E. W. SAUNDERS & E. H. STEEDMAN.

SURGICAL NEEDLE HOLDER.

APPLICATION FILED JUNE 30, 1913.

1,131,163.

Patented Mar. 9, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

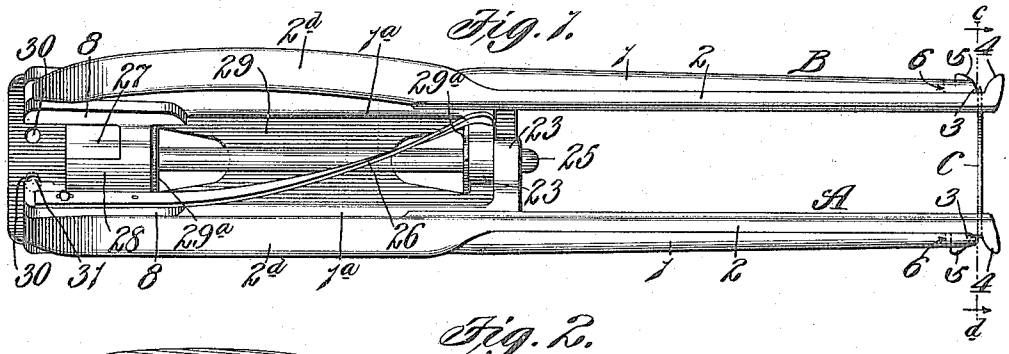


Fig. 2.

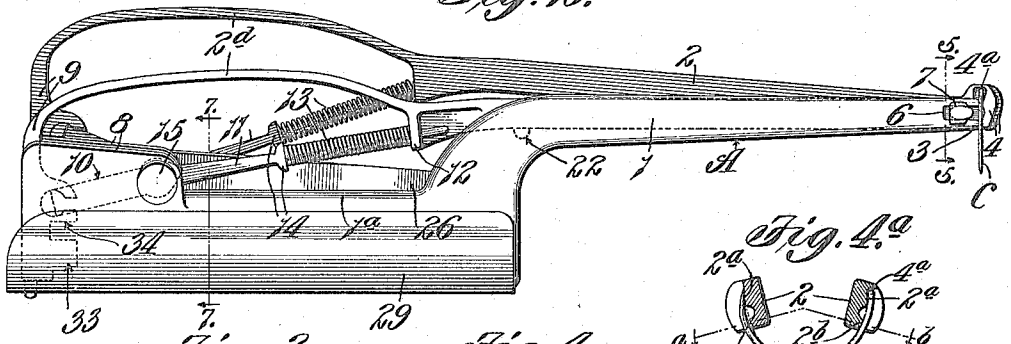


Fig. 4a.

Fig. 3.

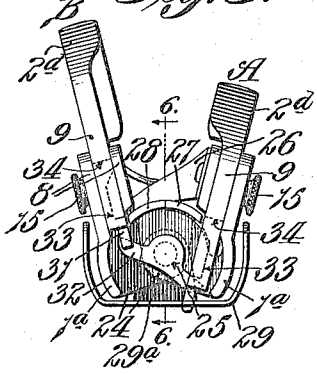


Fig. 4.

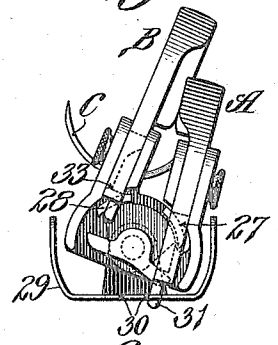


Fig. 5.

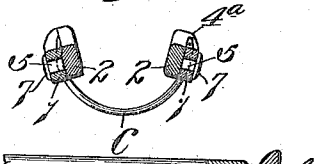


Fig. 6a.

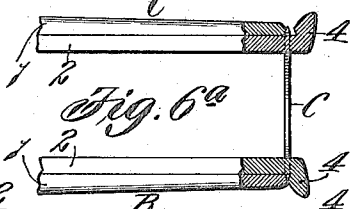
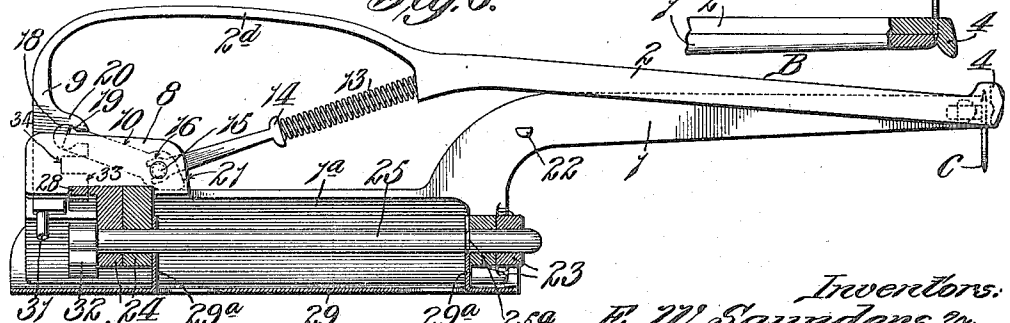


Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 7.

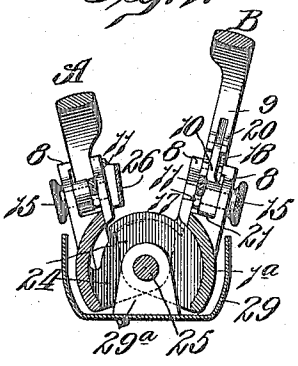


Fig. 8.

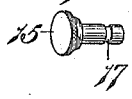


Fig. 9.

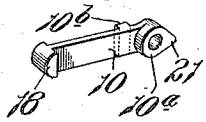


Fig. 10.

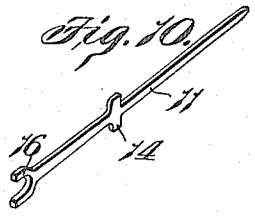


Fig. 11.

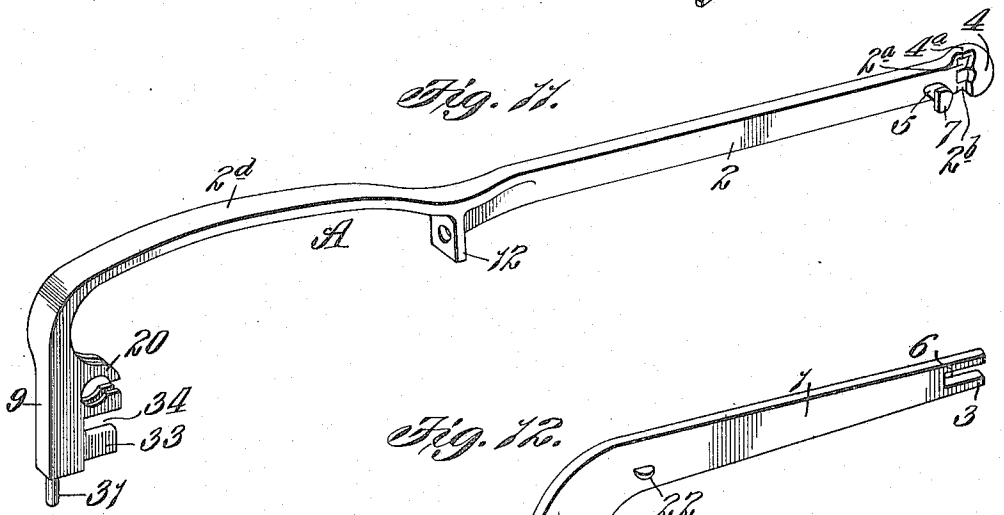


Fig. 12.

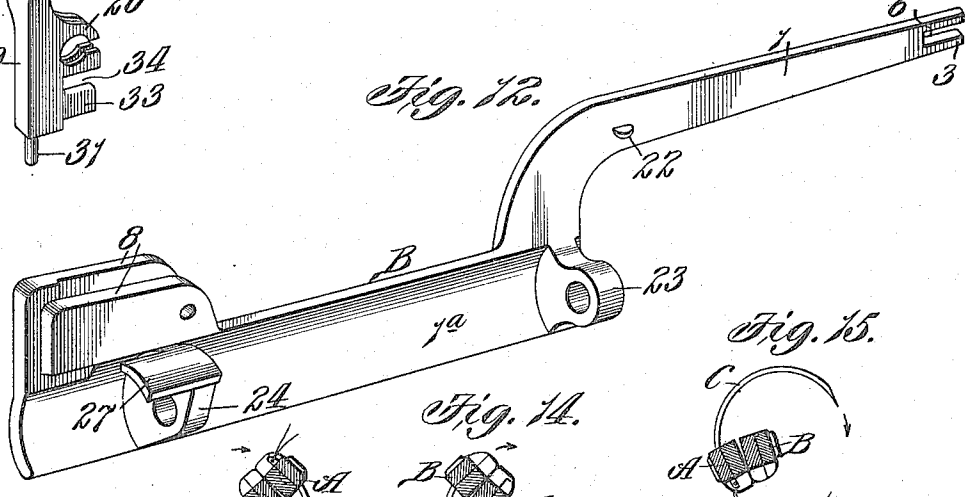


Fig. 13.

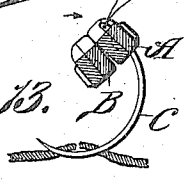


Fig. 14.

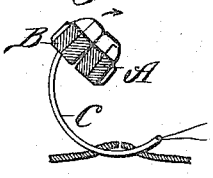


Fig. 15.

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EDWARD W. SAUNDERS AND EDWIN H. STEEDMAN, OF ST. LOUIS, MISSOURI.

SURGICAL NEEDLE-HOLDER.

1,131,163. Specification of Letters Patent. Patented Mar. 9, 1915.

Application filed June 30, 1913. Serial No. 776,659.

To all whom it may concern:

Be it known that we, EDWARD W. SAUNDERS and EDWIN H. STEEDMAN, both citizens of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Surgical Needle-Holders, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to needle-holders, and particularly to surgical needle-holders, although the invention is applicable to various kinds of needle-holding devices that are used for forcing a needle into the material or substance being sewed, and then gripping the point of the needle and pulling it through the material.

The surgical needle-holders that are now in general use consist of a small hand tool with which the surgeon grasps the rear end or eye portion of the needle so as to hold the needle firmly while the point is being forced through the material or parts that are to be sewed together. After the point of the needle has passed through the material being sewed the surgeon releases the rear end or eye portion of the needle and then grasps the point of the needle either with the same needle-holder or another needle-holder held in his other hand so as to pull the needle through and out of the material or object into which it was inserted. Usually, an assistant is employed to grasp the point of the needle and pull it through the substance into which the needle was inserted by the surgeon, but in some classes of surgical work it is necessary for the surgeon to perform both operations, namely, insert the needle and then release it and grasp the point so as to pull it through the material. Great skill and dexterity on the part of the surgeon and his assistant are necessary in using a needle-holder of the type now in general use, and even with a skilful surgeon and assistant the needle is sometimes broken in grasping the point portion of the same so as to pull it through the material or object being being sewed, thus resulting in great delay in hunting for the broken parts of the needle. Furthermore, as no means is provided for protecting the point of the needle when the needle and needle-holder are being introduced into a cavity in which the organ to be sewed is located, great skill and care on the part of the surgeon is necessary in order to prevent injury to the patient, it being the usual practice for the surgeon to arrange his finger longitudinally of the needle so as to protect the point of the needle and prevent it from sticking into the patient accidentally. The surgeon also has to protect the point of the needle after it has passed through the parts being sewed so as to prevent injury to delicate organs adjacent the part being sewed, and very frequently the surgeon's hand is injured by the needle in trying to prevent the needle from sticking into the patient accidentally.

From the foregoing it will be seen that there are numerous objectionable features to the surgical needle-holders now in general use.

One object of our invention is to provide a surgical needle-holder which is so designed that the point of the needle is protected when the holder and the needle are being introduced into a cavity or through an incision, thereby overcoming the necessity of the surgeon protecting the point of the needle with his finger and also eliminating the possibility of accidentally injuring the patient or the surgeon's hand.

Another object is to provide a surgical needle-holder which is so designed that there is no liability of the patient or the surgeon being injured accidentally by the needle during the operation of sewing with the same.

Another object is to provide a surgical needle-holder which is so designed that a cut or wound can be sewed up with same in less time than is possible with a surgical needle holder of the kind now in general use and without liability of breaking the needle.

Another object is to provide a needle-holder which is so designed that a surgeon of average skill can sew with same skilfully and without the aid of an assistant.

Another object is to provide a needle-holder which is so designed that one or the other end portions of the needle is always grasped and held firmly by the holder when it is in use, thereby eliminating the possibility of accidentally dropping the needle during the sewing operation. And still another object is to provide a surgical needle-holder that comprises only a few parts of simple construction which can be taken apart easily so as to sterilize them and thereafter assembled easily.

Other objects and desirable features of

our invention will be hereinafter pointed out.

Figure 1 of the drawings is a top plan view of a surgical needle-holder constructed in accordance with our invention; Fig. 2 is a side elevational view of same; Fig. 3 is a rear end view showing the parts of same in their normal position, namely, gripping one end of the needle and protecting the opposite end of the needle; Fig. 4 is also a rear end view showing one of the needle-operating members moved toward the other needle-operating member that grips the needle so as to expose or uncover the point of the needle; Fig. 4[a] is a cross sectional view taken on the line *c*—*d* of Fig. 1, looking in the direction indicated by the arrow; Fig. 5 is a cross sectional view taken on the line 5—5 of Fig. 2, looking in the direction indicated by the arrow; Fig. 6 is a vertical longitudinal sectional view taken through the center of the device; Fig. 6[a] is a top plan view of portions of the needle-operating members, partly broken away on the line *a*—*b* of Fig. 4[a] so as to more clearly illustrate the construction of the needle-clamping jaws on said members; Fig. 7 is a cross sectional view taken on the line 7—7 of Fig. 2, looking in the direction indicated by the arrow; Fig. 8 is a perspective view of one of the toggle pins; Figs. 9 and 10 are perspective views of the toggle links that form part of each of the needle-operating members of the holder; Fig. 11 is a perspective view of the movable part or needle-clamping means of one of the needle-operating members; Fig. 12 is a perspective view of the coöperating stationary part of said needle-operating member; and Figs. 13, 14 and 15 are diagrammatic views illustrating the method of sewing two parts together.

We have herein shown our invention embodied in a surgical needle-holder but we do not wish it to be understood that our invention is limited to a needle-holder of the character mentioned or to a manually-operated needle-holder for our broad idea is applicable to various kinds of devices that are employed for handling or actuating a needle during the operation of sewing with the needle.

Briefly described, our invention consists in a needle-holder which comprises a needle-operating member that grips one end portion of the needle, the eye portion for example, so as to hold the needle firmly while it is being inserted into the material or parts that are to be sewed, and a separate and distinct needle-operating member that is adapted to grip the opposite end portion of the needle so as to enable the needle to be drawn through the material or parts into which it is inserted and thus complete the stitch. Said needle-operating members are so designed and arranged that both end portions of the needle are normally protected in such a manner that it is impossible for the needle to accidentally stick into the patient or into the hand of the person using the device but only one of said needle-operating members grips the needle at the same time. Said needle-operating members are adapted to be moved bodily toward and away from each other out of axial alinement with the needle so as to uncover the end portion of the needle that is not grasped by the device and thus enable the needle to be inserted into the material being sewed or drawn completely through said material, and said members are preferably constructed in such a manner that the act of gripping one end of the needle automatically releases the opposite end of the needle which had previously been gripped by the device. We prefer to provide the device with means whereby it is impossible to release the needle from one of the needle-operating members unless the coöperating needle-operating member is in position to receive the opposite end of the needle. The device also comprises various other novel features which will be hereinafter pointed out.

Referring to the drawings which illustrate the preferred form of our invention, A and B designate two coöperating needle-operating members of similar construction that are arranged parallel to each other, as shown in Fig. 1. Said members are mounted in such a manner that they can be moved bodily toward and away from each other out of axial alinement with the needle during the operation of sewing with the device, and they are so positioned with relation to each other that when they are separated or in their normal position, as shown in Fig. 1, both end portions of the needle C will be protected in such a manner that it is impossible for the point or the eye of the needle to accidentally stick into the patient or into the hand of the surgeon using the device.

In the embodiment of our invention herein shown, each of the members A and B comprises a stationary part or body portion 1 and a movable part or needle-clamping means 2 that is adapted to be moved with relation to the stationary part 1 so as to clamp and release the needle but which is combined with said stationary part 1 so that it moves laterally with same when the needle-operating member that said parts form is moved bodily toward and away from the coöperating needle-operating member of the device. The stationary part or body portion 1 is provided at its rear end with a handle 1[a] and at its front end with a needle-clamping jaw 3. The movable part or needle-clamping means 2 is also provided at its rear end with a handle 2[a] and at its front end with a needle-clamping jaw 4.

The coöperating faces of said jaws are beveled in opposite directions, as shown in Fig. 6[a], so as to conform approximately to the cross sectional shape of the needle and form overhanging walls that lap over the needle and thus force the needle into engagement with bearing surfaces 2[a] and 2[b] on the side of the movable part 2, as shown in Fig. 4[a], when the jaws are closed. The movable part 2 bears against one side of the stationary part 1, and said parts are connected together in such a manner that the part 2 can move longitudinally with relation to the part 1 so as to open and close the coöperating needle-clamping jaws 3 and 4 on said parts. One convenient way of connecting the parts 1 and 2 together is to provide the movable part 2 with a laterally projecting lug 5 that fits in a horizontally disposed slot or opening 6 formed in the front end of the stationary part 1, as shown in Fig. 2, so as to guide the part 2 longitudinally with relation to the stationary part 1, the lug 5 being provided at its outer end with a head 7, as shown in Figs. 2 and 5, that laps over the outer face of the stationary body portion 1 so as to prevent the parts 1 and 2 from moving laterally with relation to each other. As shown in Fig. 1, the jaw 4 and the lug 5 on the movable part 2 are provided with inclined surfaces that coöperate with each other to form a substantially V-shaped guideway which guides the needle into operative position between the needle-clamping surfaces on the jaws 3 and 4 in case the needle has been bent laterally while in the parts being sewed. This is an important feature of our device for it insures the needle being positioned properly with relation to the clamping jaws even though the needle has become bent laterally out of its normal plane during the sewing operation, the inclined surfaces on the jaw 4 and on the lug 5 being so designed that one or the other of said surfaces will bear against the end portion of the needle if the needle has been deflected laterally, and move it into such a position that the clamping jaws will grip it when said jaws are closed. In addition to the means just described for positioning the needle laterally with relation to the needle-gripping jaws on the members A and B, we have provided the device with means for positioning the needle axially, or, in other words, prevent it from creeping longitudinally in either direction, and thus assuming such a position that it will be out of the path of the needle-gripping jaws on the members A and B when said jaws are closed to clamp the needle. The means herein shown for this purpose consists of a small lug or laterally projecting shoulder 4[a] on the movable part 2 of the member A that forms an abutment against which the eye end of the needle is forced when the point portion of the needle is gripped by the jaws on the member B, as shown in Fig. 4[a]. The bearing faces 2[a] and 2[b] on both of the parts 2 that bear against the inner curved side of the needle, are formed on a curve whose radius is approximately the same as the curvature of the needle, but the end portions of the needle are bent to the right slightly, looking at Fig. 4[a], so that the needle will not be a perfectly true circle. Consequently, when the needle-operating member B moves to the left, looking at Fig. 4[a] to receive the point portion of the needle, the bearing face 2[a] on the part 2 of the member B strikes the needle but the bearing face 2[b] on said part is spaced away slightly from the inner curved side of the needle. Thereafter, when the jaws on the member B are closed to grip the needle, the overhanging walls on said jaws have a substantially cam action on the needle and positively force it into engagement with the other bearing face 2[b], thus exerting pressure on the needle in such a manner that it tends to move toward the shoulder or lug 4[a] on the member A. In view of the fact that the lug 4[a] laps over the eye end of the needle, the needle cannot creep or move longitudinally when the jaws of the member B are closed to grip the needle, but the act of closing said jaws always tends to force the eye end of the needle toward the shoulder 4[a]. When the member A moves to the right, away from the member B so as to receive the eye portion of the needle, the bearing face 2[b] on the part 2 of the member A strikes against the inner curved side of the needle but the bearing surface 2[a] on said part 2 is spaced away slightly from the needle. The act of closing the jaws of the member A to grip the needle, however, forces the upper end of the needle inwardly against the bearing surface 2[a] and also against the underside of the lug 4[a], thus exerting pressure on the needle in such a manner that the point portion springs outwardly slightly as soon as it is released by the jaws of the member B.

From the foregoing it will be seen that we have constructed the device in such a manner that the act of closing the jaws of the member B tends to force the eye end of the needle against the shoulder or lug 4[a] and the act of closing the jaws of the member A also tends to force the eye of the needle toward said lug 4[a]. Consequently it will be impossible for the needle to creep into such a position that it will not be engaged by the needle-gripping jaws when they are closed. While we prefer to bend the end portions of the needle slightly out of a true circle and form the bearing surfaces 2[a] and 2[b] on the curvature of a true circle, the same result could be accomplished by leaving the needle in a true circle and forming the bearing surfaces 2[a] and 2[b] on a slightly different radius from the

needle so as to cause the needle to be put under a slight tension and force the eye end of same against the lug 4^a when the jaws were closed. Therefore, we do not wish it to be understood that our broad idea is limited to the exact construction herein shown for positioning the needle axially or preventing it from creeping longitudinally into an incorrect position. The handle 1^a is provided adjacent its rear end with a pair of ears 8 that embrace a depending portion or tail-piece 9 on the handle 2^d of the movable part 2 and thus prevent the handles 1^a and 2^d from moving laterally with relation to each other, and a link 10 is pivotally connected to the ears 8 and to the depending tail-piece 9 of the handle 2^d in such a manner that it causes the part 2 to move longitudinally with relation to the stationary part or body portion 1 when the handle of the part 2 is raised and depressed, as hereinafter more clearly described.

In the embodiment of our invention herein shown, the link 10 forms one element of a toggle whose other element consists of a link 11 connected at one end to the ears 8 and having its opposite end projecting loosely through a perforated guide lug 12 on the movable part 2, a coiled expansion spring 13 being mounted on the link 11 between one side of the lug 12 and a stop 14 on the link 11, as shown clearly in Fig. 2. When the handle 2^d is depressed or moved toward the handle 1^a, the part 2 will move longitudinally of the part 1 to the left, looking at Fig. 2, and thus cause the jaw 4 on the movable part 2 to clamp the needle C tightly against the jaw 3 at the end of the stationary body portion 1 and also force the needle into engagement with the bearing surfaces 2^a and 2^b on the side of the part 2, this movement of the part 2, of course, being due to the fact that the handles 2^d and 1^a are joined together by the toggle link 10 which turns about a fulcrum pin in the ears 8 on the handle 1^a. The movement of the part 2 to the left, looking at Fig. 2, causes the spring 13 on the toggle link 11 to be compressed or placed under tension so that it will expand and thus move the part 2 to the right far enough to release the needle when the handle 2^d is raised or moved upwardly, as hereinafter described. Fig. 2 of the drawings shows the handle 2^d of the needle-operating member A depressed, and by referring to said figure it will be seen that the toggle links 10 and 11 of the member A have passed dead center or assumed such a position that they hold the said handle 2^d in its depressed position, thus overcoming the necessity of the user exerting downward pressure on the handle 2^d after the movable part 2 has been actuated to clamp the needle. The toggle links 10 and 11 can be connected to the ears 8 of the handle 1^a in any suitable manner but we prefer to connect said parts together in the manner herein shown on account of the fact that it enables them to be taken apart easily and also assembled easily. A removable pin 15 passes through the ears 8 on the handle 1^a and through the inner end of the link 10, and the toggle link 11 is provided at its inner end with a fork or bifurcated portion 16 that embraces the pin 15 and projects into a groove 17 in said pin so as to lock it in operative position in the ears 8, the bifurcated inner end of the link 11 extending alongside of the inner end of the link 10, and both of said links being arranged between the ears 8, as shown clearly in Fig. 7. The spring 13 always exerts sufficient endwise pressure on the toggle link 11 to hold the fork on the inner end of said link securely seated in the groove 17 in the pin 15 so that there is no liability of said pin slipping out of the ears 8. The outer end of the link 10 is provided with a transversely disposed trunnion 18 of substantially semi-cylindrical-shape in cross section that is seated in an opening 19 formed in an inwardly projecting lug 20 on the depending tail-piece 9 of the handle 2^d, said lug being provided with a vertical slot in which the link 10 moves. By arranging the link 10 in a substantially vertical position the half trunnion 18 on the outer end of same can be introduced into the opening 19 of the lug 20, and after the inner end of said link has been connected to the ears 8 by the removable pin 15 it is impossible for the half trunnion 18 to slip out of the lug 20. It will, of course, be understood that the link 10 could be connected to the handle 2^d in various other ways but we prefer the construction above-described on account of the fact that it can be assembled and disassembled easily and it does not comprise a separate pivot pin. A projection 21 on the inner end of the link 10 strikes against the handle 1^a when the handle 2^d moves upwardly and thus limits the upward movement of the handle 2^d, and a stop 22 is arranged on the stationary part 1 in such a position that the movable part 2 will strike against same when the handle 2^d is depressed so as to limit the downward movement of the handle 2^d and thus prevent the person using the device from exerting so much pressure on the handle 2^d that it buckles or springs sufficiently to release the needle. In order to hold the link 10 in proper position between the ears 8 so that the bifurcated portion 16 of the toggle link 11 can be slipped alongside of same during the operation of assembling the device, we have provided the link 10 with a boss 10^a that projects laterally from one side of the link and with a lug 10^b that projects laterally from the opposite side of said link, as shown in Fig. 9, said boss and link bearing against the pair of ears 8 and thus holding the link 10 spaced far

enough away from one of said ears to permit the toggle link 11 to be arranged in operative position.

As previously stated, the needle-operating members A and B are connected together or are mounted in such a manner that they can be moved toward and away from each other out of axial alinement with the needle so as to uncover one end or the other of the needle and thus permit the needle to be inserted into the material being sewed or drawn completely through said material. In the embodiment of our invention herein shown, the members A and B are so mounted that they can be oscillated about an axis extending longitudinally of said members. As shown in Figs. 6 and 12 the handles 1^a on the stationary parts 1 of the members A and B are provided on their inner sides with cooperating lugs 23 and 24 through which a shaft 25 passes so as to pivotally connect the members A and B together and thus permit the member B to be moved toward and away from the member A and vice versa. A flat leaf spring 26, which is arranged between the handles 1^a and is securely connected at one end to one of said handles, tends to hold the members A and B separated, as shown in Fig. 1, and means is provided for limiting the lateral movement of the members A and B with relation to each other so that when said members are in their normal position, as shown in Fig. 1, the needle-clamping or gripping means on the outer ends of same will be positioned at the opposite ends of the needle C. The means herein shown for limiting the lateral movement of the members A and B consists of a segmental-shaped flange 27 on the lug 24 of the handle 1^a of the member B that coöperates with a segmental-shaped flange 28 formed on the lug 24 of the handle 1^a of the member A, said coöperating segmental-shaped flanges being so designed and arranged that they will butt against each other when the members A and B are separated, as shown in Figs. 1 and 3. When the member B is moved laterally toward the member A, as shown in Fig. 4, the flange 27 on the member B moves away from the flange 28 on the member A, as shown in Fig. 4, and when said member B is moved laterally in the opposite direction the flange 27 thereon strikes against the flange 28 and thus limits the lateral movement of the member B. Various other means may be employed, however, for separating the members A and B and limiting the lateral movement of said members so that we do not wish it to be understood that our invention is limited to the construction herein shown. We prefer to provide the holder with a guard 29 that lies under the handles 1^a of the members A and B and also equip the members A and B with means for automatically locking said guard to the members A and B alternately during the operation of using the device so as to enable the person using the holder to more accurately control the lateral movement of the members A and B. This guard 29 and the means for automatically locking the members A and B to said guard are not absolutely essential to the successful operation of our device, however, and while we prefer to construct the device in this manner so as to cause the member which clamps the needle to remain stationary when the other member is being moved toward and away from same, said parts could be omitted without departing from the spirit of our invention. In the embodiment of our invention herein shown, the guard 29 is substantially channel-shape or semi-cylindrical-shape in cross section, and is provided with upwardly projecting wings 29^a through which the shaft 25 passes, as shown in Fig. 6, one of said wings being split so as to form a pair of jaws that snap into a groove 25^a in the shaft 25 and thus lock said shaft in operative position. Openings 30 are formed in the guard 29 adjacent the rear end of same, as shown in Fig. 1, and each of the depending tail-pieces 9 on the handles 2^d is provided with a pin or integral projection 31 that coöperates with the openings 30 to lock the members A and B to the guard 29. The members A and B are so constructed that the handles 2^d thereon can only be depressed when said members are separated, and when the handle 2^d of one of said members is depressed, for example, the handle 2^d of the member A, the pin 31 on the depending tail-piece of said handle will project into one of the openings 30 in the guard 29, as shown in Fig. 4, and thus securely lock the member A to said guard. Consequently, the person using the holder whose fingers extend underneath the guard 29, can accurately control the movement of the member B and move it laterally toward and away from the member A. After the member B has been moved laterally back to its normal position and the handle 2^d of said member is depressed, the pin 31 on the depending tail-piece of said handle will enter the other opening 30 in the guard 29.

The means herein shown for elevating one of the handles 2^d when the other handle 2^d is depressed, consists of a transversely disposed tripping member 32 on the rear end of the shaft 25 that lies underneath forwardly projecting extensions 33 on the depending tail-pieces 9 of the handles 2^d, as shown in Figs. 3, 4 and 6. When the handle 2^d of the member A is depressed, the tripping member 32 occupies the position shown in Fig. 3. Thereafter, when the handle 2^d of the member B is depressed the extension 33 on the tail-piece 9 of said handle strikes against the tripping member 32 and oscil-

lates said member to the left, looking at Fig. 3, thereby causing the opposite end of said member to exert sufficient upward pressure on the tail-piece of the handle 2^d of the member A to raise said handle.

In order to eliminate the possibility of the members A and B accidentally releasing the needle during the operation of sewing with the holder, means is provided for securely locking the handle 2^d of the member that grips the needle and holding said handle in its depressed position when the coöperating needle-operating member is moving laterally toward and away from the member that grips the needle. The means herein shown for accomplishing this consists of notches 34 in the depending tail-pieces 9 of the handles 2^d which are so positioned that they will receive the segmental-shaped flanges 27 and 28 at certain periods in the operation of using the holder. When the member B is moved laterally toward the member A, as shown in Fig. 4, the segmental-shaped flange 27 on the handle 2^d of the member B enters the notch 34 in the depending tail-piece of the handle 2^d of the member A and thus securely locks the handle 2^d of the member A in its depressed position so that it will be impossible for the member A to release the needle until after the member B has been moved laterally back to its normal position. Likewise, when the member A is thereafter moved laterally toward the member B, whose handle 2^d had been previously depressed, the flange 28 of the member A enters the notch 34 in the tail-piece of the handle 2^d of the member B and thus securely locks said handle in its depressed position. While the members A and B are being moved laterally toward and away from each other it is impossible to depress the handle 2^d of the laterally moving member sufficiently to actuate the tripping member 32 on the shaft 25. This is due to the fact that the extensions 33 on the depending tail-pieces of the handle 2^d of the member A are so designed that they will ride over the segmental-shaped flanges 27 and 28 when the members A and B are moving laterally. For example, when the member B is moved laterally toward the member A, as shown in Fig. 4, the extension 33 on the depending tail-piece of the handle 2^d of the member B moves in an arc above the segmental-shaped flange 28 of the member A and thus effectively prevents the handle 2^d of the member B from being depressed. Likewise, when the member A is moving laterally toward the member B the extension 33 on the depending tail-piece of the handle 2^d of the member A travels in an arc over the segmental-shaped flange 27 of the member B.

While we have illustrated and described one embodiment of our invention, we wish it to be clearly understood that our invention is not limited to a needle-holder of the construction herein shown because our broad idea consists in a needle-holder or needle-actuating device that comprises two relatively movable members or parts which alternately grip the opposite end portions of the needle so as to enable the needle to be inserted into and drawn through the material or parts being sewed. Said members may be provided with any suitable means for gripping the needle, and various means may be employed for separating said members or moving them apart so as to arrange them in position to receive the needle preparatory to the act of gripping the needle.

In using the device the needle C is first arranged in operative position between the needle-clamping jaws of the members A and B, as shown in Fig. 1, and the handle 2^d of the member A is thereafter depressed so as to firmly grip the eye portion of the needle, the end of the needle abutting against the shoulder 4^a on the jaw 4 of the member A, as shown in Fig. 2. If the holder is to be introduced into a cavity or through an incision the members A and B are left in their normal, separated position so that the member B will protect the point of the needle. The end of the member B is placed against the organ or part that is to be sewed so as to properly position the needle, and thereafter said member B is moved laterally toward the member A, out of axial alinement with the needle, so as to uncover the point of the needle. The needle is then inserted through the parts to be sewed together by bodily moving the holder, as shown in Fig. 13, and after the point of the needle is passed through the parts, the member B is moved laterally back to its normal position so as to cover the point of the needle and prevent it from accidentally sticking into the patient. The handle 2^d of the member B is then depressed so as to firmly grip the point portion of the needle and automatically release the eye portion of the needle and thereafter the member A is moved laterally toward the member B, as shown in Fig. 14, so as to uncover the eye portion of the needle. Thereafter, the holder is moved bodily, as shown in Fig. 15, so as to draw the needle through the material and complete the stitch. Before the next stitch is taken the member A is moved laterally back to its normal position and the handle 2^d of said member A is depressed so as to grip the eye portion of the needle and automatically release the point portion so that the member B can be moved laterally away from the point of the needle.

From the foregoing it will be seen that our improved needle-holder is so designed that there is no liability of the needle accidentally sticking into the patient or into

the hand of the surgeon during the operation of sewing with the device; it is not necessary for the surgeon to use his finger to protect the point of the needle when the device is being introduced into a cavity or after the needle has passed through the parts being sewed.

The device can be manipulated with one hand, thus overcoming the necessity of employing an assistant, and also greatly reducing the time required to sew up a wound or cut. A surgeon of only ordinary skill can sew up a wound or cut skilfully with the device, and as the device comprises members that alternately grip the opposite end portions of the needle there is no danger of breaking the needle during the operation of using the holder.

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

1. A needle-holder comprising an eye portion gripping member, a point portion gripping member that surrounds or embraces the point of the needle when said members are separated and in normal position with relation to each other, and means for holding said members separated so as to protect the needle point when the holder is being arranged in operative position.

2. A needle-holder comprising coöperating means for alternately gripping the opposite end portions of the needle, said means being adapted to be moved toward each other to uncover one end or the other of the needle and one of said means having a portion that protects the point of the needle when said means are separated, and means for holding said means separated when the holder is being arranged in proximity to the part to be sewed.

3. A needle-holder comprising a device for protecting the point of the needle after it has passed through the part into which it was inserted, and a device for supporting and manipulating the needle, said devices comprising means whereby the protecting device can be moved toward said supporting device out of longitudinal alinement with the needle to uncover the point of the needle.

4. A needle-holder comprising means for gripping the eye portion of the needle so as to enable the needle to be inserted in the part to be sewed, and means for gripping the point portion of the needle so as to enable the needle to be drawn through said part, said means being normally separated and positioned at the opposite ends of the needle and adapted to be moved toward each other to uncover one or the other end of the needle.

5. A needle-holder comprising relatively movable needle-operating members that are adapted to alternately grip the opposite end portions of the needle during the operation of sewing with the needle, said members being normally positioned at the opposite ends of the needle and designed in such a manner that they both lie at the same side of that end of the needle which is free or uncovered during the sewing operation.

6. A needle holder, comprising relatively movable needle-operating members that are adapted to alternately grip the opposite end portions of the needle during the operation of sewing with the needle, one of said members having a portion that protects one end portion of the needle when the opposite end portion of the needle is gripped by the cooperating member, and a connection between said members which causes the member that is released from the needle to move out of axial alinement with the path of travel of the needle when said members are moved relatively to each other, thus preventing either member from ever being positioned in front of the needle during the operation of inserting the needle.

7. A needle-holder comprising needle-operating members which are normally positioned adjacent the opposite end portions of the needle, and needle-clamping means on said members, said members being adapted to be moved toward each other so as to uncover one or the other end portion of the needle during the operation of sewing with the needle.

8. A needle-holder comprising coöperating needle-operating members which are adapted to alternately grip the opposite end portions of the needle during the operation of sewing with same, and means for causing one of said members to automatically release the needle when the other member grips the needle, said members being normally positioned adjacent the ends of the needle and adapted to be moved toward each other within practically the length of the needle to uncover one or the other end of the needle.

9. A needle-holder comprising a pair of needle-operating members arranged approximately parallel to each other and each provided with a needle-clamping means, and means for normally holding said members separated a distance approximately equal to the distance between the eye and the point of the needle so as to normally project the opposite ends of the needle, said members being adapted to be moved toward and away from each other alternately within practically the length of the needle during the operation of sewing with the device.

10. A needle-holder comprising coöperating needle-operating members each of which is provided with means for gripping and holding a needle, said members being normally positioned adjacent the opposite ends of the needle and adapted to be moved toward each other to uncover one or the other

end of the needle, and means whereby one or the other of said members always grips the needle when the device is being used.

11. A needle-holder comprising coöperating needle-operating members that are normally positioned adjacent the opposite end portions of the needle and which are adapted to be moved toward each other to uncover one end or the other of the needle, needle-gripping means on said members, and means on said members for locking the needle-gripping means on one of said members in operative position when the other member is being moved into position to uncover one end portion of the needle, thereby preventing the needle from being released accidentally from one of said members when the other member is not in its normal position to receive the needle.

12. A needle-holder comprising coöperating needle-operating members that are normally positioned adjacent the opposite end portions of the needle and which are adapted to be moved toward each other to uncover one end or the other of the needle, needle-gripping means on said members, means on said members for locking the needle-gripping means on one of said members in operative position when the other member is being moved into position to uncover one end portion of the needle, thereby preventing the needle from being released accidentally from one of said members when the other member is not in its normal position to receive the needle, and means whereby the act of releasing one end of the needle causes the opposite end of the needle to be gripped automatically.

13. A needle-holder comprising a pair of approximately parallel arranged needle-operating members mounted in such a manner that each can be moved laterally toward and away from the other, needle-clamping means on said members, means for normally holding said members separated so that the needle-clamping means on same are located adjacent the opposite end portions of the needle, independent means on said members for causing the needle-clamping means on same to grip the needle, and means whereby a single operation of the user causes one end of the needle to be clamped and the opposite end of the needle to be released.

14. A needle-holder comprising a pair of needle-operating members mounted in such a manner that they can be oscillated toward and away from each other about an axis extending parallel to said members, and means for causing one of said members to grip one end of the needle while the other member is acting to protect the opposite end of the needle.

15. A needle-holder comprising coöperating needle-operating members that are normally positioned adjacent the opposite end portions of the needle and which are adapted to be moved toward each other to uncover one end or the other of the needle, movable needle-clamping devices on said members arranged so that one or the other of same will normally be operative, and means on said members for positively locking the operative needle-clamping device in such a position that it cannot be released when the member that carries the inoperative needle-clamping device is being moved into position to uncover one end of the needle.

16. A needle-holder comprising a pair of relatively movable needle-operating members that are adapted to be moved toward and away from each other, needle-clamping means on said members, means which tends to separate said members and normally hold the needle-clamping means on same positioned at the point and eye portions of the needle, means for causing the needle-clamping means on one of said members to release the needle when the needle-clamping means on the other member grips the needle, and means for preventing the needle from being released from the clamping means that grips same when the other member is being moved into position to uncover one end of the needle.

17. A needle-holder comprising a pair of relatively movable needle-operating members that are adapted to be moved toward and away from each other within practically the length of the needle, needle-clamping means on said members, means which tends to separate said members so as to normally hold the needle-clamping means on same in proximity to the point and eye portions of the needle, means for causing the needle-clamping means on one of said members to release the needle when the needle-clamping means on the other member grips the needle, and means for preventing the member that clamps the needle from being actuated so as to release the needle when the other needle-operating member is not operative for receiving the needle.

18. A needle-holder comprising a pair of relatively movable needle-operating members, each of which is provided with means for gripping a needle, a guard or handpiece that is adapted to be grasped by the hand of the user, and means for alternately locking said members to said guard when the device is in use.

19. A needle-holder comprising a pair of relatively movable needle-operating members that are adapted to be moved toward and away from each other, a guard or handpiece that is adapted to be gripped by the hand of the user, a movable needle-clamping device on each of said members, and means

controlled by said devices for locking the guard to one or the other of said needle-operating members.

20. A needle-holder comprising a pair of coöperating members provided with needle-holding means, a pivot on which said members are oscillatingly mounted, means that tends to force said members apart, and co-operating means on said members that limit the lateral movement of said members with relation to each other so as to position the needle-holding means on said members adjacent the opposite ends of the needle, said members being adapted to be brought together during the sewing operation so as to uncover one or the other end of the needle.

21. A needle-holder comprising a pair of relatively movable needle-operating members provided with needle-holding means, said members being adapted to be moved toward each other during the operation of sewing with the holder so as to uncover one or the other end of the needle, and away from each other so as to grip one or the other end of the needle, means which tends to force said members apart, and coöperating stops on said members that limit the lateral movement of same with relation to each other so as to position the needle-holding means on said members at the opposite ends of the needle.

22. A needle-holder comprising a pair of needle-operating members, each of which consists of a stationary part and a movable part provided with coöperating needle-gripping means, means for pivotally connecting the stationary parts of said members together so that said members can be oscillated toward and away from each other, said members being separated prior to the insertion of the needle and after the needle has been drawn through the part being sewed and being arranged together when the needle is being inserted and when it is being drawn through the parts, and means co-operating with the movable parts of said members for securely locking said parts in position to clamp the needle during certain movements of the device.

23. A needle-holder comprising a pair of needle-operating members, each of which consists of a stationary part and a movable part provided with coöperating needle-gripping jaws, a sliding connection between the movable and the stationary parts of each of said members, links that pivotally connect the coöperating stationary and movable parts of said members together, and a connection between the stationary parts of said members that enables one of said members to be moved laterally toward and away from the other.

24. A needle-holder comprising a pair of needle-operating members, each of which consists of a stationary part provided with a handle and a needle-clamping jaw and a movable part provided with a handle and a coöperating needle-clamping jaw, means for causing said jaws to clamp the needle when the handle of said movable part is depressed, and means whereby the depression of the handle of one of said movable parts causes the handle on the movable part of the other member to raise automatically so as to release the needle.

25. A needle-holder comprising a pair of relatively movable needle-operating members that are adapted to be moved toward and away from each other, needle-clamping means on each of said members comprising an operating handle, and a tripping member that coöperates with said operating handles to raise the handle of one member when the handle of the other member is depressed, thereby causing one end of the needle to be released when the opposite end of the needle is gripped.

26. A needle-holder comprising a pair of relatively movable needle-operating members, each of which is provided with a needle-gripping means that comprises an operating handle, said members being adapted to be moved laterally toward and away from each other, and means on said members that cause the handle of the member that grips the needle to be locked when the other member is being moved toward and away from said member.

27. A needle-holder comprising a pair of relatively movable needle-operating members, each of which is provided with a needle-gripping means that comprises a handle that is adapted to be actuated so as to clamp the needle, a shield or hand-piece that is adapted to be grasped by the hand of the user, and means controlled by the handles of said needle-operating members for locking said members to said shield alternately during the operation of sewing with the holder.

28. A needle-holder comprising a pair of relatively movable needle-operating members, each of which consists of a stationary part and a movable part provided with co-operating needle-gripping portions, a link pivotally connected to said stationary and movable parts for connecting them together, and a spring for separating the needle-gripping portions on said parts when the movable part is released.

29. A needle-holder comprising a pair of relatively movable needle-operating members, each of which consists of a stationary part and a movable part provided with co-operating needle-gripping portions, a link pivotally connected to said stationary and movable parts for connecting them together, a spring for separating the needle-gripping

portions on said parts when the movable part is released, and a tripping member arranged in such a manner that when the movable part of one of said members is actuated to clamp the needle the movable part of the other member will be actuated to automatically release the needle.

30. A needle-holder comprising a pair of needle-operating members, each of which consists of a stationary part and a movable part provided with coöperating needle-gripping portions, a shaft arranged longitudinally between said members and mounted in bearings on the stationary parts of said members, yielding means that tends to force said members apart, coöperating segmental-shaped flanges on the stationary parts of said members that limit the lateral movement of said members with relation to each other, and means whereby the flange on one of said members acts to lock the movable part of the other member in position to clamp the needle.

31. A needle-holder comprising a pair of needle-operating members, each of which consists of a stationary part and a movable part provided with coöperating needle-gripping jaws, means for pivotally connecting the stationary parts of said members together so that said members can be moved laterally toward and away from each other in an arc, a handle on the movable part of each of said members, and a locking device on the stationary part of each of said members that is adapted to coöperate with the handle on the movable part of the other member.

32. A needle-holder comprising a pair of needle-operating members, each of which consists of a stationary part and a movable part provided with coöperating needle-gripping jaws, means for pivotally connecting the stationary parts of said members together so that said members can be moved laterally toward and away from each other in an arc, a handle on the movable part of each of said members, a locking device on the stationary part of each of said members that is adapted to coöperate with the handle on the movable part of the other member, a guard or hand-piece that is adapted to be grasped by the fingers of the operator, and means on said handles for locking said guard to the operating member in which the needle is gripped.

33. A needle-holder comprising a pair of relatively movable needle-operating members, coöperating needle-gripping jaws on said members, a shoulder on one of said jaws that forms an abutment for the eye end of the needle, and means whereby the act of gripping the point portion of the needle tends to force the eye end of the needle toward said abutment.

34. A needle-holder comprising a guard or hand-piece that is adapted to be grasped by the fingers of the operator, a shaft extending longitudinally of said guard through wings on same, a pair of needle-operating members oscillatingly mounted on said shaft, a movable needle-clamping part on each of said members having a handle portion provided with a depending tail-piece, a toggle link fitting in a vertically-disposed slot in the tail-piece of each of said movable parts and provided with a half trunnion that projects transversely through an opening communicating with said slot, wings that embrace the opposite end of said toggle link, a removable pin that passes through said wings and toggle link, a second toggle link connected at one end to said handle and acting upon said pin to retain it in position, and a coiled expansion spring on said second toggle link arranged between said handle and a stop on said handle.

35. A needle-holder comprising a hand-piece that is adapted to be grasped by the hand of the user, a pair of needle-operating members combined with said hand-piece and mounted in such a manner that they can be moved toward and away from each other and also moved with relation to said hand-piece, and means for locking one of said members to the hand-piece when the other member is free to be moved.

36. A needle-holder comprising relatively movable needle-operating members that alternately grip the opposite end portions of the needle and which move out of axial alinement or longitudinal alinement with the path of travel of the needle during the operation of sewing with the needle.

37. A needle-holder comprising relatively movable needle-operating members that alternately grip the opposite end portions of the needle and which move out of axial alinement or longitudinal alinement with the path of travel of the needle during the operation of sewing with the needle, needle-clamping means on each of said members, and means for causing the needle to be released automatically from one of said members when the other member clamps the needle.

38. A needle-holder comprising needle-operating members provided with portions which are normally positioned adjacent the opposite end portions of the needle so as to protect both ends of the needle, and means whereby said members are adapted to be moved out of axial alinement or longitudinal alinement with the needle during the operation of sewing with the needle.

39. A needle-holder comprising coöperating needle-operating members each of which is provided with means for gripping and holding a needle, and means whereby one of said members can be moved out of axial alinement or longitudinal alinement with the

Correction in Letters Patent No. 1,131,163.

It is hereby certified that in Letters Patent No. 1,131,163, granted March 9, 1915, upon the application of Edward W. Saunders and Edwin H. Steedman, of St. Louis, Missouri, for an improvement in "Surgical Needle-Holders," an error appears in the printed specification requiring correction as follows: Page 7, lines 118–119, for the word "project" read *protect;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of April, A. D., 1915.

[SEAL.]

J. T. NEWTON,

Acting Commissioner of Patents.

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