

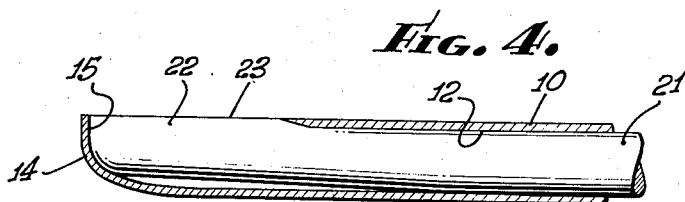
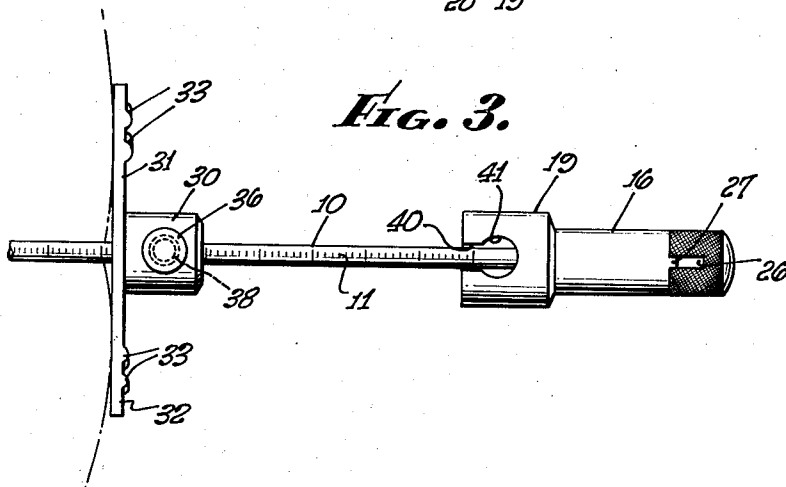
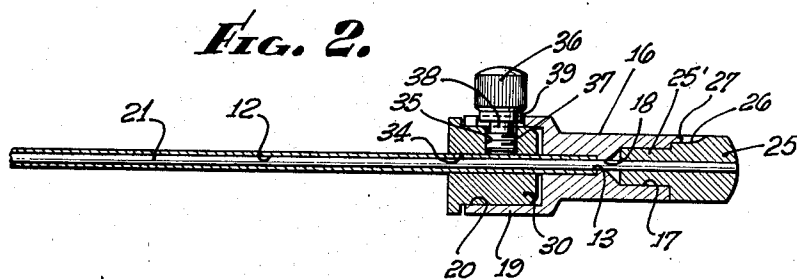
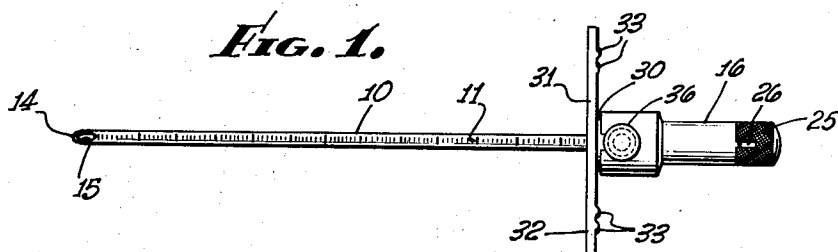
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T. J. MEADER ET AL

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EPIDURAL NEEDLE

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INVENTORS.
T. JOHN MEADER,
AARON BLOOM,
BY
Cornelius D. Bechler

ATTORNEY.

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EPIDURAL NEEDLE

T. John Meader, Azusa, and Aaron Bloom, Pasadena, Calif., assignors to Sierra Engineering Co., Sierra Madre, Calif., a corporation of California

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The invention relates to surgical instruments and has particular reference to instruments used for the purpose of administering anesthetics to what is known as the epidural cavity in the spine. The invention is an improvement upon co-pending application Serial No. 699,842, filed November 29, 1957.

For a considerable number of years surgical technique has employed an anesthetic procedure commonly termed a spinal block. To administer anesthetic in accordance with this technique the accepted practice has been to puncture the spine through to the spinal column and there extract a small portion of the spinal fluid, mix it with a very carefully measured amount of selected anesthetic, and reinject the mixture into the spinal column. While this technique has been a tremendous benefit in surgical operations because of the fact that it is capable of anesthetizing portions only of the lower section of the body where surgery is to take place without the necessity of rendering the patient unconscious, the technique has been such a delicate one that extreme care has been necessary. This is partly for the reason that if slightly too much anesthetic fluid is injected into the spinal column, it may cause uncomfortable and even serious after-effects and in fact in some instances may even cause death.

Subsequently there was developed an anesthesia technique known as epidural anesthesia. This technique makes use of a space surrounding the spinal cord but separate from the spinal cord. Administration of anesthesia into this portion of the spine has material advantages in that the amount of anesthetic fluid need not be calculated to such a fine degree. Also the epidural anesthetic technique has been found to be one virtually free from troublesome and uncomfortable after-effects. Moreover, because the epidural cavity extends to a location well below the brain, the prospect of an occasional death resulting from exercise of the technique is virtually minimized.

Although these very marked advantages in employment of epidural anesthesia have been recognized for a considerable time, this technique has not been widely employed because of a lack of adequate instruments. If epidural anesthesia is to be used, extreme care must be taken not to penetrate into the spinal cord. Where sharp needles have been used, and this has been the customary procedure up to this time, only by the most skillful handling can the technician avoid an inadvertent penetration past the epidural cavity and into the spinal cord. In fact the epidural cavity is such a relatively small space that it can be located by use of instruments heretofore available only with exercise of the most extreme care. Obviously, should the spinal cord be inadvertently pierced and a quantity of anesthetic administered on the assumption that it would be reaching only the epidural cavity, extremely serious consequences would unquestionably result. Hence, for lack of proper instruments this highly

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desirable and advantageous anesthetic technique has not been practiced.

Although the needle of the co-pending application hereinabove referred to has had a very remarkable success, it has been found that because the needle must be provided with a very blunt point and that blunt point driven through many layers of muscle and tissue, the anesthetist must be capable of grasping the instrument with a great deal more firmness than is usually necessary in the administration of anesthetics through a needle. Since there is a practical limit to the diameter of the needle which is permissible, means should be provided to assure a firm grip on the needle without such means being the cause of collapsing or warping the needle, thereby to impair both its current and future use.

It is therefore among the objects of the invention to provide a new and improved epidural needle which is capable of providing a firm, non-sliding attachment of finger manipulated flanges to the needle assembly without having to resort to any substantial change in the needle assembly construction nor to resort to a needle of unnecessarily heavy proportions.

Another object of the invention is to provide a new and improved epidural needle which permits a finger-grasping flange to be anchored to the needle assembly without prospect of separation during initial stages of the operation and in a manner such that there can be no damage to the wall of the needle shaft or the passage therethrough.

Still another object of the invention is to provide a new and improved epidural needle wherein gripping means can be firmly anchored to the needle assembly during initial stages of the operation under circumstances where the same gripping means can be quickly and easily released for adjustment in a different position at some subsequent phase of the injection, the device being such that it requires very little change in the needle assembly heretofore employed and wherein such change is productive of no appreciable additional cost in fabrication.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims and illustrated in the accompanying drawings.

In the drawings:

Figure 1 is an elevational view of the needle assembly with parts connected together in the arrangement they would have during initial stages of penetration.

Figure 2 is a longitudinal sectional view slightly foreshortened showing the interior parts of the needle assembly.

Figure 3 is an elevational view of the needle assembly with principal parts in a different position of adjustment such as would prevail after penetration and prior to the administration of the anesthetic fluid.

Figure 4 is a fragmentary longitudinal sectional view of the blunt point of the needle.

In an embodiment of the invention chosen for the purpose of illustration there is shown a needle shaft 10 on the exterior of which may be provided linear graduations 11. A central passage 12 extends throughout the entire length of the needle, the central passage having an open end 13. At the end of the needle opposite from said open end is a rounded blunt point 14, at one side of which is a lateral opening 15.

A member herein designated a bushing 16 surrounds the end of the needle shaft adjacent the open end 13 and has an axial opening therethrough with the needle shaft

permanently affixed therein. At the outside end of the bushing is an outwardly open pocket 17 having a hole 18 at the bottom communicating with the open end 13 of the needle shaft. At the opposite end of the bushing is an enlargement 19 at the center of which is an end open recess 20.

A rod 21 extends through the central passage 12 and is provided with a head 22 having one flat side 23 which is adapted to be spring pressed into a position filling the lateral opening 15 when the rod is in place. A knob 25 affixed to the rod enables manipulation of the rod into and out of the hollow needle. A boss 25' on the knob has a releasable snug fit in the pocket 17 and a notch 26 which coincides with a projection 27 in order that the operator may accurately locate the position of the head 22 when the rod 21 is inserted.

A second member herein designated as a collar 30 has a cylindrical form and a diameter on the exterior such that it slides freely into the recess 20. On the collar at one end is a pair of flanges 31 and 32 provided with elevations 33 to assist the operator in grasping the flanges with his thumbs and forefingers during use. The collar has an axial opening therethrough herein designated as a bore 34 enabling the collar to slide freely along the length of the shaft 10. On one side of the collar is a threaded opening 35 which communicates between the exterior and the bore 34. A thumb screw 36 is provided with a threaded portion 37 threadably received in the threaded opening. Adjacent the threaded portion of the thumb screw is a neck 38 and immediately adjacent the neck is a shoulder 39.

From an examination particularly of Figure 3 it will be found that the enlargement 19 is provided with an end opening slot 40 which has a width slightly greater than the diameter of the neck 38 and appreciably smaller than the diameter of the shoulder 39. An enlargement 41 at the inside end of the slot has a diameter very slightly greater than the diameter of the shoulder 39.

In use during initial stages of the penetrating operation the thumb screw is first released sufficient to permit the collar to slide freely along the shaft 10. At this point the collar is slid into the recess 20 and this sliding is permitted by reason of the fact that the neck 38 can slide freely through the slot 40. When the collar is completely received within the recess 20, the thumb screw is threaded into the collar until the innermost end engages the shaft. Movement in this direction is sufficient to move the shoulder 39 into the enlargement 41. Consequently the collar is firmly secured within the bushing and when the flanges 31 and 32 are pressed in a direction toward the blunt end of the needle and accordingly toward the body of the patient to whom the needle is administered, the thrust is transferred through the collar to the thumb screw and thence to the enlargement and the bushing and ultimately to the shaft 10. Accordingly there is provided a firm connection which is necessary to permit the firm thrust needed during initial penetration of the very blunt point of the needle into the body.

After the initial penetration has been accomplished, the thumb screw 36 can be loosened or released and unthreaded outwardly far enough to have the shoulder 38 moved to a position outside of the enlargement 41. Thereupon the collar can be slid out of the recess 20 as the neck 38 slides outwardly through the slot 40. After the thrust has been released upon the needle and it stays in the desired position, the collar can be moved toward the body of the patient until the flanges touch the exterior and there tightened upon the shaft 10 to mark the extent of penetration in the first instance in the event it might be necessary for some reason to remove the needle for reinsertion at a later time.

There has accordingly been described herein a special tightening means for the collar upon the bushing of an epidural needle in such fashion that a simple thumb screw can be employed to firmly anchor the collar to the bush-

ing, thereby making it unnecessary to employ a needle shaft with walls so thick that the shaft would not collapse as a result of undue pressure brought by the thumb screw.

While we have herein shown and described our invention in what we have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of our invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. An anesthetic device comprising a hollow needle shaft having a central passage therein opening in an axial direction at the outer end, a member fixed to the outer end of the needle shaft having an axial opening therethrough and having said needle shaft received in said opening, another member having an axial opening therethrough slidably mounted on the shaft, flange means on said other member, one of said members having a recess therein and the other of said members having a portion receivable in said recess, said portion having a threaded opening communicating with the axial opening therein, a thumb screw having a threaded end threadedly engaging said threaded opening, a narrow neck adjacent said threaded end and a cylindrical shoulder of diameter greater than the neck adjacent said neck, the member with the recess having an end open slot in communication with said recess and of width smaller than the diameter of said shoulder, said slot being adapted to slidably receive said neck when the thumb screw is in released position, and an enlargement at the inside end of said slot larger in diameter than said shoulder and adapted to receive said shoulder when the thumb screw is in set position whereby to anchor said members together.

2. An anesthetic device comprising a hollow needle shaft having a central passage therein opening in an axial direction at the outer end, a bushing fixed to the outer end of the needle shaft and having an outwardly open aperture communicating with said central passage, means forming a recess in said bushing surrounding said shaft, a collar having a bore therethrough slidably mounted on the shaft, flange means on the collar, a portion of said collar being receivable in said recess, means forming a threaded opening in said collar communicating with said bore, a thumb screw having a threaded end threadedly engaging said threaded opening, a narrow neck adjacent said threaded end and a cylindrical shoulder of diameter greater than the neck adjacent said neck, said bushing having an end open slot in communication with said recess and of width smaller than the diameter of said shoulder, said slot being adapted to slidably receive said neck when the thumb screw is in released position, and an enlargement at the inside end of said slot larger in diameter than said shoulder and adapted to receive said shoulder when the thumb screw is in set position whereby to anchor said collar to the bushing.

3. An anesthetic device comprising a hollow needle shaft having a central passage therein opening in an axial direction at the outer end, a rounded blunt point at the inner end and a lateral opening adjacent said blunt point, a bushing fixed to the outer end of the needle shaft and having an outwardly open pocket communicating with said central passage, an enlargement on the bushing on the end thereof opposite said pocket and means forming a recess in said enlargement surrounding said shaft, a collar having a bore therethrough slidably mounted on the shaft, laterally extending flanges at one end of the collar, the other end of said collar being receivable in said recess, means forming a threaded opening in said collar communicating with said bore, a thumb screw having a threaded end threadedly engaging said threaded opening, a narrow neck adjacent said threaded end and a cylindrical shoulder of diameter greater than the neck adjacent said neck, said enlargement having an end open slot in com-

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munication with the recess and of width smaller than the diameter of said shoulder, said slot being adapted to slidably receive said neck when the thumb screw is in released position, and an enlargement at the inside end of said slot larger in diameter than said shoulder and adapted to receive said shoulder when the thumb screw is in set position whereby to anchor said collar to the bushing.

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