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P. P. GOLAND ET AL

2,389,355

SURGICAL NEEDLE

Filed Jan. 27, 1943

FIG-1

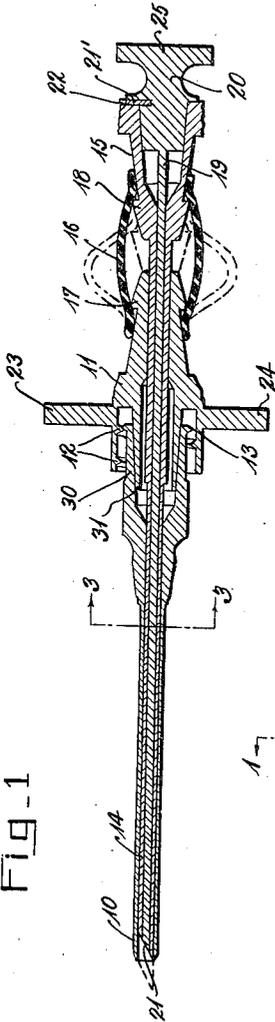


FIG-2

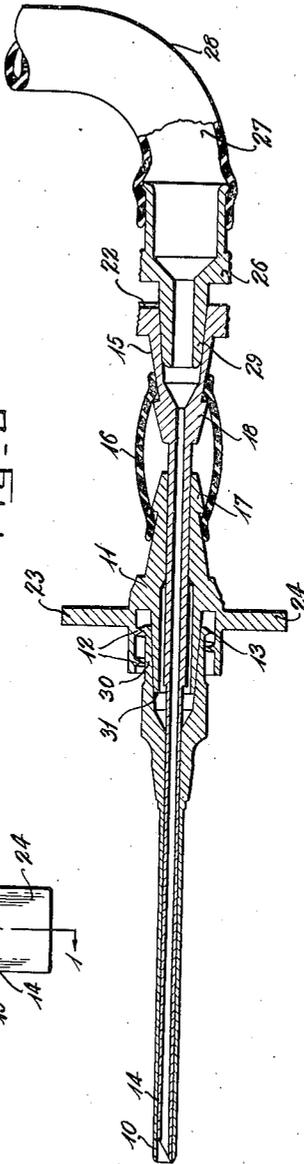
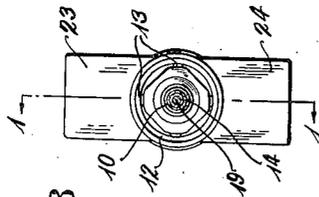


FIG-3



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# UNITED STATES PATENT OFFICE

2,389,355

## SURGICAL NEEDLE

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Application January 27, 1943, Serial No. 473,736

6 Claims. (Cl. 128—214)

The invention relates to intravenous needles and has as an object the provision of a needle having a point which is concealed after insertion.

It is a further object of the invention to provide a needle having a cannula that may be readily removed for cleaning should it be clogged as by a clot.

A further object of the invention is the provision of a needle having provisions for preventing of stoppage of the cannula while being entered.

A still further object of the invention is the provision of a needle so constructed that when the inserting grip of the operator is released, flow of injection fluid will immediately begin.

Further objects of the invention will appear from the following description when read in connection with the accompanying drawing showing an illustrative embodiment of the invention, and wherein:

Figure 1 is a central longitudinal section on line 1—1 of Figure 3;

Fig. 2 is a similar section of the needle with hose attached as when injection is taking place; and

Fig. 3 is a transverse section on line 3—3 of Figure 1.

As shown in Figure 1 the device comprises an outer cannula 10 associated with a base member 11 by means of a quick detachable joint or lock shown as of the form disclosed in Patent No. 1,742,497 and comprising an interior thread 12 coacting with projections 13 carried by the base of the outer cannula. This form of lock is shown for illustration only as any form of quick detachable positive lock such as a bayonet joint may be used.

Slidable within the outer cannula 10 there is shown an inner cannula 14 carried by an adapter base 15. A fluid tight spring connection is shown between base 11 and base 15 in the form of a rubber collar 16, received by the ribbed portions 17, 18 of the bases.

Housed in the inner cannula 14 there is shown a rod 19 formed with a base 20 and having its outer end beveled as at 21 to stand flush with the beveled cutting edge of the inner cannula. To preserve a correct relation of rotation between the rod 19 and the cannula 14, the base 20 is shown as formed with a rib 21' entering a groove 22 in the face of the base 15.

The adapter base 11 is shown as provided with finger grip wings 23, 24 which may be formed as desired for engagement between the first and

second fingers of a hand with the thumb engaging the face of the member 25 of base 20. When so grasped, pressure exerted by the thumb will cause compression of the resilient connector 16 and thereby the cutting end of the inner cannula 14, closed by the rod 19 will be projected from cannula 10 for insertion of the latter through the skin into a vein, and upon release of the pressure of the thumb the cutting end of the inner cannula will be automatically retracted into the position shown in Figures 1 and 2.

The form of resilient member 16 is shown for purposes of illustration only. It is evident that a coiled metallic spring may be utilized if desired, covered with a non-resilient, flexible, fluid tight sleeve.

In operation the structure of Figure 1 may be applied to the vein as indicated above, whereupon the rod 19 may be withdrawn and the connector 26 carrying tubing 27 may be placed in lieu of the member 20 whereupon injection will proceed. Alternatively the structure as shown in Figure 2 may be utilized without the rod 19. In that case the thumb may be pressed upon the tubing 27 at the point 28 with the first and second fingers of the same hand hooked about members 23, 24 whereby the pressure exerted to project the cutting cannula will collapse the tubing, cutting off flow of liquid through the tubing until insertion is accomplished, when release of the grip will both permit retraction of the cannula 14 and initiation of flow of liquid into the vein.

In either use of the device of the invention no blood can escape backward through the needle while it is being inserted. If desired when the second described procedure is adopted the inner cannula may be allowed to fill with the liquid from tube 27 before pressure is applied at point 28, in order to keep the same from being stopped by a clot during insertion.

It will be seen that when the assembly of the inner cannula 14, the adapter member 11, the spring connector 16 and the adapter base 15, is removed by breaking of the joint 12, 13, the tapered portion 29 may be inserted into the socket 30 formed in the base of the outer cannula, in place of the tapered portion 31 and injection may proceed while the inner cannula 14 is being cleared of a stoppage.

To those skilled in the art the operation of the device in use will be obvious from an inspection of the drawing. When the structure of Figure 1 has been applied to the vein as indicated herein, and the pressure on the spring 16 released, the resultant retraction of the inner cannula 14 to

the position wherein its cutting edge 21 is completely housed in the outer cannula, will leave the chamfered edge of the end of the cannula 10 for contact with the interior of the vein. Thus the possibility of injury of the delicate vein tissue by movement of the cutting edge, by which the outer cannula was introduced, is avoided.

In use of the device for injections, the outer cannula may be in the vein for periods of twenty-four hours at a time. Many things may happen in this time. The inner cannula may become clogged and require removal for clearing while the fitting 26, 29 is applied to the outer cannula to avoid interruption of injection. During these manipulations the absence of a cutting edge on the resident outer cannula is of great value.

Minor changes may be made in the physical embodiment of the invention within the scope of the appended claims without departing from the spirit of the invention.

We claim:

1. A surgical needle comprising, in combination: an outer cannula having a base carrying one member of a readily detachable connection; an inner cannula carrying a second member of said connection and one member of a tube connector; said one members being alike whereby said joint may be separated and the remaining member of said tube connector may take the place

of said second member to place a tube into direct communication with said outer cannula.

2. The structure of claim 1 wherein one of said cannulae is formed with a piercing extremity.

3. The structure of claim 1 wherein the inner cannula is formed with a piercing extremity normally housed within the extremity of the outer cannula, and is slidable to cause said piercing extremity to project for insertion of the needle.

4. A surgical needle comprising, in combination: an outer cannula having one element of a detachable joint; an inner cannula assembly comprising, a member carrying a second element of said joint and formed with a through passage, a cannula slidable in said passage and said first-named cannula and formed with a piercing extremity and with a tube connection adapter, and a resilient member connecting said member and said slidable cannula urging the latter to a position with its piercing extremity concealed within said outer cannula.

5. The combination of claim 4 wherein the resilient connection between said member and said slidable cannula is fluid tight.

6. The combination of claim 4 with finger grip means carried by said member.

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