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R. B. KURTZ

1,973,569

SURGICAL INSTRUMENT

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Fig. 2.

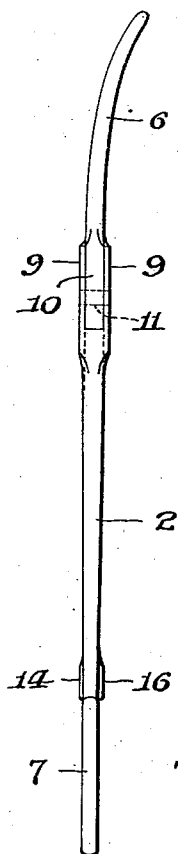


Fig. 1.

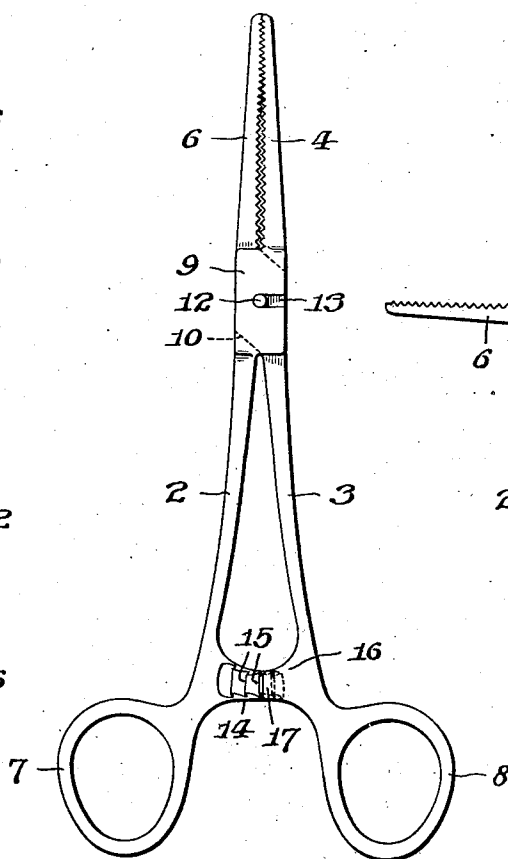


Fig. 3.

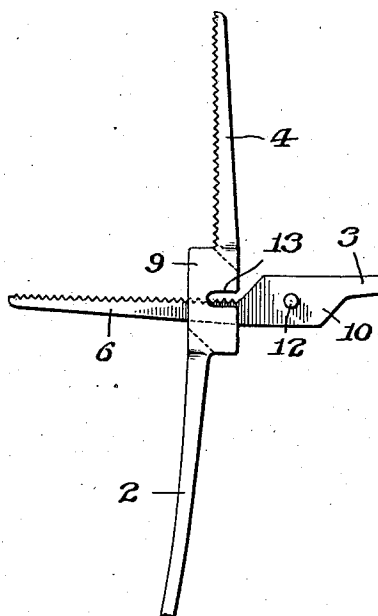


Fig. 4.

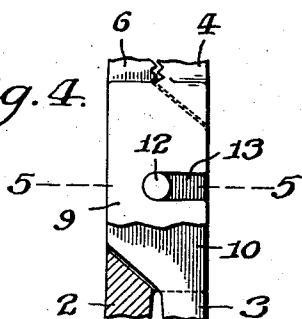
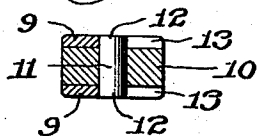


Fig. 5.



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UNITED STATES PATENT OFFICE

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SURGICAL INSTRUMENT

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4 Claims. (Cl. 128—321)

This invention relates to improvements in surgical instruments of the type which comprises two relatively movable members pivotally connected and provided with cooperating jaws or other parts on one end portion thereof and opposing handles on the other end portion thereof by means of which the jaws or parts may be moved toward or from each other, such, for example, as forceps of various kinds.

The object of the invention is to provide a novel, simple and efficient means for pivotally connecting the two members of the instrument in a manner which permit them to be easily and quickly put together or assembled into operative relationship and just as easily and quickly disassembled or completely separated for the purposes of cleaning and sterilization and for other purposes.

With the foregoing and related objects in view, the invention consists in the novel construction, combination and arrangement of parts hereinafter described and claimed.

In the accompanying drawing, illustrating the invention,

Figure 1 is a front view of a surgical instrument, showing one form of embodiment of the invention.

Figure 2 is a side view thereof.

Figure 3 is a view of portions of the two members of the instrument, showing relative positions thereof at one stage of the operation of assembling or disassembling them.

Figure 4 is a front view, enlarged and partly in section, of the pivotally connected portions of the two members of the instrument.

Figure 5 is a sectional detail, on line 5—5 of Fig. 4.

Referring to the drawing, the instrument comprises two members 2 and 3 having opposing, cooperating parts or jaws 4 and 6 formed on one end portion thereof and opposing handles 7 and 8 formed on the other end portion thereof, respectively.

The jaw 4 is connected to the main body of its member 2 by two spaced parallel walls 9, 9, and the jaw 6 is connected to the main body of its member 3 by a widened portion 10 which is located between the walls 9, 9 when the members 2 and 3 are assembled.

The thickness of the widened portion 10 of the member 3 is substantially equal to the space between the walls 9, 9 of the member 2, so that the contacting surfaces of the portion 10 and the walls 9, 9 will maintain the jaws 4 and 6 and handles 7 and 8 in proper working relation

and preserve the alinement of the jaws and the handles when they are moved toward and from each other, as will be presently explained.

The widened portion 10 of the member 3 is provided with a pin 11 which is forced into and through a bore in the portion 10 and thereby firmly held in place therein. The respective end portions of the pin 11 extend outwardly from the portion 10 and constitute pivot projections 12, 12 for the member 3. These pivot projections 12, 12 extend into oppositely disposed slots 13, 13 formed in the walls 9, 9. The slots 13, 13 have open ends at one side of the walls 9, 9, and they extend from their open ends to the central portion of the walls 9, 9 and have closed inner ends which embrace and are fitted to the pivot projections 12, 12 and form bearings therefor, and thereby pivotally connect the two members 2 and 3 in a manner to permit them to pivot on the axis of the projections 12, 12 for the opening and closing of the jaws 4 and 6 when the handles 7 and 8 are moved from and toward each other.

It will be observed that the walls 9, 9 are of oblong shape and that the jaw 4 and the body of the member 2 extend from diagonally opposite corners of the walls 9—9, and also that the jaw 6 and the body of the member 3 extend from the opposite diagonal corners of the walls 9, 9 and also that the ends of the slots 13, 13 are open at the side of the walls 9, 9 which carry the jaw 4. This arrangement of the parts causes any inward pressure on the handles 7 and 8, which forces the jaws 4 and 6 toward each other and into engagement with any thing or object placed between them, to tend to move the pivot projections 12, 12 toward the closed end of the slots 13, 13 and thus keep them in proper pivotal working engagement therewith when the instrument is in service.

The member 2, adjacent to its handle 7, is provided with an arm 14 which extends toward the member 3 and has a series of teeth 15 thereon, and the member 3, adjacent to its handle 8, is provided with an arm 16 which extends toward the member 2 and has a hook 17 formed on its free end and adapted to be engaged with any one of the teeth 15 to hold the instrument in a closed position or in different positions with its jaws in engagement with an object or thing held between them, the members 2 and 3 having sufficient resilience to permit the hook 17 to be sprung into and out of engagement with the teeth 15, as is common in instruments of this general character.

When it is desired to separate the members 2 and 3 for cleaning and for sterilization and for any other purpose, it is merely necessary to move the handles 7 and 8 apart until the jaws 4 and 6 have been opened fairly wide and then move the member 3 to withdraw the pivot projections 12, 12 from within the slots 13, 13 and to draw the jaw 6 into the opening between the walls 9, 9 as shown in Fig. 3, and, thereafter, continue the movement of the member 3, until the jaw 6 has been withdrawn from within the opening between the walls 9, 9 and the members or parts have been completely separated or disassembled. The two members of the instrument may now be easily washed and completely sterilized, and, thereafter, they may be easily and quickly put together or reassembled by a reversal of the disassembling operation just described.

In order to prevent the pivot projections 12, 12 from accidentally leaving the slots 13, 13 with the consequent accidental separation of the members 2 and 3, I form the slots 13, 13 so that the end portions thereof, near their open ends, are slightly narrower than the diameter of the pivot projections 12, 12, and I form the walls 9, 9 sufficiently thin to provide sufficient resilience to permit the opposing walls of the open end portions of the slots 13, 13 to be sprung apart to permit the projections 12, 12 to be forced into and from within the slots with a reasonable and suitable amount of pressure when the members 2 and 3 are assembled and disassembled, as previously explained.

The opposing walls of the jaws 4 and 6 are serrated and the instrument herein illustrated is made in the form of a hemostat. I desire it to be understood, however, that my invention is not limited to an instrument of this particular character and that it is applicable to all kinds of forceps and analogous instruments.

I claim as my invention:

1. In a surgical instrument, two relatively movable members having opposing jaws on one end portion thereof and opposing handles on the other end portion thereof, one of said members having an opening extending therethrough and formed between spaced walls which connect its jaw to its main body, and the other of said members extending through said opening, and its jaw being constructed to be moved therethrough for assembling and disassembling the members, one of said walls having a slot therein closed at one end thereof and open at the other end thereof, the member extending between said walls and having a pivot projection extending therefrom and into said slot for pivotally connecting the members, said projection being movable from within the slot for permitting the separation of the members, the closed end portion of the slot being substantially as wide as the diameter of the projection, the open end portion of the slot being narrower than the diameter of the projection to prevent accidental displacement of the projection from within the slot, and the wall forming the slot being constructed to yield to permit the projection to enter and leave the slot.

2. In a surgical instrument, two relatively movable members having opposing jaws on one end portion thereof and opposing handles on the other end portion thereof, one of said members having an opening extending therethrough and formed between spaced walls which connect its jaw to its main body, and the other of said members extending through said opening, and its jaw being constructed to be moved therethrough for assembling and disassembling the members, said walls having oppositely disposed aligned slots therein open at one end thereof and closed at the other end thereof, the member extending between said walls having aligned pivot projections extending fixedly from opposite surfaces thereof and into said slots for pivotally connecting the members, and said projections being movable from within the slots for permitting the separation of the members.

3. In a surgical instrument, two relatively movable members having opposing jaws on one end portion thereof and opposing handles on the other end portion thereof, one of said members having an opening extending therethrough and formed between spaced walls which connect its jaw to its main body, and the other of said members extending through said opening, and its jaw being constructed to be moved therethrough for assembling and disassembling the members, and means pivotally connecting the members when assembled, said walls having oppositely disposed slots therein open at one end thereof and closed at the other end thereof, the member extending between said walls having pivot projections extending into said slots for pivotally connecting the members, said projections being movable from within the slots for permitting the separation of the members, the closed end portions of the slots being substantially as wide as the diameter of the projections, the open end portions of the slots being narrower than the diameter of the projections to prevent accidental displacement of the projections from the slot, and the walls forming the slots being constructed to yield to permit the projections to enter and leave the same.

4. In a surgical instrument, two relatively movable members having opposing jaws on one end portion thereof and opposing handles on the other end portion thereof, one of said members having an opening extending therethrough and formed between spaced walls which connect its jaw to its main body, and the other of said members extending through said opening, and its jaw being constructed to be moved therethrough for assembling and disassembling the members, said walls having oppositely disposed aligned slots therein open at one end thereof and closed at the other end thereof, the member extending between said walls having a transverse pin extending therethrough and fixedly relating thereto and having its respective end portions projecting from opposite surfaces thereof and into said slots for pivotally connecting the members, and the projecting end portions of the pins being movable from within the slots for permitting the separation of the members.

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