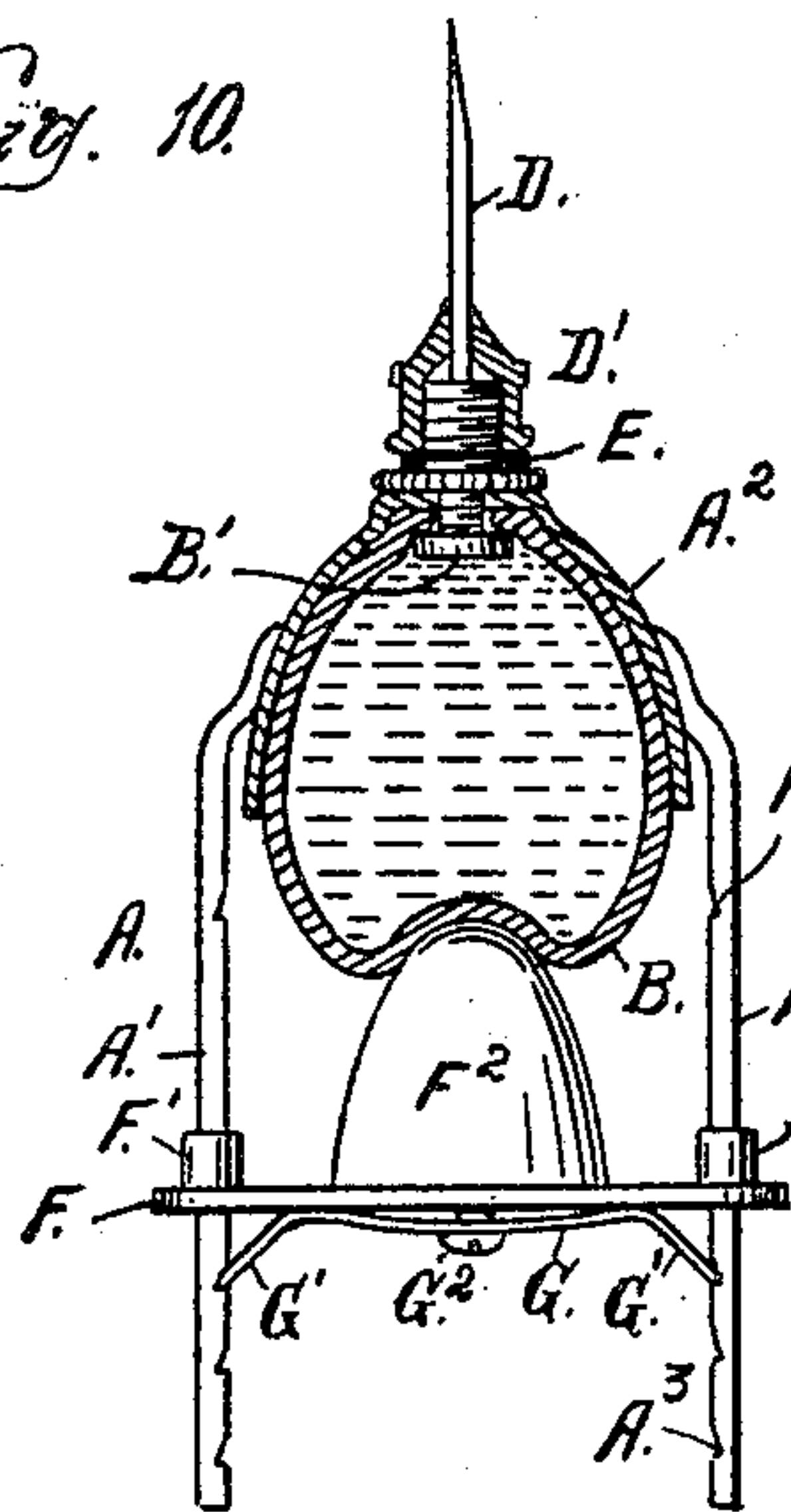


Fig. 6.

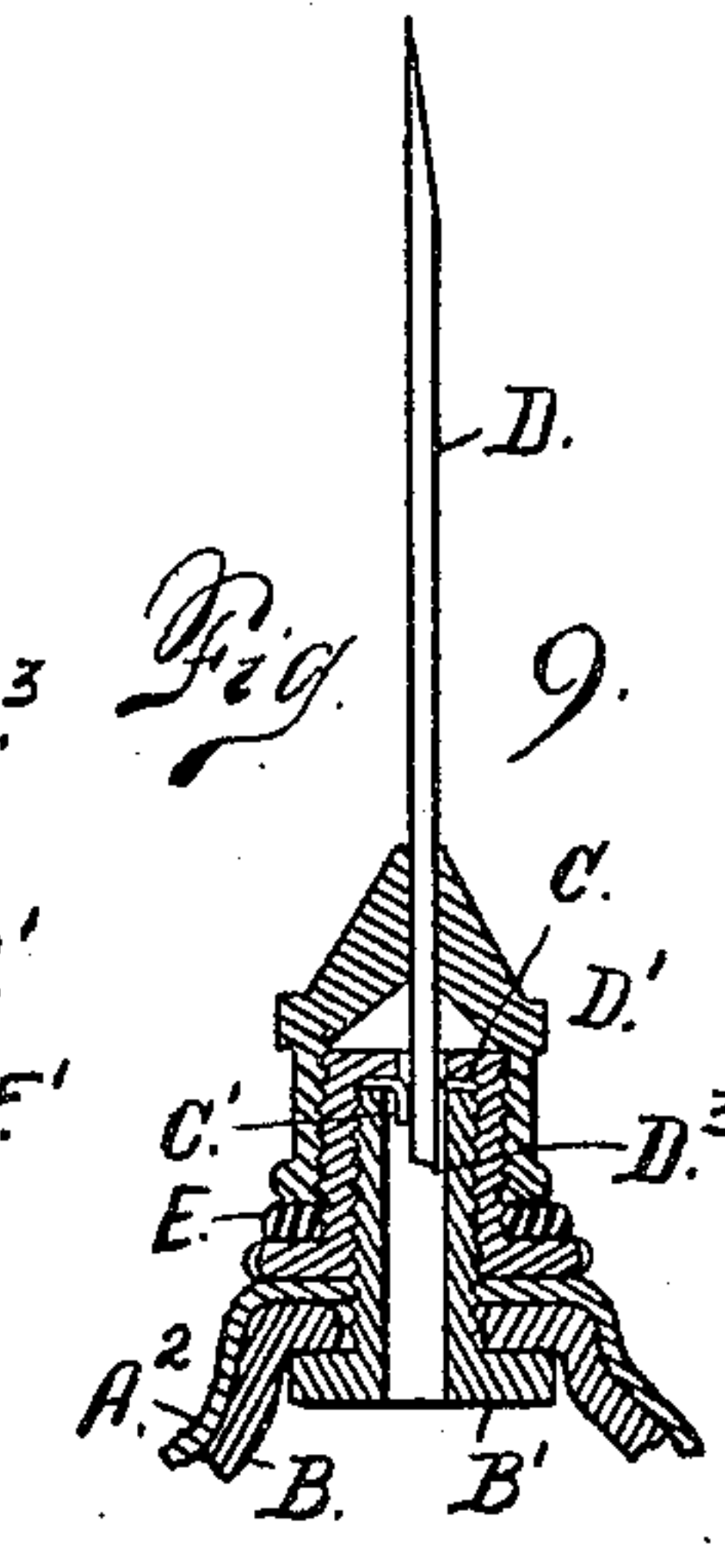


Fig. 7.

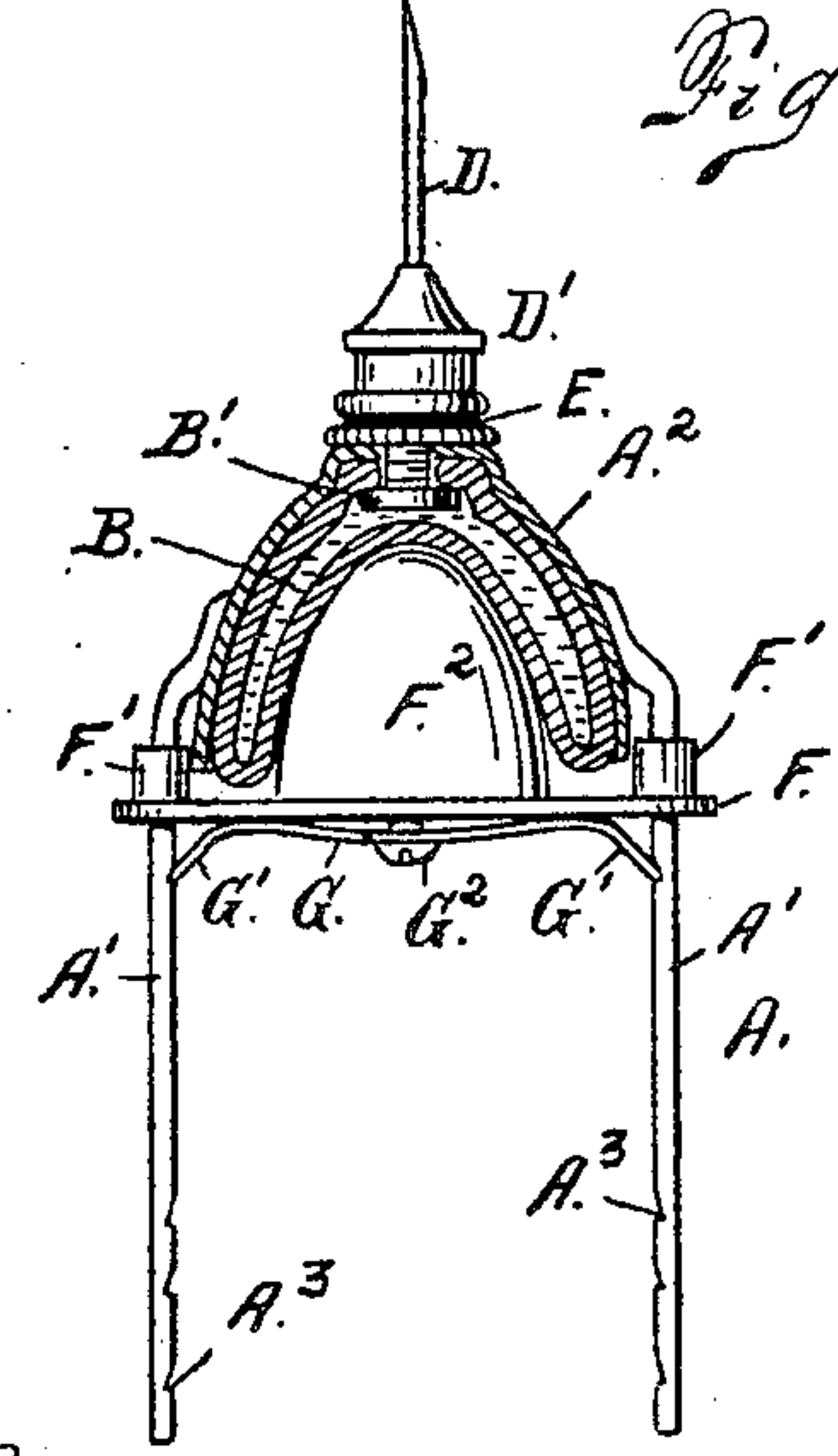


Fig. 8.

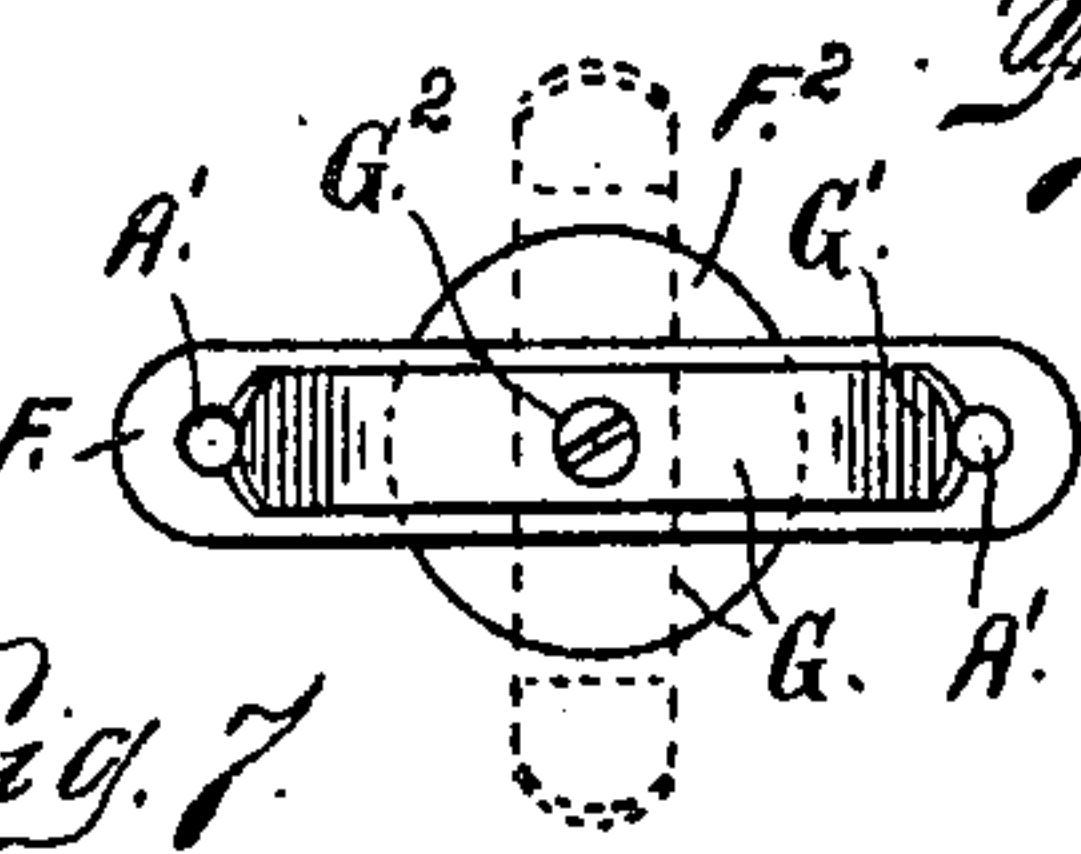


Fig. 9.

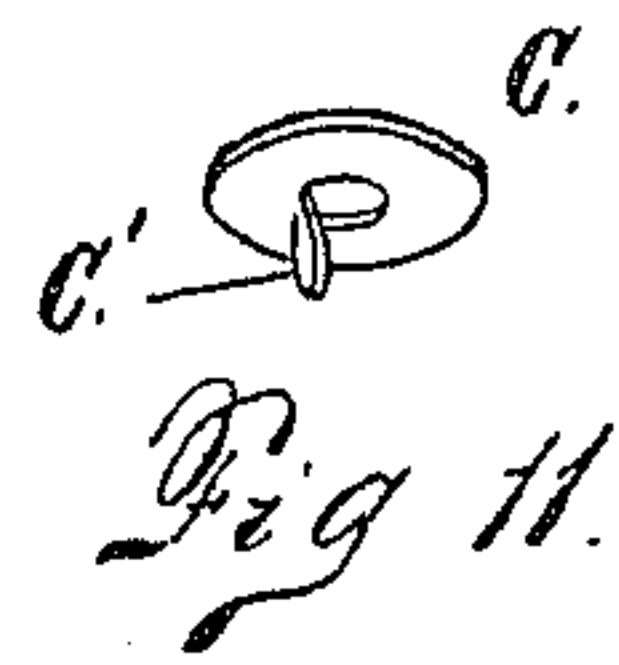


Fig. 10.

Witnesses  
Otto C. Hoddick.  
Lena Nelson.

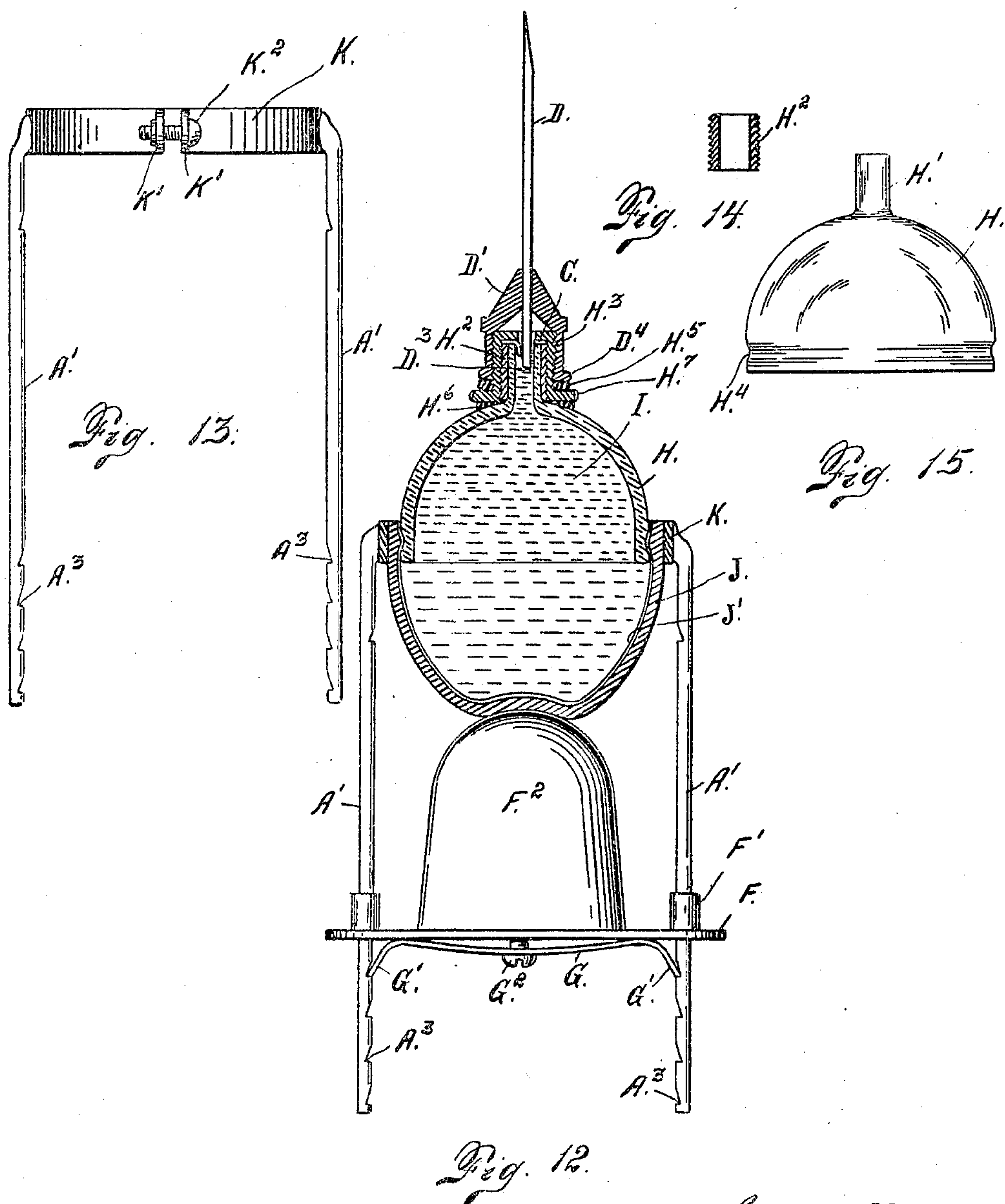
Edward F. Dean.  
Inventor  
by *[Signature]*  
Attorney

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2 SHEETS—SHEET 2.



Witnesses  
Otto E. Haddock.  
Lena Nelson.

Edward F. Dean.  
Inventor  
by *[Signature]*  
Attorney



# UNITED STATES PATENT OFFICE.

EDWARD F. DEAN, OF DENVER, COLORADO.

## HYPODERMIC SYRINGE.

No. 798,093.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed May 11, 1904. Serial No. 207,496.

*To all whom it may concern:*

Be it known that I, EDWARD F. DEAN, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Hypodermic Syringes; and I do declare the following to be a full, clear, and exact description of the invention, such as it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in hypodermic syringes of the class set forth in my application, Serial No. 196,620, filed March 4, 1904.

My present invention consists of certain improvements on the construction set forth in the aforesaid application. In my improved construction the container is normally closed by a thin washer before the needle is applied. The needle is mounted in a screw-cap and has an interiorly-projecting part adapted to pierce the washer or valve, thus opening the container to allow its contents to pass through the needle as the syringe is operated. The follower of the device is also provided with a spring whose extremities engage notches on the arms of the frame, whereby the follower may be locked in any desired position of adjustment. Furthermore, the front part of the container of my improved construction may consist of glass, to which is clamped a rearwardly-extending collapsible portion lined with thin metal. In the operation of the device the projection of the follower acts on the rear collapsible portion to force the latter into the forward or glass portion of the container, whereby the liquid is ejected through the needle. The collapsible portion of the container is clamped to the glass portion, the latter having a circumferential groove in the plane of the clamp, whereby a liquid-tight joint is formed between the collapsible part and the glass part.

Having briefly outlined my improved construction, as well as the function it is intended to perform, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is an elevation of my syringe with the needle removed. Fig. 2 is an elevation of the needle. Figs. 3 and 4 are sections of the construction shown in Figs. 1 and 2. Fig. 5 is a view of the complete syringe, the container and the needle-holder being shown in section and the follower moved to engagement with the collapsible portion of the bulb sufficiently to expel the air from the container. Fig. 6 is a detail view of the device with the follower moved to its forward limit of movement. Fig. 7 is a detail view of the follower with the spring-catch shown in two positions, one in full lines and the other in dotted lines. Fig. 8 is a fragmentary detail view of the container, showing the needle detached. Fig. 9 is a similar view showing the parts assembled. Fig. 10 shows the valve-washer, on a larger scale, previous to puncturing. Fig. 11 shows the valve-washer after it has been punctured. Fig. 12 is a view, on a larger scale, showing another form of construction, the container being shown in section. Fig. 13 is a detail view of the clamping-ring and the frame-arms mounted thereon. Fig. 14 is an exteriorly-threaded metallic sleeve mounted on the neck of the glass container. Fig. 15 is a detail view of the container.

The same reference characters indicate the same parts in all the views.

Referring first to Figs. 1 to 11, inclusive, let A designate the body of the device considered in its entirety. A' designates arms, to the forward extremities of which is attached a part A<sup>2</sup>, composed of suitable rigid material. Inserted in the part A<sup>2</sup> is a collapsible bulb B, which extends rearwardly beyond the part A<sup>2</sup>, while its forward extremity is connected with the container part A<sup>2</sup> by means of a screw B', whose head clamps the forward extremity of the bulb against the forward extremity of the rigid part A<sup>2</sup>. A nipple B<sup>2</sup> is screwed upon the forwardly-protruding extremity of the screw B'. This screw is hollow and its opening registers with an orifice B<sup>3</sup>, formed in the nipple. Between this orifice and the forward extremity of the screw is placed a small flat valve C, which is normally closed to prevent the escape of the contents of the container. The needle D is made fast in the holder D', having an interiorly-threaded part D<sup>2</sup>. The rear extremity of the needle pro-



trudes into the part  $D^2$  and is slightly elongated at one side, as shown at  $D^3$ , and formed sharp, while the other side is dull. The needle-holder is adapted to screw upon the nipple  $B^2$ , and as it is moved to engagement with a packing-washer  $E$  the inwardly-protruding part  $D^3$  of the needle pierces the valve-washer, whereby the contents of the container are free to escape through the needle when the follower is properly actuated. This follower consists of a plate  $F$ , provided with sleeves  $F'$ , adapted to fit the arms  $A'$  of the frame, whereby the plate is free to slide easily on the frame-arms. This plate  $F$  is provided with a forwardly-extending projection  $F^2$ , adapted to engage the collapsible portion of the bulb and expel the contents of the container as the follower is moved to the position shown in Fig. 6. Upon the follower-plate  $F$  is mounted a spring  $G$ , whose extremities  $G'$  engage notches  $A^3$ , formed in the arms  $A'$  as the follower is moved forwardly. This spring is connected with the follower-plate by a screw  $G^2$ , whereby the follower may be released to permit the return movement by turning the spring-catch to disengage the notches of the arms  $A'$ . The catch may be turned to the position shown by dotted lines in Fig. 7 or to any other intermediate position, so that the extremities  $G'$  of the spring will not catch upon the notches  $A^3$ .

In the form of construction shown in Figs. 12 to 14, inclusive,  $H$  is a glass container, approximately hemispherical, having a neck  $H'$ , upon which is cemented an exteriorly-threaded sleeve  $H^2$ . To this sleeve is screwed a nipple  $H^3$ , which projects slightly beyond the neck  $H'$  and the sleeve  $H^2$  and is provided with an orifice large enough to receive the rear extremity of the needle. This orifice is normally closed by the valve-washer  $C$  until the needle is applied, as shown in Fig. 12, when the washer is punctured to allow the liquid  $I$  to escape as the follower is actuated. The rear extremity of the container  $H$  is provided with a circumferential groove  $H^4$ , to which is clamped the collapsible rearwardly-extending part  $J$ , having a lining  $J'$  of very thin metal, as silver or other suitable non-corrodible material, sufficiently flexible to allow the bulb to properly act in the performance of its function. This bulb  $J$  is secured to the container  $H$  by means of a clamp  $K$ , having flanged extremities  $K'$ , connected by a clamping-screw  $K^2$ . The arms  $A'$  are made fast to the clamping-screw  $K$ . The follower is substantially the same in this construction as shown in the other views except that the projection  $F^2$  is shown of slightly different shape. Between the circumferential flange  $H^7$ , formed on the nipple  $H^3$ , and a corresponding flange  $D^4$ , formed on the needle-holder, is located a packing-washer  $H^5$ , while a similar washer  $H^6$  is

placed between the container  $H$  and the flange  $H^7$  of the nipple. These features all unite to form a perfect fit and make a liquid-tight joint.

Previous to using the syringe the container (whether of the form shown in Figs. 1, 3, 5, and 6 or in Fig. 12) is first filled with the serum to be used and the nipple  $B$  screwed to position, with the valve-washer  $C$  in place. Then as soon as it is desired to use the device the needle is applied to the nipple, and as it is screwed thereon the rear extremity  $D^3$  punctures the valve-washer to permit the escape of the serum. The part  $C'$ , punched out of the opening, is not cut from the washer, but clings thereto on one side, since the rear extremity of the needle is shaped to effect this result. Then as the follower is forced forwardly the serum is driven out of the container through the needle in a manner well understood.

The valve-washer  $C$  is preferably composed of thin non-corrodible metal.

Having thus described my invention, what I claim is—

1. In a hypodermic syringe, the combination of a container and a valve-washer normally closing the exit-orifice thereof, a needle-holder adapted to be applied to the container, and a needle mounted in the holder and having an inwardly-protruding part adapted to puncture the valve-washer as the needle-holder is applied to the container.

2. In a hypodermic syringe, the combination of a container, a frame connected with the container and having notched arms, a follower mounted on the arms of the container and having a forward projection, the container having a rearwardly-extending collapsible portion which the projection engages as the follower is actuated, and a spring-catch mounted on the follower and whose extremities are adapted to engage the notches of the frame-arms for the purpose set forth.

3. In a hypodermic syringe, the combination of a container provided with a nipple, a needle adapted to be connected with the nipple and having an inwardly-projecting part, and a valve-washer normally closing the escape-opening of the container and consisting of thin material adapted to be punctured by the inwardly-protruding extremity of the needle as the latter is connected with the nipple.

4. A hypodermic syringe provided with a collapsible portion lined with thin non-corrodible metal.

5. A hypodermic syringe provided with a container having a valve normally closing its exit extremity, a nozzle adapted to be connected with the container and provided with an inwardly-projecting part adapted to puncture the valve when the nozzle is applied.

6. A hypodermic syringe comprising a container, a collapsible portion extending rearwardly from the glass container when the bulb is distended, and a follower mounted in suitable relation with the bulb and container and adapted to act on the collapsible bulb as the follower is actuated, a frame connected with the container upon which the follower is slidably mounted, and an interlocking connection

between the frame and follower, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD F. DEAN.

Witnesses:

DENA NELSON,  
A. J. O'BRIEN.