





# UNITED STATES PATENT OFFICE.

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## SUTURE-INSTRUMENT.

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*To all whom it may concern:*

Be it known that I, WILLIAM GIBBONEY, JR., a citizen of the United States, residing at Wytheville, in the county of Wythe and State of Virginia, have invented a new and useful Improvement in Suture-Instruments, of which the following is a specification.

This invention relates to a suture-instrument designed to avoid the objections known to exist against the present method of sewing up wounds by hand.

The object of the invention is to construct a machine to effect this purpose, which machine will commend itself to the skillful surgeon as filling a want long felt by the profession, the arrangement of the parts being compact and devoid of cumbersomeness, so as to enable the operation to be readily performed, and the construction being the embodiment of simplicity, which will permit the machine or instrument to be placed on the market at such a price as to be within the reach of every practicing surgeon.

With these ends in view the invention consists in the novel construction, arrangement, and combination of parts, as will be hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a plan view illustrating my improved suture-instrument in operation, the skin or parts of the flesh having been caught and held by the clamping-jaws, the thread-catcher pushed forward, and the needle-driver forced through the two parts of flesh to carry the thread through. Fig. 2 is a bottom view showing the needle-driver drawn back slightly to cause the thread to slack, and thus permit the thread-catcher to engage with the thread. Fig. 3 is an elevation from one side of the instrument. Fig. 4 is an elevation, looking at the opposite side. Fig. 5 is a transverse section on the line *xx* of Fig. 2. Fig. 6 represents a modification in the shape of the clamping-jaws. Fig. 7 is a detail view representing the construction of the needle-driver when using a long needle.

Like letters refer to corresponding parts in the several figures.

Referring to the drawings, A designates the shank or body of my improved instrument, provided at one end with a handle, B, of any suitable construction. The front end of the

shank or body A is tapered or beveled on opposite sides, and at the point where the shank or body begins to taper are provided ears or lugs *a*. Clamping-jaws B B' are pivoted at an intermediate point of their length between the ears or lugs *a*, on opposite sides of the shank or body. Levers C C' are pivoted in ears *b*, projecting from the shank or body, and have their front ends pivoted to the inner or rear ends of the clamping-jaws B B'. The rear ends of the levers C C' extend back on opposite sides of the shank or body A, and rest upon a transverse bar, D, secured near its center to the body. Said bar is formed with detents *d d' d'*, one pair, *d d'*, being on each side of the body or shank.

The flat springs E E' are secured to the shank or body, and bear at their free ends against the inner sides of the levers C C', just in the rear of the pivot-point of such levers, the action of the springs serving to force the front ends of the levers inward and the rear ends outward. It will be understood that by forcing the rear curved ends of the levers C C' inward toward the shank or body until they become engaged with the detents *d' d'* of the bar D the front ends of the levers are thrown outward and the jaws forced inward against the front end of the body. The engagement of the levers C with the detents *d' d'* retains the jaws in this position, clamping the skin and holding it for the action of the needle-driver, as will be explained hereinafter.

To release the jaws automatically I provide a releaser, F, upon which the extreme rear ends of the levers C C' rest. This releasing device consists of a bar, *e*, arranged transversely of the shank or body, and cut out at *e'*, to work over the same on each side, a thumb-knob or projection, *f*, on the bar *e* near the center providing convenient means for operating the releaser. The ends of the bar *e* rest upon the ends of the levers C C', so as to allow the forcing of the levers down to disengage them from the detents *d' d'*. A spring-actuated pin, *g*, connects with the bar *e* at the center, passes through the shank or body, and has a head on its lower end. This pin *g* retains the bar *e* extended away from the shank or body, the ends of the bar resting lightly on the levers C C'. By pressing on the knob or

projection *f* the bar *e* is forced inward against the pressure of the spring, the ends of the bar bearing upward against the ends of the levers C C' to such an extent as to cause them to clear the detents *d' d'*, when the springs E E', which operate against the levers, throw them outward automatically until they strike against the outer detents, *d d*. By this action the jaws B B' have been thrown open to catch the flesh or skin again for the next stitch.

When the clamping-jaws are in position holding the flesh, they extend in an inclined line from the pivot-point to the front end of the shank or body. It is at the front end that the clamping of the flesh or skin is effected. By having the clamping-jaws extend in an inclined line and engaging with the shank or body only at the front end said jaws engage the skin much more firmly than if they were parallel with the shank or body and rested flat against the latter. The jaws B B' are provided with perforations *h h'*, which align with a corresponding perforation, *i*, in the front end of the shank or body. The perforation or eye *h* in the jaw B and the eye *i* of the shank A have their walls slotted or left open at *h' i'*.

G designates the needle-driver, pivoted at the inner end to the upper side of the shank or body A in rear of the pivot-point of the jaws B B', and provided at the outer end with a needle-head, *j*, in which is fitted the rear end or shank of the needle H. A screw, L, works through the head *j* against the shank of the needle to clamp it therein. A bell-crank lever, I, is pivoted to the shank or body, and has one end connected to the needle-driver G at an intermediate point of its length, and the other end connected to the forward end of the operating-handle J. Said handle is slotted to receive a screw, *m*, projecting from the shank or body, and is formed with a finger-loop, *k*. The needle-driver is worked by the insertion of the finger in the loop *k* and forcing the handle forward, the slot *m* permitting the forward and backward movement of the handle, and at the same time establishing a connection between the body of the instrument and the handle. The working of the handle J forward oscillates the bell-crank lever and draws the needle-driver back. By the backward movement of the handle J the bell-crank lever I is oscillated and the needle-driver pushed forward, the needle being forced through the perforations *h h' i* in the jaws and shank, respectively. As the front end of the needle-driver describes an arc of a circle in operation, the needle H is shaped correspondingly, being curved throughout its entire length. A spring, K, is secured to the shank or body and acts against the bell-crank lever I to force the needle-driver back out from the jaws.

Secured to the center of the shank or body, on the under side, is a bobbin, L, on which the silk to be used with the instrument is wound. The silk thread from the bobbin is carried forward along one side of the instrument and threaded through the eye of the needle from

the outside. The thread-catcher M consists of a straight rod, which works through guides *n o*, projecting from the shank or body, and is provided at the rear end with a finger-loop, *p*. The front end of the thread-catcher is formed with an engaging point or lip, *q*, to engage the thread, and in rear of said point or lip is provided a raised projection, *r*. The front lower face of the thread-catcher rubs against an arm, *s*, projecting outward from the shank or body, and when forced forward the projection *r* catches around the arm *s*, to limit the forward movement. As the thread-catcher has a slight spring action and the arm is rounded, it will be seen that the projection can be readily disengaged from the arm to allow the backward or return movement of the thread-catcher.

The operation of my invention will be readily understood from the foregoing description, taken in connection with the annexed drawings.

The surgeon, with a pair of forceps of the usual style, catches the flesh on one side of the wound and places it between one jaw and the shank, and by means of the lever forces the jaw against the shank or body to clamp the flesh or skin. The flesh or skin on the other side is proceeded with in a similar manner and clamped by the other jaw. The thread-catcher M is then pushed forward to the extreme limit of its movement. The needle having been threaded, the needle-driver is operated by the handle J, the latter being drawn backward, to swing the needle-driver in toward the shank or body and force the needle through the perforations or eyes of the jaws and shank. As the two sides of the flesh or skin of the wound come between the eyes, it will be seen that the needle punctures the skin or flesh and carries the silk thread through to the other side of the instrument. Fig. 1 represents the position of the parts at this stage of the operation, the needle being worked across the path of the front end of the thread-catcher and the thread doubled in the puncture or opening made by the needle. This doubling of the thread is effected by having the end drawn through the eye of the needle some distance, doubled at the eye, and turned back, as clearly shown in Fig. 1. The handle J is then pushed forward slightly to withdraw the needle about one-sixteenth ( $\frac{1}{16}$ ) of an inch and cause a little slack in the thread, this slack thread being caught by the thread-catcher, and in the backward movement of the latter the thread is drawn back or out through the skin, as shown in Fig. 2. The thread-catcher may be drawn back any desired distance, and when the proper movement of the thread-catcher is reached or completed the needle is withdrawn entirely from the eyes of the jaws. The releaser F is then operated to disengage the levers C C' from the detents *d' d'* and release the jaws B B' from the flesh or skin. The looped doubled thread is then disengaged from the thread-catcher and cut to the proper length, when the stitch is com-

pleted and the instrument ready for making the second stitch.

In Fig. 6 is represented a different form to the jaws B B', which are curved upward, the front end of the shank or body being correspondingly curved. This improved construction is specially designed for use in operations of the vagina and kindred ruptures.

The advantages of my instrument and apparatus will be readily understood and appreciated.

Each stitch made will be formed of a double thread, which will add materially to the strength and appearance of the ligature.

The springs EE' serve to automatically force the jaws apart or outward as soon as the releaser F is operated.

The spring K assists the withdrawal of the needle-driver after the stitch has been made. When using a long needle, the needle-driver is adjusted down, as shown in Fig. 7, into the second opening, *u*, in the body A.

Having described my invention, I claim—

1. In a suture-instrument, the shank or body, in combination with the clamping means for the skin or flesh carried by the shank or body and the needle-driver connected to the latter and carrying the needle to be passed through the skin or flesh, as set forth.

2. In a suture-instrument, the combination, with the clamping means for the flesh or skin, of the needle-driver carrying the needle and the thread-catcher to engage with the thread, as set forth.

3. In a suture-instrument, the combination, with the spring-actuated clamping-jaws for the flesh or skin and means to hold the jaws closed and allow the releasing thereof automatically, of the needle-driver carrying the needle, as set forth.

4. In a suture-instrument, the spring-actuated clamping-jaws for the flesh or skin, detents to lock the jaws closed, and a releaser to disengage the jaws from the detents, as set forth.

5. In a suture-instrument, the body or

shank, in combination with the needle-driver connected thereto and carrying the needle, and means, substantially as described, for operating the needle-driver, as set forth.

6. In a suture-instrument, the shank or body, in combination with the spring-actuated jaws for clamping the skin or flesh working on opposite sides of the shank or body, detents for locking the jaws, and a releaser for disengaging the jaws from the detents, as set forth.

7. In a suture-instrument, the combination, with the shank or body, of spring-actuated clamping-jaws on opposite sides thereof, levers connected to the jaws, detents for locking the levers, and a releaser for disengaging the levers from the detents, as set forth.

8. In a suture-instrument, the combination, with the needle-driver to pass the thread through the skin or flesh, of the thread-catcher having its engaging-point adapted to come in the path of the needle of the driver, so as to catch the thread, substantially as described.

9. In a suture-instrument, the combination, with the swinging needle-driver, of the sliding thread-catcher and the clamping-jaws, as set forth.

10. In a suture-instrument, the thread-catcher working forward and backward in guides, in combination with the needle-driver carrying the needle and a series of connecting levers and bars to operate the needle-driver, as set forth.

11. In a suture-instrument, the shank or body, in combination with the needle-driver pivoted thereto, the bell-crank lever connected to the needle-driver, and the sliding handle to operate the lever, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM GIBBONEY, JR.

Witnesses:

D. S. PEIRCE,

J. C. GREEN.