

June 18, 1946.

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2,402,306

RETAINING GUARD GUIDE FOR NEEDLES

Filed Oct. 7, 1943

2 Sheets-Sheet 1

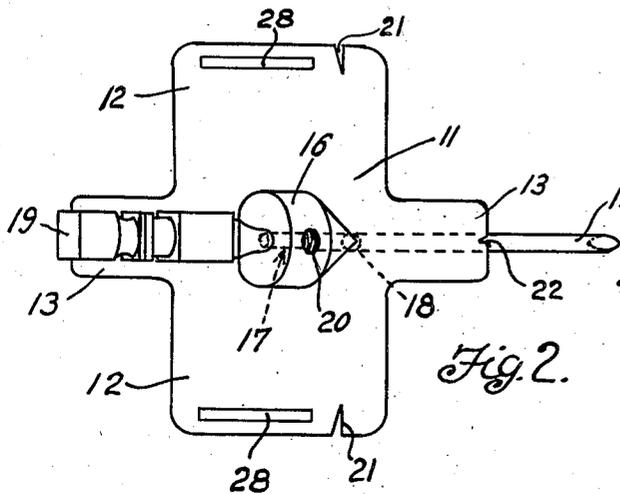


Fig. 2.

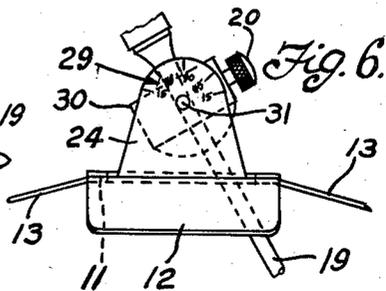


Fig. 6.

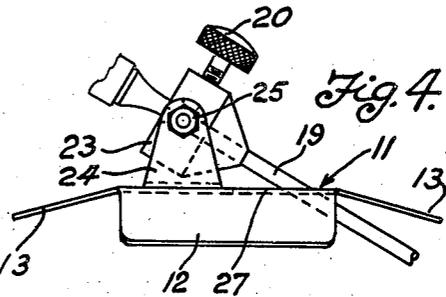


Fig. 4.

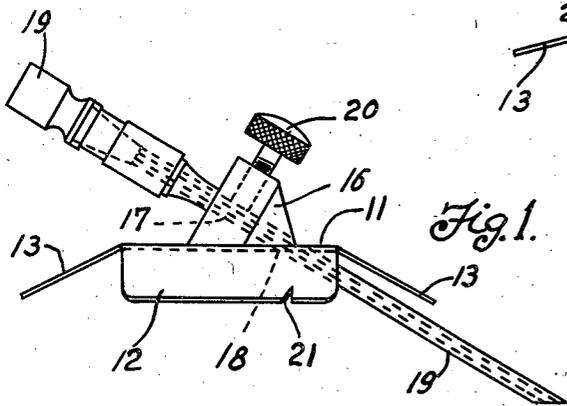


Fig. 1.

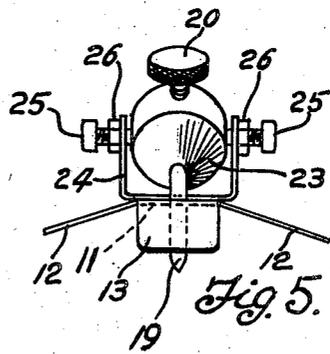


Fig. 5.

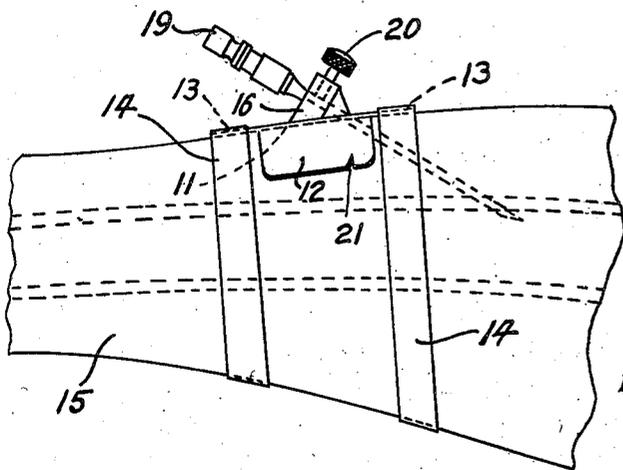


Fig. 3.

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2 Sheets-Sheet 2

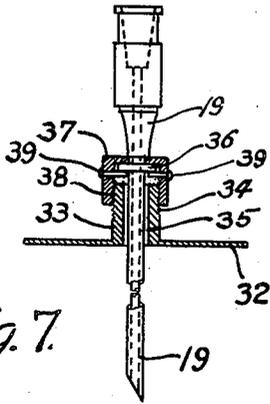


Fig. 7.

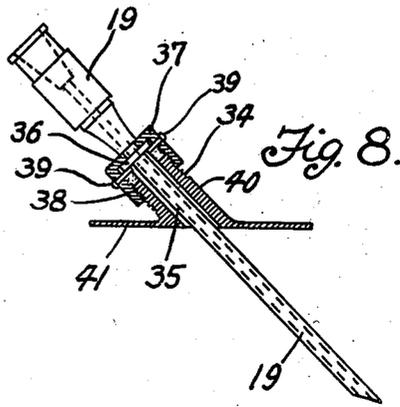


Fig. 8.

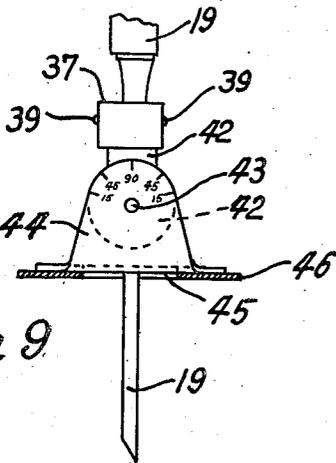


Fig. 9.

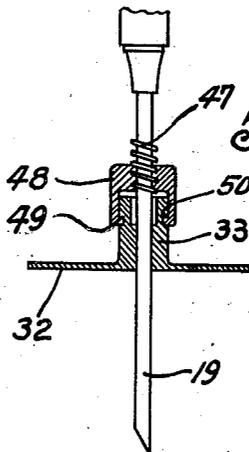


Fig. 10.

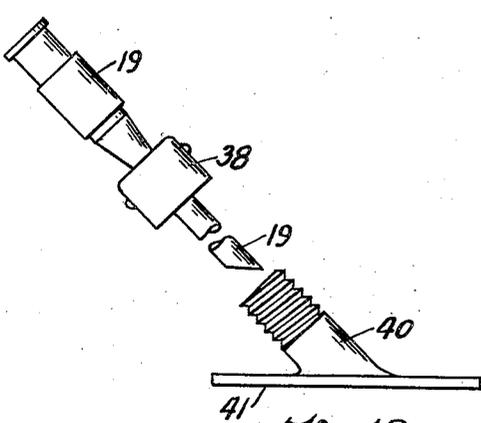


Fig. 12.

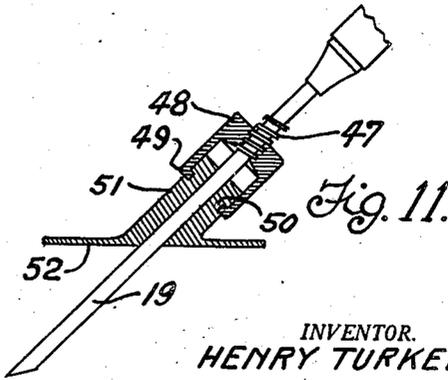


Fig. 11.

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UNITED STATES PATENT OFFICE

2,402,306

RETAINING GUARD GUIDE FOR NEEDLES

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Application October 7, 1943, Serial No. 505,407

1 Claim. (Cl. 128—215)

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This invention relates to a retaining guard guide for needles, and particularly for needles employed in performing biopsies, injections, or transfusions, irrigations, implantations, etc.

It is the object of the present invention to provide a guide means for the particular needle employed for governing the direction of movement and insertion of the needle within the tissue at the desired point.

It is the object of this invention to provide a retaining and guide means for the needle together with means for positively locating the point of entry of the needle, and for maintaining said guide means against movement from said point.

It is the further object herein to provide means for guidingly inserting the needle employed at a predetermined angle as desired, together with means for regulating said angularity.

It is the still further object of this invention to provide with said needle guide, guard means for fixedly securing the needle within its support after the insertion whereby the needle cannot be withdrawn, or inserted deeper than initially set, without further adjustment of said guard means.

It is the further object of this invention to provide supporting means sufficiently flexible or pliable to conform to the curvature or shape of the member or organ of the body to which it is to be attached, for performing the function of a needle retaining guard guide.

It is the further object of this invention to provide an angularly pivotal needle guide and support with calibrations for indicating the degree of angularity desired.

It is the further object herein to provide needle guide and retaining means together with manually operable means for progressively inserting or removing said needle from the tissue.

It is the further object of this invention to provide a supporting means adapted to be mounted upon the body of a patient, an angular needle guide means thereon, with a needle opening therethrough arranged at an acute angle to said support, and a needle adjustably positioned through said opening with its end having a bevelled portion with the angle thereof substantially equal to said acute angle.

It is the further object herein to provide pivotal needle guide and retaining means together with manually operable means for progressively inserting and removing the needle from the tissue.

These and other objects will be seen in the

accompanying specification, claim and drawings of which—

Fig. 1 is a side elevational view of the retaining guard guide.

Fig. 2 is a top plan view thereof.

Fig. 3 is a fragmentary side elevation of the needle and guide in operative position.

Fig. 4 is a fragmentary side elevational view of the guard guide with angle adjusting means.

Fig. 5 is a front elevational view of the same.

Fig. 6 is a fragmentary side elevational view of the guard guide with calibrated angle indicating means thereon.

Fig. 7 is an elevational sectional view of the needle guard guide with manually operable inserting means.

Fig. 8 is an elevational section of an angularly adjustable guard guide with manually operable needle inserting means.

Fig. 9 is a fragmentary partially sectioned elevational view of a calibrated pivoted guide with manually operable needle inserting means.

Fig. 10 is a fragmentary elevational section of the guard guide with a slightly different type of manually operable needle adjusting means.

Fig. 11 is a fragmentary sectioned elevational view of an angularly arranged needle guard guide with a different type of manually operable needle inserting means.

Fig. 12 is a further view of the modification of Figure 8 showing the needle in position prior to insertion in the guide member.

The above drawings illustrate preferable embodiments of the invention, by way of illustration, it being understood that other embodiments are contemplated within the scope of the invention hereafter set out.

In the drawings, the supporting member 11 is substantially flat at its central portion but with the oppositely disposed extending leaf members 12 adapted for angular bending to coincide with the shape of the body member to which the retaining guard guide is to be secured, as shown in Fig. 3.

Oppositely arranged retaining members 13 also projecting from and forming a part of said supporting member 11, provide securing means therefor as best shown in Figs. 2 and 3. Tape 14 or other suitable material transversely disposed over the top surface of members 13 and secured to the body member illustrated fragmentarily at 15 in Fig. 3, is adapted to maintain the needle support 11 firmly in the position desired.

The needle guide member 16 centrally secured to support 11 has an angularly disposed guide slot

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or opening 17 provisioned therethrough within which the needle 19 is guidingly inserted for a sliding fit. Said opening is preferably arranged at approximately a forty-five degree angle as shown in Fig. 1; however it is contemplated that the guide member itself be adapted for angular adjustment as shown in Figs. 4, 5 and 6.

The biopsy needle 19 shown herein by way of illustration is provisioned through opening 17 in guide 16, and also through a corresponding aligned opening 18 in support 11.

As shown in Figures 1, 3, 8 and 11, the outer pointed end of needle 19 is bevel pointed at an acute angle substantially equal to the angle guide opening 17 makes with support 12, upon which guide 16 is mounted.

It will be noted further that with the needle properly positioned, the bottom or bevelled edge of said needle lies in a plane substantially parallel to the flat portion of support 12.

As a safety feature in the insertion of the needle, as for instance in making infusions in the marrow portion of the bone in sternal infusions, by arranging the needle guide at an acute angle the bevel of the needle tip is nearly parallel to the inner surface of the "posterior lamella," which makes it practically impossible for the needle tip to be pushed through the "posterior lamella" and into the "anterior mediastinum."

One of the difficulties of intramedullary infusions has been the penetration of the needle into the tissues through the posterior boney wall of the lamella, by the use of "uncontrollable" force.

Where the ordinary needle with the right angular guide is employed, there is insufficient control over the needle and the degree and extent of its penetration. To eliminate this danger, inventor's angularly arranged guide is employed making it practically impossible to effect an excessive or dangerous penetration.

It is, therefore, important that the bevel angle at the cutting end of the needle be substantially equal to the angle of insertion of the needle into the patient; and further that said bevelled end lie in a plane substantially parallel to the corresponding outer surface of the body at the point of insertion.

Oppositely arranged slots 28 provisioned in members 12, as in Fig. 2, provide an alternate means of attachment through which gauze or other securing means may be disposed.

The guard means provided herein consists of a manually operable threaded stud 20 threadably journaled through guide 16 transversely to the opening 17 and the needle shaft 19 therein. The end of stud 20 is adapted to frictionally engage needle 19 for locking the same in any desired position within guide 16.

Thus it is seen that means are provided preventing relative movement of the needle 19 either in or out of guide 16. Consequently with the needle once properly inserted to the desired depth within the tissue a positive guarantee is effected that the needle will not accidentally or otherwise be displaced or moved relative to the support or to the tissue it engages.

Furthermore stud 20 is adapted to tightly hold the needle 19 in place during the desired operation, be it a biopsy, an injection or transfusion, or otherwise.

Indicating means 21 and 22 notched within members 12 and 13 respectively point to and coincide with the center point of opening 18 within support 11. Thus means are provided for ac-

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curately positioning opening 18 over the exact part or point on the body at which the biopsy or other operation is to take place.

In Figs. 4 and 5 the needle guide 23 for slidably supporting needle 19 is pivoted within the bifurcated stirrup 24 mounted and secured upon base member 11. A trunnion support is provided for guide 23 consisting of the co-axial oppositely arranged bolts 25, the inner ends of which are secured within said guide for pivotal angular movement therewith relative to stirrup 24.

Suitable manually operable lock nuts 26 are threaded upon bolts 25 for frictionally engaging the outer surfaces of member 24, whereby guide 23 may be locked in any desired adjusted position, as shown in Fig. 4.

Similarly a locking stud 20 is threaded transversely within guide 23 for frictional engagement with needle 19 slidably disposed there-through. Base 11 as in Fig. 4 is slotted at 27, corresponding to opening 18 shown in Fig. 1, for receiving the needle 19 in any desired acute angular position. It is understood that with guide means 23 being angularly adjustable it is necessary that opening 27 be slotted permitting such transverse movement.

Fig. 6 is similar to Fig. 4 except that the bifurcated supporting member 24 is provided with angle calibrations 29, as 15, 45 and 90 degrees, so that a given angularity of needle 19 may be determined. Needle guide 30 pivotally supported at 31 within support 24 is adapted to tilting movement as desired.

In Fig. 7, showing a slightly different embodiment, the needle guide guard consists of a support 32 with an upwardly extended hollow needle guide 33 exteriorly threaded at 34. Needle 19 slidably provisioned through opening 35, has an annular flange member 36 thereon adapted to be retained within the manually adjustable member 37, which is interiorly threaded at 38 for cooperative threaded engagement with the needle guide 33. Needle flange 36 is further retained at its under surface by pins 39 transversely disposed through member 37.

Consequently rotary movement of member 37 will cause translation of needle 19 within needle guide 33 and support 32. It is noted that flange 36 provides effective means for retaining needle 19 in any desired adjusted position.

In Fig. 8, showing a slightly different embodiment, the needle guide guard consists of a support 41 with an upwardly extending hollow needle guide 40 disposed at an acute angle and exteriorly threaded at 34. Needle 19 slidably positioned through opening 35, has an annular flange member 36 thereon adapted to be retained within the manually adjustable member 37, which is interiorly threaded at 38 for cooperative threaded engagement with the needle guide 40. Needle flange 36 is further retained at its under surface by pins 39 transversely disposed through member 37.

Consequently rotary movement of member 37 will cause translation of needle 19 within needle guide 40 and support 41. It is noted that flange 36 provides effective means for retaining needle 19 in any desired adjusted position.

It will also be noted that the bevel angle at the end of needle 19 is substantially equal to the angle guide opening 35 makes with guide support 41. And furthermore, it is seen that the bevelled end of said needle lies in a plane substantially parallel to the plane of support 41.

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Fig. 9 is similar to Fig. 7 with the exception that the needle guide 42 is pivotally supported at 43 within the bifurcated support 44. Needle 19 disposed through pivotal guide 42 and slot 45 in support 46, is similarly provided with an annular flange as shown in Fig. 7. Said flange is also retained within the manually operable adjusting member 37 by means of the transverse pins 39 provisioned thereunder.

As in Fig. 7, guide 42 is exteriorly threaded for cooperative threaded engagement with the interior threads within adjusting member 37. Consequently, regardless of the angular position of guide 42, needle 19 may be longitudinally adjusted therein by means of rotatable member 37.

In Fig. 10 the guide guard consists of a support 32 and upwardly extending hollow needle receiving guide 33 as in Fig. 7. Needle 19 provisioned through said guide and support is adjustably retained therein by means of the threads 47 forming a part of needle 19.

The manually adjustable member 48 interiorly threaded for cooperative threaded engagement with needle threads 47, is slidably supported by means of its inwardly extending annular flange 49 rotatably received within a complementary annular recess 50 within guide 33.

Thus on rotational movement of member 48, needle 19 may be adjusted longitudinally within its guide 33, it being understood that needle 19 is itself retained against rotational movement, either manually, or by frictional engagement with the tissue.

In Fig. 11, the guide guard consists of a support 52 and outwardly extending hollow needle receiving guide 51 disposed at an acute angle. Needle 19 positioned through said guide and sup-

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port is adjustably retained therein by means of the threads 47 forming a part of needle 19.

The manually adjustable member 48 interiorly threaded for cooperative threaded engagement with needle threads 47, is slidably supported by means of its inwardly extending annular flange 49 rotatably received within a complimentary annular recess 50 within guide 51. Thus on rotational movement of member 48, needle 19 may be adjusted longitudinally within its guide 51, it being understood that needle 19 is itself retained against rotational movement either manually, or by frictional engagement with the tissue.

It will also be noted that the bevel angle at the end of the needle 19 is substantially equal to the angle the guide opening in guide 51 makes with support 52; furthermore, it is seen that the bevelled end of said needle lies in a plane substantially parallel to the plane of support 52.

Having described my invention, reference should now be had to the claim which follows for determining the scope thereof.

I claim:

A needle retaining guide guard comprising supporting means, guide means thereon with an opening therethrough arranged at an acute angle to said supporting means, a needle positioned through said guide means and having a bevelled end with its bevel angle substantially equal to said acute angle, annularly flanged means on said needle, and rotative operative means engaging and retaining said flanged means and threadably engaging said guide means for effecting longitudinal adjustments of said needle relative to said guide means.

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