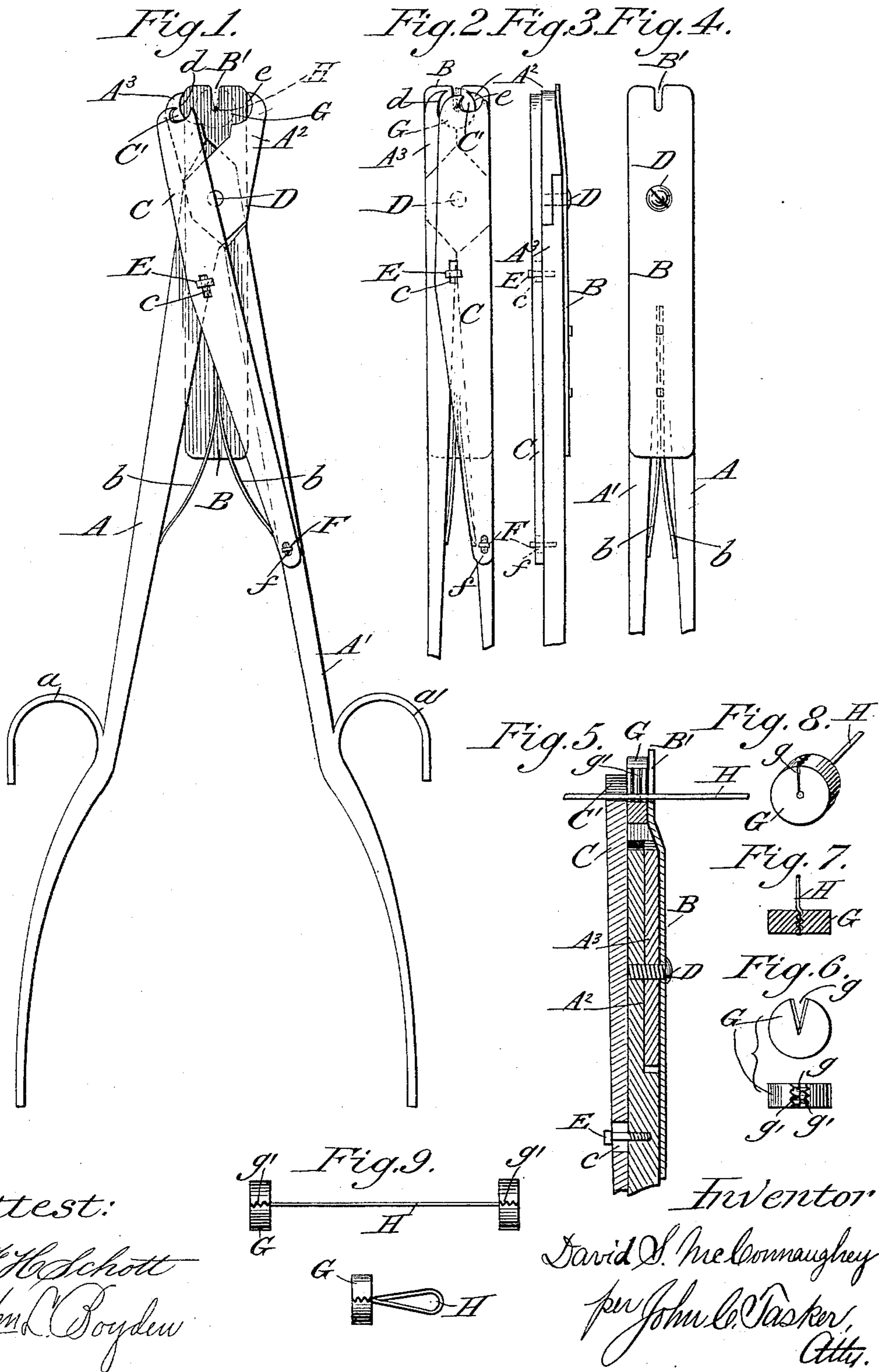


(No Model.)

D. S. McCONNAUGHEY.  
SUTURE INSTRUMENT.

No. 462,270.

Patented Nov. 3, 1891.



# UNITED STATES PATENT OFFICE.

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## SUTURE-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 462,270, dated November 3, 1891.

Application filed March 30, 1891. Serial No. 387,004. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID S. McCONNAUGHEY, a citizen of the United States, residing at Washington, in the county of Washington and State of Iowa, have invented certain new and useful Improvements in Suture-Instruments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in suture-instruments, the object of the invention being to provide a simple, cheap, and efficient surgical device for use in surgical operations in holding in apposition the edges of an incision or the surface of wounded parts or lacerations; and the invention consists, essentially, in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and claimed.

In the annexed drawings, illustrating my invention, Figure 1 is a plan view of my improved suture-instrument, the forcep-jaws being open. Fig. 2 is a similar partial plan view with the forcep-handles broken off and the jaws closed to hold one of the suturing-disks. Fig. 3 is an edge view of the device shown in Fig. 2. Fig. 4 is a reverse plan of the device shown in Fig. 2. Fig. 5 is an enlarged partial longitudinal section. Fig. 6 is a plan and edge view of one of the suturing-disks. Fig. 7 is a cross-section of one of the suturing-disks after the cut therein has been closed by pressure for the purpose of connecting the disk securely to the end of a piece of wire. Fig. 8 is a perspective view of one of the disks and the wire connected thereto, said disk having its cut or slot closed and the periphery made substantially complete. Fig. 9 is a view showing a piece of wire with a suturing-disk securely connected to each end thereof, and representing also a looped piece of wire having both its ends connected to the same disk.

Similar letters of reference designate corresponding parts throughout all the different figures of the drawings.

In the construction of my improved suture-instrument I first provide a pair of forceps whose purpose it is to receive between their jaws a leaden or other soft-metal disk having

a peripheral notch or cut, into which the ends of the silver or other wire are laid, and then by manipulating the forceps said disk is pressed or squeezed so that it may tightly engage the wire or wires and be firmly connected thereto. A common and well-known method of closing sutures by a ligature in cases of cleft palate, recto-vaginal, and vesico-vaginal fistula cases is to take a thread, pass it through the sides of the incision, and then bring the two ends together and enter them through an aperture in a shot, which is seized by forceps pushed up to the ligature, so as to bring the inside edges into apposition, after which the shot is squeezed flat so as to securely hold the suture. The bullet-suture is often employed, and likewise the button and quill suture are used. Staphyloraphic instruments and uraniscoplastic instruments are often employed for operations upon the palate, the edges of the cleft being pared, ligatures passed through them, after which they are brought together by the use of these instruments. My invention aims, however, to provide a much simpler, cheaper, and better instrument than has heretofore been used for the purpose of a suture-instrument, particularly when silver or other wire is employed for holding in apposition the edges of the incision. I simply refer to these other methods and instruments to indicate briefly an idea of some of the other modes and devices now in use.

The forceps which I employ have the handles A A', which are of the proper length or shape and are preferably provided, respectively, with the finger-loops *a* and *a'*. These handles are pivoted together by means of the pivot D.

A<sup>3</sup> designates one of the forcep-jaws, which is formed on the end of the handle A' beyond the pivot, and A<sup>2</sup> designates the other forcep-jaw, formed on the end of the other handle A beyond the pivot D. The opposing inner edges of the jaws A<sup>3</sup> and A<sup>2</sup> are provided, respectively, with curved recesses *d* and *e*. These recesses are adapted to receive within them and between the jaws a suitable disk which can be tightly compressed within the recesses when the handles of the forceps are pressed together.

B designates a strip of thin spring-steel or

other metal or material, serving as a shield or backing-plate, it being held in place by means of the screw-pivot D, which, we have seen, connects the forcep-jaws. The metallic strip B is provided with a pair of oppositely-projecting flat steel or other springs *bb*, which lie between the forcep-handles A A' and in contact therewith, said springs *bb* being fastened on the center longitudinal line of the strip B, and said springs operate to keep the strip B exactly in a central position at all times, whether the jaws of the forceps are opened or closed, in order that a central slot, slit, opening, or notch B' in the outer end of the shield B may be kept at a point midway between the opposing recesses *d* and *e*, so that a wire within said slot B', resting in the lower end thereof, may be kept also within a cut in the suturing-disk which occupies a position within the jaws.

The shield also serves another very necessary purpose—that of preventing any part of the tissues of the adjoining incision with which the instrument may at any time be used from falling between the blades of the instrument.

On the side of the forceps opposite to where the shield B is located is a third blade or jaw C, which has several uses. Its lower end is provided with a slot *f*, through which passes a headed pin F, fixed in the forcep-handle A'.

The blade C is also furnished with a slot *c* long enough to permit of a certain amount of oscillation or play, which slot contains a headed pin E, fixed in the forcep-handle A at a point not far from the forcep-pivot D.

Therefore the outer end of the blade C is contiguous to the jaws A<sup>2</sup> and A<sup>3</sup>, and as the forcep-handles are manipulated and the forcep-jaws in consequence move toward or away from each other the end of the blade or arm C will likewise have a movement analogous to the backward-and-forward movement of the jaw A<sup>3</sup>, but being pivoted at a point below the pivot D the end of the blade C will, when the two jaws A<sup>3</sup> and A<sup>2</sup> approach each other, have a cross or shearing movement which will carry it not only across the face of jaw A<sup>3</sup>, but also over to the jaw A<sup>2</sup>. In other words, it will have a shearing movement across the space between the two jaws and accordingly across the face of the disk contained between said jaws. The end of this blade C is provided with a curved slot C', the edge of which is sharpened to provide a cutter. It may therefore be proper to enumerate the use of the blade C and its cutter C' as being three in number. First. To hold the suturing-disk between the jaws A<sup>3</sup> and A<sup>2</sup>. It will of course be observed that when a disk has been located between these jaws and the jaws have begun to move toward each other said disks will be confined between the jaws A<sup>3</sup> and A<sup>2</sup>, the slitted end of the shield B, and the blade end C' of the arm C, and hence the disk cannot escape, but must be squeezed and pressed tightly within its confined limits. Secondly. The object of the cutter-provided arm is to form a groove or guide for the end of the wire when it is being

drawn or when the disk is being placed in position, the end of the wire obviously passing through the curved recesses C'. Thirdly. The blade C has the function of cutting, by means of cutter C', the wire projecting on the surface of the disk. As the disk is being squeezed and tightly pressed upon the wire passing through it, cutter C' will simultaneously operate to clip off or cut off the projecting end of the wire close up against the face of the disk, so that there will be no troublesome projecting end of the wire, and by one simple squeezing movement not only will a perfect compression of the disk be effected, but its upper surface will be left smooth and neat. The blade C can be readily disconnected from the other parts whenever the pivot D has been removed for the purpose of disengaging the two parts of the forceps, since the elongated slots *f* and *c* will readily permit the blade, when properly turned, to be removed from the headed pins F and E. Furthermore, it will be observed that the jaws A<sup>3</sup> and A<sup>2</sup> are made of the same thickness as the disks which are to be placed between them; also, that the slot B' in the end of the shield B will be of suitable depth and width to properly permit the wire to pass through, and also that the several parts will have their shapes, size, and relative adjustment so fixed and complete that the movements to which I have already referred in the description will take place successfully so as to accomplish perfectly the purposes for which they are severally and jointly intended; and, also, it will be noted that the blade C forms a connection between the two arms A and A', since the pin E is fixed in the arm or handle A and the pin F is fixed in the arm or handle A'. Therefore the handles of the forceps can be opened only just so far, the blade C preventing any further movement after the limit has been reached. Other modes of pivotally connecting the handles than by the use of the pivot D may be employed. These handles may be constructed in any suitable manner to suit the convenience or taste of the user. They may be straight or at an angle with the jaws, or they may be the ordinary shears or scissors handle, or any other kind of handle.

G represents one of the suturing-disks and H a piece of silver or other wire to which my instrument is designed to connect the disk. The disk G is made of any suitable soft metal or material, such as lead. It is provided with a V-shaped cut extending inward from the periphery to the center and a little past the center. The inner opposing edges of the cut *g* are provided with longitudinal grooves or corrugations *g'*.

The disks G are flat and preferably equal in thickness to about the thickness of the jaws of the forceps. It will be readily seen that one of the disks G can by the compressing action of the forceps be compressed or squeezed together, so as to entirely close the cut *g* and cause the corrugations or grooves to embed

themselves in each other, making the disk firm, complete, and tight. The end of the wire may be laid within the cut *g*, so as to occupy a position at the central point of the disk *G*. Then after the compression takes place on the wire, said wire will be rigidly connected to the disk at a central point.

In Fig. 5 I have shown a longitudinal section, on an enlarged scale, of the working parts of the device, the wire *H* occupying a position within the slit *B'* within the bottom end of the disk-cut *g*, and also within the cutter-guide *C'*. A quick movement now of the hand in compressing the handles of the forceps will compress the disk, engaging the wire therewith and cutting off the projecting end of the latter, so as to leave a smooth outside surface on the disk. In this way the wires after they have been passed through the edges of an incision and said edges have been brought into close apposition may be tightly connected to one of these disks in the manner shown in Fig. 9, where two ends of a wire are shown connected to a disk, or where a disk is shown connected to each end of a piece of wire. The disks may be connected to the wires in any manner that it may be desired to have them, and connection will be quickly accomplished and will be found perfect and durable.

In Fig. 7 the form of the wire itself within the disk after the latter has been tightly compressed is represented, it being obvious that as the wire is compressed between the two corrugated edges it will itself be corrugated or ridged, and therefore the provision of the corrugated edges of the cut assists in making the connection of the suturing-disk with the wire stronger and more complete.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a suture-instrument, the combination,

with a pair of forceps having the opposing edges provided with curved recesses, of a shield having its slitted end contiguous to the said jaws.

2. In a suture-instrument, the combination of the curved recessed forcep-jaws, the slitted shield, and the cutter-provided pivoted arm, substantially as described.

3. In a suture-instrument, the combination of a pair of inter-pivoted forcep-jaws, a slitted shield having the same pivot as said jaws, and an arm pivoted to each of the jaws and provided with a cutting end, substantially as described.

4. The combination of the inter-pivoted forcep-plates having jaws  $A^2 A^3$ , recessed at *e* and *d*, the shield *B*, carried by pivot *D*, which connects the jaws, said shield having the end slit *B'*, and having also the oppositely-projecting springs *b b* between the lever-handles, and the cutter-arm *C*, pivoted to each of the aforesaid handles and having the curved cutting-recesses *C'*, all arranged substantially as described.

5. In a suture-instrument, a pair of inter-pivoted forcep-handles having jaws provided on their opposite inner edges with curved recesses adapted to receive a cleft-disk and compress the same tightly upon a wire.

6. The combination, in a suture-instrument, of a pair of pivoted forcep-jaws adapted to compress a disk between them and a third cutting-jaw having its arm pivoted to each of the forcep-jaws and its cutting-edge in proximity to the recessed faces of the jaws, substantially as described.

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

DAVID S. McCONNAUGHEY.

Witnesses:

D. J. DEWEY,

A. S. FOLGER.