Sept. 13, 1932. B. THOMPSON 1,876,792

SUTURING DEVICE

Filed June 30, 1930

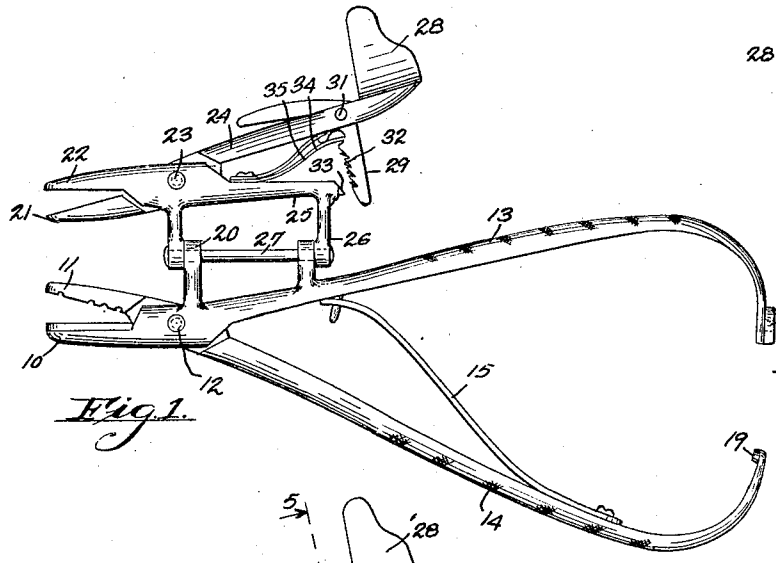


Fig. 1.

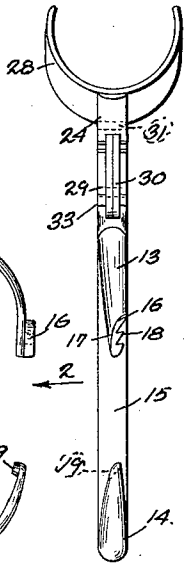


Fig. 2.

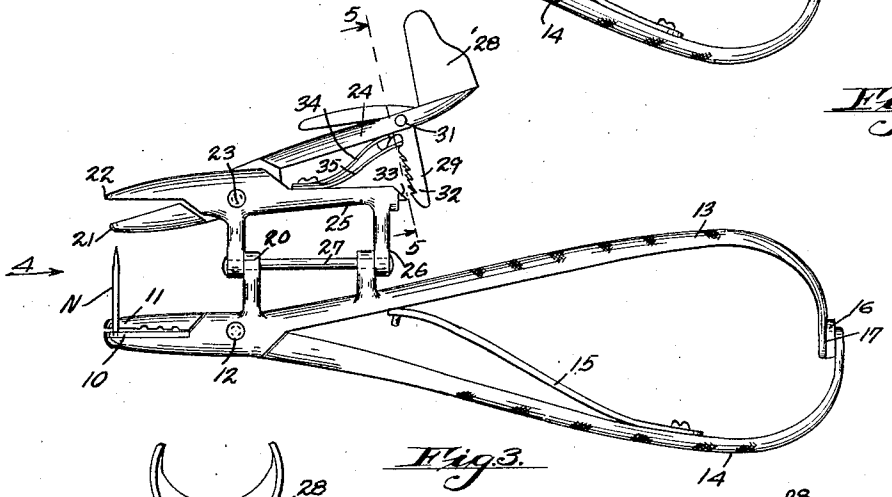


Fig. 3.

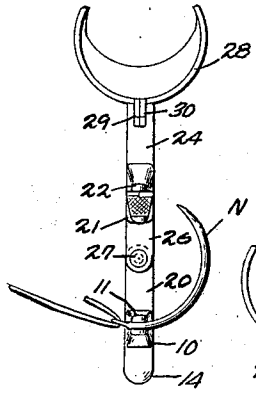


Fig. 4.

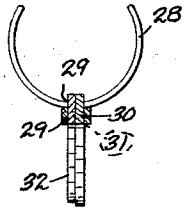


Fig. 5.

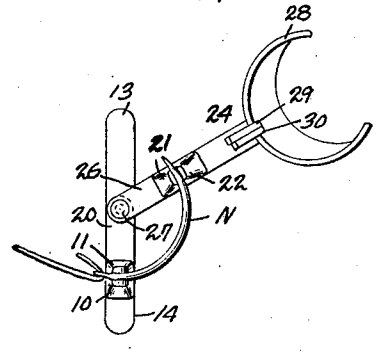


Fig. 6.

Inventor
Basil Thompson
by Hazard and Miller
Attorneys

Patented Sept. 13, 1932

1,876,792

UNITED STATES PATENT OFFICE

BASIL THOMPSON, OF TUCSON, ARIZONA

SUTURING DEVICE

Application filed June 30, 1930. Serial No. 464,874.

This invention relates to a suturing device and concerns a construction which has been primarily designed for use by surgeons and the medical profession in general.

An object of the invention is to provide an improved suturing device consisting of a main or primary pair of forceps to which an auxiliary pair of forceps is hingedly connected. By the improved construction a curved needle, such as is generally employed for this purpose, can be forced or caused to penetrate by the main or primary forceps and after having been forced into and out of the flesh the auxiliary pair of forceps may be swung near the projecting end of the needle and caused to grasp it, pulling the needle through. The arrangement is such that the axis of rotation is equi-distant from the jaws of the forceps and the distance is approximately equal to the radius of curvature of the needle so that the auxiliary forceps on being swung will swing into proper position adjacent the projecting end of the needle.

Other objects of the invention are to provide an improved suturing device which is of relatively simple, durable construction, and which may be easily manipulated, only one hand being required for the manipulation of the entire construction.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, and specifically pointed out in the appended claims, reference is had to the accompanying drawing for an illustrative embodiment of the invention, wherein:

Fig. 1 is a view in side elevation of the improved suturing device illustrating the forceps in open position.

Fig. 2 is a view in end elevation taken in the direction of the arrow 2 upon Fig. 1.

Fig. 3 is a view similar to Fig. 1 illustrating the main pair of forceps as grasping a needle.

Fig. 4 is a view in end elevation taken in the direction of the arrow 4 upon Fig. 3.

Fig. 5 is a sectional view taken upon the line 5—5 upon Fig. 3.

Fig. 6 is a view similar to Fig. 4 illustrating the manner in which the device is manipulated.

Referring to the accompanying drawing, wherein similar reference characters designate similar parts throughout, the improved suturing device comprises a main pair of forceps having jaws 10 and 11 pivoted as at 12 and having relatively long handles 13 and 14. These handles are urged into separated position by means of a leaf spring 15. The upper handle 13 at its rear end is provided with a projection 16, one side of which is curved as at 17 and the other side of which is provided with ratchet teeth 18. The lower handle 14 is provided with a single tooth 19 adapted to be engaged by the ratchet teeth 18. However, if the handles 13 and 14 are flexed sufficiently to force all of the ratchet teeth 18 past the projection 19, on subsequently releasing the handles the curved surface 17 will engage the tooth 19, allowing the forceps to open. The purpose of the ratchet teeth 18 is merely to temporarily lock or hold the main or primary forceps in needle grasping position.

The upper handle 13 is provided with a pair of knuckles 20. An auxiliary pair of forceps having jaws 21 and 22 pivoted at 23 has relatively short handles or arms 24 and 25. The arm 25 is likewise provided with a pair of knuckles 26 and a pintle 27 extends through the knuckles, serving to hingedly connect the auxiliary forceps to the primary forceps. The pintle 27, constituting the axis of rotation of the auxiliary forceps with respect to the main forceps, is disposed centrally between jaws 10 and 22 and is parallel to the longitudinal central axes through these jaws. In this manner the auxiliary forceps when in the position shown in Figures 1, 3 and 4, has jaw 22 in spaced parallel relation to jaw 10. The upper handle 24 of the auxiliary forceps is provided with a channel shaped member 28 adapted to receive the thumb of the manipulator. Forwardly of this channel member there is formed a slot in which two angular members 29 and 30 are pivoted as upon a pivot pin 31. The upper portions of these angular members extend forwardly from the thumb receiving members 28 and are so arranged as to be capable of

being depressed by the thumb when in the thumb receiving member. The depending portions of the angular members are provided with ratchet teeth 32, the ratchet teeth on one member being slightly higher than the ratchet teeth on the other member, as clearly shown in Figure 5. A tooth 33 is formed on handle 25 adapted to be engaged by the depending portions of the angular members 29 and 30. Leaf spring 34 urges the auxiliary forceps into open position and leaf spring 35 urges the angular members 29 and 30 into a position wherein they will engage tooth 33.

The operation and advantages of the improved suturing device are as follows. The curved needle N has its end positioned between jaws 10 and 11 of the main forceps. The main forceps are then closed and locked in grasping position by ratchet teeth 18 engaging tooth 19. In this position the curved needle can be forced or caused to penetrate the flesh in making a stitch. By virtue of its curvature it may be caused to enter the flesh and then protrude through the skin at an adjacent point. During this penetration of the needle the main forceps are held with the upper handle 13 resting across the palm of the hand and the fingers encircling handle 14. The thumb of the operator rests in the thumb receiving member 28. When the pointed end of the needle is forced through, the auxiliary forceps are then swung laterally by the thumb, as shown in Figure 6, and by virtue of the fact that the distance between pintle 27 and jaw 22 is equal to the radius of curvature of the needle, jaw 22 will swing against the outer side of the pointed end of the needle. The operator then presses the thumb receiving member 28 to close the auxiliary forceps on the needle. A mere downward movement not only closes the auxiliary forceps but causes the auxiliary forceps to be locked in needle grasping position by virtue of the engagement of one of the sets of ratchet teeth with tooth 33. When the needle has thus been grasped by the auxiliary forceps, the handles 13 and 14 may be forced closer together to produce a disengagement between ratchet teeth 18 and tooth 19, thus opening the primary forceps. The needle can then be pulled through by the auxiliary forceps, thus completing the stitch. During this pulling through of the needle the primary forceps may be held stationary, acting somewhat as a guide or base on which the auxiliary forceps pivot, thus drawing through the needle along its own line, that is without working the needle laterally in the needle hole formed thereby.

From the above described construction it will be readily appreciated that a novel, simple and advantageous suturing device is provided which can be easily manipulated by one hand. The improved device permits stitches to be easily and quickly taken in a very advantageous manner and while the device has been primarily designed for use by surgeons and the medical profession in general, it will be readily appreciated that its uses are not necessarily restricted thereto.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A suturing device comprising a pair of forceps, and a second pair of forceps hingedly connected thereto for rotation about an axis parallel to the longitudinal axis through one of the jaws of the first pair of forceps.

2. A suturing device comprising two pair of forceps, one jaw of each pair of forceps being hingedly connected together for rotation about an axis parallel to the longitudinal axes through the mentioned jaws, said axis being equi-distant from said jaws of the forceps.

3. A suturing device comprising two pair of forceps, one jaw of each pair of forceps being hingedly connected together for rotation about an axis parallel to the longitudinal axes through the mentioned jaws, said axis being equi-distant from said jaws of the forceps, each distance being equal to the radius of curvature of a curved needle.

4. A suturing device comprising needle holding means for holding a curved needle, and an auxiliary pair of forceps movably connected thereto adapted to be caused to grasp the needle while held by the needle holding means, said auxiliary forceps having means for holding its jaws in needle engaging position.

5. A suturing device comprising a main pair of forceps, an auxiliary pair of forceps, one jaw of the main pair being hingedly connected to one jaw of the auxiliary pair so that the jaws may assume spaced parallel positions equidistant from the axis of rotation.

6. A suturing device comprising a main pair of forceps, an auxiliary pair of forceps, one jaw of the main pair being hingedly connected to one jaw of the auxiliary pair so that the jaws may assume spaced parallel positions equidistant from the axes of rotation, and means for fastening the jaws of each pair of forceps in needle engaging position.

7. A suturing device comprising a main pair of forceps having relatively long handles, an auxiliary pair of forceps having relatively short handles, means hingedly connecting one handle of the auxiliary forceps to one handle of the main forceps, the other handle of the auxiliary forceps being provided with a thumb receiving member, ratchet means pivotally connected to said other handle adapted to engage upon the hinged handle, spring means urging the auxiliary forceps into open position, and spring

means urging the ratchet means into engaging position.

8. A suturing device comprising a primary pair of forceps having a transversely extending pivot, an auxiliary pair of forceps having a transversely extending pivot, and means hingedly connecting one pair of forceps to the other, the axis of the hinge extending longitudinally and being arranged between the forceps.

9. A suturing device comprising two pair of forceps, and means hingedly connecting one pair of forceps to the other, the axis of the hinge extending longitudinally and being arranged between the forceps.

In testimony whereof I have signed my name to this specification.

BASIL THOMPSON.