Feb. 9, 1932. R. J. LOWRIE 1,844,364

NEEDLE

Filed Jan. 12, 1931

Fig. 1.

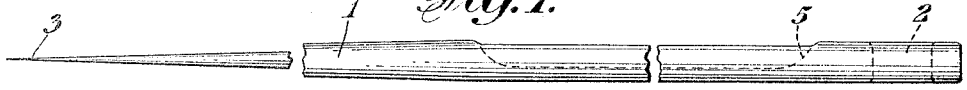


Fig. 2.



Fig. 3.



Fig. 4.

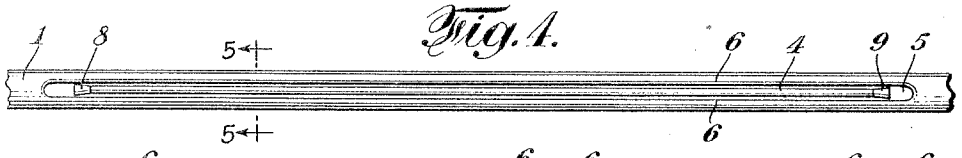


Fig. 5.

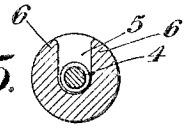


Fig. 8.

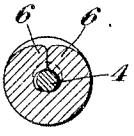


Fig. 9.

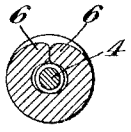


Fig. 6.

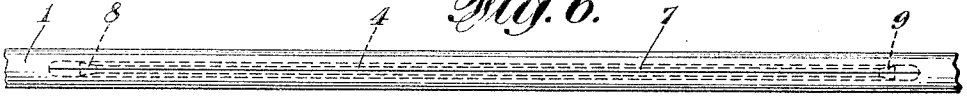


Fig. 7.



Fig. 10.

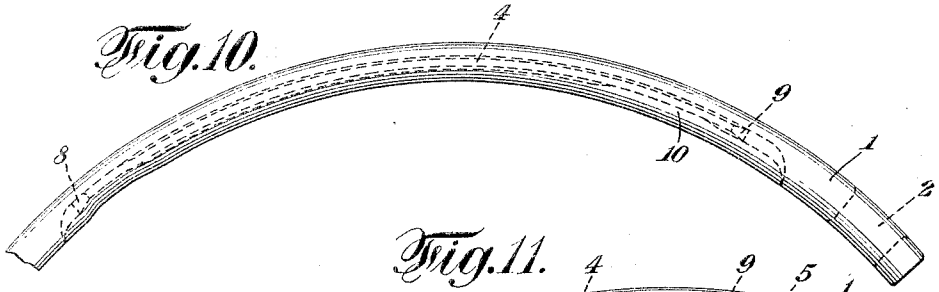
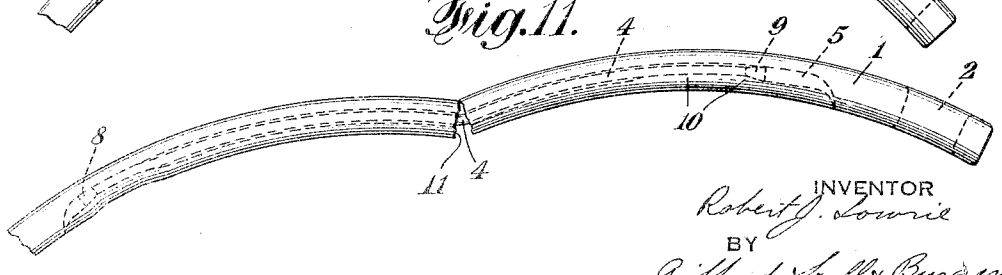


Fig. 11.



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UNITED STATES PATENT OFFICE

ROBERT J. LOWRIE, OF NEW YORK, N. Y.

NEEDLE

Application filed January 12, 1931. Serial No. 508,131.

This invention relates to a novel and improved form of needle, the novel features of which will be best understood from the following description and the annexed drawings, in which I have shown a selected embodiment of the invention, and in which:

Fig. 1 is a longitudinal view of a needle body and illustrating the initial step in making the invention.

Fig. 2 is a top view of the structure shown in Fig. 1.

Fig. 3 is a view of the core to which reference will be made later.

Fig. 4 is a fragmentary view of the needle body showing the core in place in the slot in the body.

Fig. 5 is a section on the line 5—5 of Fig. 4.

Fig. 6 is a view corresponding to Fig. 4, but showing a later step in the manufacture of the needle.

Fig. 7 is a longitudinal elevation of the structure appearing in Fig. 6.

Figs. 8 and 9 are sections on the lines 8—8 and 9—9 of Fig. 7.

Fig. 10 is a fragmentary view of a needle constructed according to my invention, and bent to a curvature such as is commonly used in connection with surgical needles.

Fig. 11 is a view corresponding to Fig. 10, but illustrating what will normally happen when the structure of Fig. 10 breaks.

Referring first to Figs. 1 and 2, I have shown therein a needle having a body 1 which may be provided with an eye 2 and which, of course, has the usual point 3. I shall describe the invention as applied to a surgical needle with which it finds particular utility, although the invention may be practiced with other kinds of needles, such as a hypodermic needle, a lumbar puncture needle, or a sewing needle.

With surgical needles in particular, and also with other needles, it is not unusual for the needle to break while in use. This is particularly disadvantageous and even dangerous where the needle is used in connection with a surgical operation, because normally the break takes place adjacent the point where it is inserted into the flesh, skin, or other tissue of the patient. This is true, because in the normal operation of sewing up a wound, a needle is inserted into what for simplicity will be termed the tissue of the patient, and then it is used as a lever with the fulcrum on the tissue at the point where the needle enters it. This is necessary, because the needle is used not only to merely pierce the tissue, but to draw it together, and, therefore, the needle has to be used not only as a piercing instrument, but also as a lever, and so has to take a lateral stress tending to bend or break it.

It is, of course, well known that a needle is made of relatively high carbon or other steel which will take the fine point which is needed, and therefore the steel is often not capable of taking the bending stress to which it is subjected during an operation. I have overcome this difficulty by providing within the body of the needle a longitudinally extending reinforcement which for convenience I shall call a core, and which may be in the form of a wire or in any other suitable form. This core is of flexible and relatively tough material as compared to the material of the needle, and therefore if the needle breaks, the core will hold the parts together, so that the part which may be embedded in the wound may be withdrawn quickly and easily. Of course, it is well known that many operations have to be performed quickly, and the time taken to retrieve the point of a broken needle might make the difference between success or failure of the operation.

Referring again to the drawings, Fig. 3 shows one form of the core 4. In this form, it is indicated as a cylindrical wire which is placed in a longitudinally extending slot 5, this slot being exemplary of any suitable bore or recess which may be formed in the needle body and which extends lengthwise thereof. In Fig. 4 is shown the core as it will appear in place in the recess.

After the core is placed in the recess, it may be secured therein as by bending over the walls 6 of the recess until they meet, as shown in Figs. 6, 8, and 9. When they thus meet, the meeting edges form a longitudinally extending seam 7, as best shown in Fig. 6, the edges of the walls being preferably cham-

fered as shown, to insure a good joint between the walls.

It will be seen that each end of the core is provided with enlarged portions 8 and 9 and, as best shown in Fig. 7, it will be seen that the metal of the walls 6 is forced into tight engagement with the core or end 8 and substantially into engagement with the core at a point 10 spaced from the ends 9. This engagement at the point 10 is a sliding one, the object of which will be explained presently, but the end 8 is rigidly held against movement in either direction.

In Fig. 10, I have shown the needle body as being bent to some such curve as is common in surgical needles, and it will be seen that even after curving, the end 9 is spaced from the point 10, so that the core 4 may still move longitudinally of the recess.

In Fig. 11 is shown a typical break of the needle at 10, and it will be seen that the end 8 remains fixed in position, whereas the end 9 may slide lengthwise of the recess 5 until it engages the walls of the recess at 10. It is to be understood that the point 10 is merely a constricted portion of the recess of sufficient extent so that the end 9 cannot pass it, and while for the sake of simplicity I shall refer in the claims to an engagement between the walls of the recess and the core, it is supposed to be understood that there need not be actual engagement, although normally there will be.

It will thus be seen that when a needle breaks at some such point as shown at 11, the end having the point will be retained by the core 4, which may bend more than the body of the needle, without breaking. Then the surgeon may quickly withdraw the point from the wound. The limited longitudinal movement of the core relative to the body of the needle permits bending of the core at the break on a large radius instead of on a short radius as would be the case if the core were held rigidly in the needle body throughout its length. This relieves the core of stress at the point where the break takes place, and thus minimizes the possibilities of its breaking at this point, either when the initial break takes place or during removal of the point from the wound.

While I have shown the invention as embodied in a specific form, it is to be understood that various changes in details may be made without departing from the scope of the invention, and I therefore do not intend to limit myself except by the appended claims.

I claim:

1. A needle comprising a body having a reinforcing core extending lengthwise thereof and embedded therein, means securing one end of said core to said body and permitting longitudinal movement of the other end within the body, and means limiting said longitudinal movement.

2. A needle comprising a body having a longitudinally extending recess therein, a core disposed in said recess and of smaller size than the recess, the walls of the recess engaging one end of the core to prevent longitudinal movement of that end and engaging the core adjacent the other end, said other end being enlarged to prevent its movement past the point where the walls engage the core.

3. A needle having a body formed with a longitudinally extending slot, a core disposed in said slot, the walls of the slot being formed inwardly to prevent removal of the core from the slot, means securing one end of said core to said body and permitting longitudinal movement of the other end within the body, and means limiting said longitudinal movement.

4. A needle having a body formed with a longitudinally extending slot, a core disposed in said slot, the walls of the slot being formed inwardly to prevent removal of the core from the slot, the ends of said core being enlarged, and the walls of the slot being pressed into firm engagement with one of said enlarged ends and into engagement with the core adjacent the other enlarged end for the purpose set forth.

5. A needle having a body formed with a longitudinally extending slot, and a core disposed in said slot, the walls of the slot being formed inwardly to prevent removal of the core from the slot, the edges of the walls contacting with each other to form a longitudially extending seam.

ROBERT J. LOWRIE.