

C. DEDERER.
SURGICAL FORCEPS.
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1,356,048.

Patented Oct. 19, 1920.

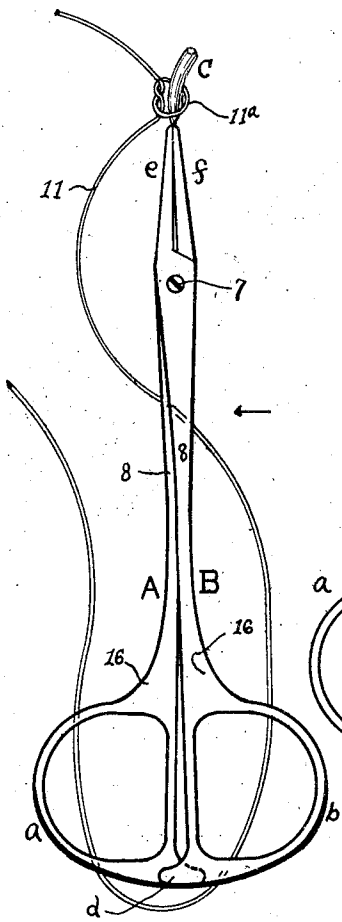


Fig. 1.

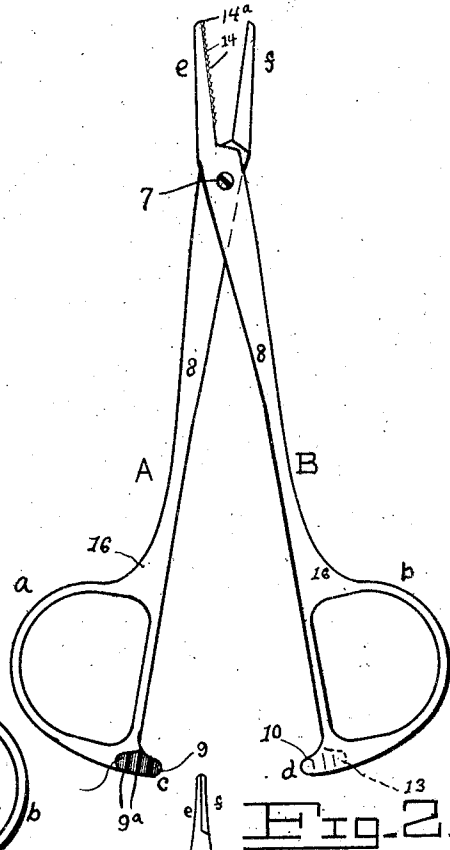


Fig. 2.

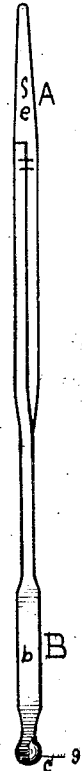


Fig. 3.

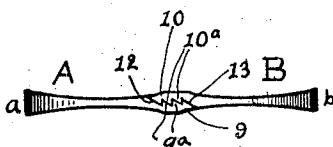


Fig. 4.

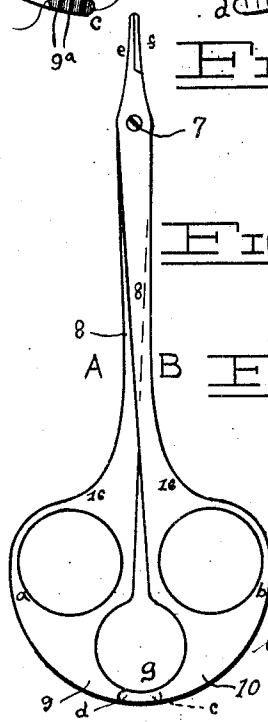
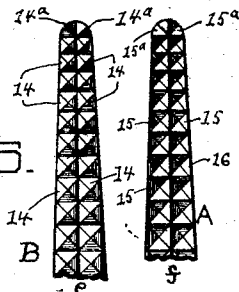


Fig. 5.



INVENTOR,
Carleton Dederer
by Alfred H. Daehler,
HIS ATTORNEY

WITNESSES:
H. Van Upp
J. B. Hatcher

UNITED STATES PATENT OFFICE.

CARLETON DEDERER, OF LOS ANGELES, CALIFORNIA.

SURGICAL FORCEPS.

1,356,048.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CARLETON DEDERER, surgeon, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Surgical Forceps, of which the following is a specification.

This invention relates to surgical forceps and more particularly to surgical forceps or clamps for arteries, tissues and the like. Clamps for arteries and tissues as ordinarily constructed frequently cause trouble, inconvenience and loss of time during surgical operations due to the cat-gut or other ligatures used in tying up arteries, tissues and the like, becoming entangled with or caught in or about some portion of the forceps handle, and frequently where large numbers of such forceps are used in one field of operation, some of the forceps will fall into and catch in the crotch between the handle members of other forceps adding to the inconvenience and annoyance caused the operator by the entanglement or catching of the ligature or ligatures by the handles of the forceps. The manner of use of artery and tissue forceps or clamps necessitates the provision of a finger or thumb receiving ring on each handle member, so that the forceps may be manipulated with proper delicacy in applying the same to bleeding tissues or arteries where they are left in clamped position while other matters pertaining to the operation in hand are attended to, then, one by one the operator ties a ligature around a vessel while still held by its respective clamp, after which the clamp may be released by the operator by placing a finger and thumb each in a handle member ring and properly manipulating the handle members to unlatch them.

In ordinary forms of artery and tissue forceps or clamps the requisite finger and thumb receiving rings are joined to or formed on their respective handle members in such manner that the ligatures will catch in the crotch formed at such junctures as well as in the crotch between the two handle members of each forceps.

The present invention has for its object to provide an improved device of the general character stated which will be relatively simple and inexpensive in construction when its other features of superiority and increased efficiency are considered, in which the objec-

tionable features hereinbefore mentioned are eliminated and which will be generally superior in point of serviceability.

With the above and other objects in view the invention consists in the novel and useful provision, formation, construction and relative arrangement of parts, members and features, all as hereinafter described, shown in the drawing and finally pointed out in claims.

In the drawing:

Figure 1 is a side elevation of an improved surgical forceps or clamp, constructed in accordance with the invention, the same being shown in clamping position as applied to an artery while a ligature is being tied around the artery;

Fig. 2 is a side elevation of the improved forceps in open position;

Fig. 3 is an edge elevation looking in the direction of the arrow in Fig. 1, the showing of the artery and ligature being omitted from this figure;

Fig. 4 is an end view of the handle members of the improved forceps;

Fig. 5 is an enlarged fragmentary showing of the preferred jaw formation, the inside or holding portion of each jaw being illustrated, the jaws being shown as broken away and in detached position; and,

Fig. 6 is a view similar to Fig. 1 of a modified form of surgical forceps.

Corresponding parts in all the figures are designated by the same reference characters.

Referring with particularity to the drawing the improved surgical forceps therein shown comprises two matched members A and B pivotally connected as at 7 and provided with integral finger receiving rings *a* and *b* and overlapping latch portions *c* and *d*, respectively, at one end of the forceps, matched jaws *e* and *f* being formed at the other end of the forceps. Each of the members A and B comprises a shank or lever 8 from which springs outwardly at one end thereof the respective finger receiving ring *a* or *b*, the longitudinal axis of the shank 8 being preferably approximately straight. The latch member *c* comprises an inwardly extending finger 9 provided at the ring end of the member A and the latch member *d* comprises a similar inwardly extending finger 10 provided at the ring end of the member B, such fingers 9 and 10 being adapted to overlie each other and to mutually engage to prevent

entrance of the ligature, shown at 11 in Fig. 1, to the space between the handle members, the latching engagement being secured by the provision of ratchet teeth 9^a and 10^a on the fingers 9 and 10, respectively. The members A and B are recessed as at 12 and 13, respectively, to accommodate the extreme end of the fingers 9 and 10, respectively, and when the ratchet teeth on such fingers are mutually engaged and the finger ends are seated in the recesses 12 and 13 a resulting smooth surface is provided at both sides of the junction of the members A and B.

On the inner face of the member B at its jaw end *e*, are provided a plurality of pyramidal projections 14, preferably arranged in two diverging longitudinally ranging series, the first of such projections 14^a in each series, that is to say the two projections at the tip of the jaw are formed with their apices at the extreme biting end of the jaw. The inner face of the member A, at its jaw end *f*, is formed to match and accommodate the pyramidal projections 14^a on the jaw end *e* of the member B, a plurality of polyhedral depressions 15 being formed therein, disposed in two diverging longitudinally ranging series. The two depressions 15^a at the extreme jaw tip accommodating the projections 14^a on the member B open outwardly through the end of the jaw tip.

The pivot 7 uniting the members A and B is preferably a screw which may be riveted or headed after the parts have been assembled. An artery is designated by C, and a knot being tied in the ligature is shown at 11^a, Fig. 1.

Where each ring *a* or *b* is joined to its respective shank or lever 8, a guard formation 16 is provided to give a gradual change in direction of the surface extension and to occlude the acute angle ordinarily found in forceps of standard construction, and the shank, ring, jaw and other features of each of the members being preferably integral, the joining of the ring *a* or *b* to the respective shank or lever 8 by the guard formation 16 results in continuity of structure having a tapering outline, and the ligature will easily climb or ride over the handle members of the forceps, when pulled upon, instead of catching in a crotch as it would in the ordinary form of forceps of this general nature.

The fingers 9 and 10 being placed at one extreme end of the handle members and being curved at their outward edges give a circular or elliptic outline to the handle at its end, when the handle members A and B are snapped together as shown in Figs. 1 and 6.

In the modified form of construction shown in Fig. 6 I provide a third finger

hold *g*, formed in part by the inwardly extending fingers 9 and 10 and in part by the rings *a* and *b*. The extending fingers 9 and 10 in this form of construction are enlarged and curved outwardly much more than the fingers shown in the other figures, overlapping to form a continuous arc, the fingers being provided with ratchet teeth similar to the teeth 9^a and 10^a shown in Figs. 2 and 4.

The operation, method of use and advantages of the improved surgical forceps will be readily understood from the foregoing description, taken in connection with the accompanying drawing and the following statement:

To apply the forceps or clamp to bleeding tissues, arteries or the like, the operator places the tip of a thumb in one of the rings *a* or *b* and the tip of a finger in the other rings *a* or *b*, the forceps or clamp then being gently applied to the artery or the like by giving the jaws the proper bite and snapping the ratchet teeth 9^a and 10^a provided on the fingers 9 and 10, respectively, together, such closing being readily permitted by the springiness of the long slender shank formation, the shanks 8 having the necessary inherent resiliency to permit of a slight torsional as well as lateral deflection as the ratchet teeth 9 and 10 ride over each other, sufficient resiliency also being provided for in such shanks to maintain a proper pressure on the artery or tissue being clamped after the fingers 9 and 10 are snapped together. While the forceps or clamp is still applied to the tissues or artery the ligature is tied, as illustrated in Fig. 1, all possible danger of entanglement of ligature and forceps or a forceps with an adjacent forceps being eliminated. As elimination of waste time is the deciding factor in many operations the advantages of the improved forceps or clamp are apparent. After each ligature is tied, the respective forceps may be removed by inserting thumb and finger tips each in a ring *a* or *b* and giving a slight torsional and lateral movement to each ring and its respective connected finger 9 or 10 to disengage the ratchet teeth on such fingers, and while the ratchet teeth are so held out of engagement the forceps may be opened as shown in Fig. 2 and removed.

In the modified form of construction shown in Fig. 6, the provision of the third finger hold enables the operator to more delicately aim and place the forceps, as with thumb and forefinger tips inserted in the rings *a* and *b*, and a middle finger tip inserted in the hold *g* the tips of the forceps jaws at the ends of the long shanks or levers 8 may be accurately guided to the desired spot. The shanks or levers 8 overlies each other for a considerable distance when the device is closed, or nearly closed, so as to

provide a slender instrument for a great portion of its length, in order to reach places inaccessible with a broad instrument.

Having thus disclosed my invention I claim and desire to secure by Letters Patent:

1. A surgeon's forceps comprising shanks having finger rings at one end and jaws at the other, the outer surfaces of said shanks and finger rings at and near their junction being a curved continuous line and on their inner surfaces a substantially straight line.

2. A surgeon's forceps comprising handle members having shanks provided with finger rings and jaws, the peripheral surfaces of the finger rings at both edges of the same at and near their junction with their respective shanks having a smooth continuous face for presentation to adjacent contacting objects and whereby holding engagement with such contacting objects is prevented.

3. A device comprising a pair of opposed members adapted to be manipulated one by the thumb, and the other by a finger opposed thereto, said members being formed to mutually overlap at one end of the device to prevent the intrusion and catching of adjacent objects therebetween and having interconnected portions; said members having thumb and finger engagement means, one of said means being provided on one of said members and the other of said means being provided on the other of said members; said means being formed on said members between the overlapping ends and the interconnected portions thereof, and all of the

exposed peripheral surfaces of said means at and near their junction with the remaining portions of the respective members having continuous smooth faces for presentation to adjacent contacting objects and whereby holding engagement with such contacting objects is prevented.

4. A device comprising a pair of opposed members adapted to be manipulated one by the thumb and the other by a finger opposed thereto, said members being formed to mutually overlap at one end of the device to prevent the intrusion and catching of adjacent objects therebetween and having interconnected portions; said members having thumb and finger engagement means, one of said means being provided on one of said members and the other of said means being provided on the other of said members; said means being formed on said members between the overlapping ends and the interconnected portions and at the outer edges thereof and the peripheral surfaces of said means at and near their junction with the remaining portions of the respective members having a continuous smooth face for presentation to adjacent contacting objects and whereby holding engagement with such contacting objects is prevented.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARLETON DEDERER.

Witnesses:

FRANCIS L. ISGRIGG,
ALFRED H. DOEHLER.