

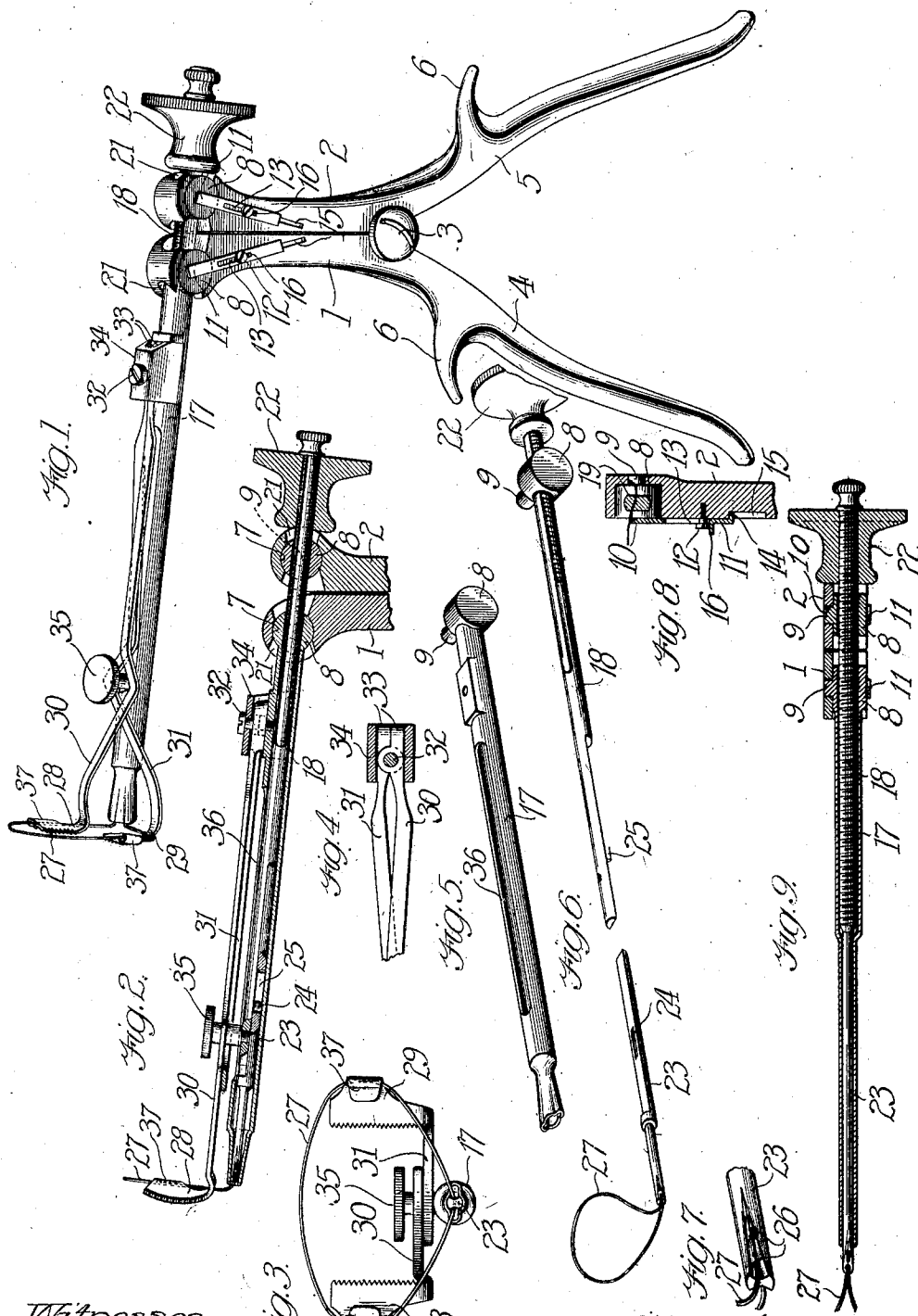
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SURGICAL INSTRUMENT.

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SURGICAL INSTRUMENT.

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To all whom it may concern:

Be it known that we, FREDERICK R. MUELLER and LOUIS REHTHALER, citizens of the United States of America, and residents of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Surgical Instruments, of which the following is a specification.

The main objects of this invention are to provide an improved form of surgical instrument particularly adapted for such operations as the removing of tonsils, adenoid tissue and other growths from the passage connecting the nose and throat; to provide an instrument of this kind with means operated simultaneously with the cutting member for gripping the growth; to provide in an instrument of this kind means for causing the relative movement of the operating parts independent of the movement of the handles; and to provide an improved construction whereby operating parts may be interchangeably attached to the handles.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:—

Figure 1 is a perspective view of a surgical instrument constructed according to this invention. Fig. 2 is a longitudinal sectional detail of the operating parts. Fig. 3 is an enlarged end view of the operating parts. Fig. 4 is a detail view, showing the method of securing the arms which carry the gripping jaws. Fig. 5 is a detail in perspective of the tubular members. Fig. 6 is a detail of the telescoping rod. Fig. 7 is a detail showing the method of attaching the wire filament. Fig. 8 is a fragmentary section of the end of one of the levers showing the spring clips which secure the operating parts on the levers. Fig. 9 is a longitudinal sectional view of the operating members when used as a snare only.

By operating parts is meant the telescoping members and the means carried thereby for removing and gripping the growth.

In the specific construction shown in the drawings, the levers 1 and 2 are pivoted together at 3 intermediate of their ends so as to form handles 4 and 5, which have ears 6 integrally formed thereon to prevent slipping of the instrument in the hands. In the opposite ends of the levers 1 and 2 are formed cylindrical sockets 7 extending inward from one face of the levers, and in which are retained the trunnion parts 8.

Each of the parts 8 has a reduced trunnion 9 formed on one side, which registers with the aperture or bearing 10. The parts 8 are each held in place on the levers by a spring slide 11, which is secured thereto by screws 12, and the sliding movement thereof is limited by the slot 13. A lug 14 on the slide 11 coacts with a slot 15 in the levers, and keeps the slide from being displaced, the slide being moved by pressing on the finger 16.

The tubular member 17 is integrally formed on the part 8, carried by the lever 1, and the telescoping member or rod 18 extends through the slot 19 in the other part 8 carried by the lever 2. Transverse slots 21 allow for an angular movement of the members 17 and 18. The rod 18 is threaded, and carries the nut 22 outwardly of the lever 2, by means of which the members 17 and 18 may be moved relatively of each other, independently of the levers 1 and 2, for the purpose of adjustment. The rod 18 has an extension 23 which may, if desired, be integrally formed therewith, as shown in Fig. 9, or it may be a separate piece, having an elongated slot 24, with which a lug 25 on the rod 18 may register and allow for a small amount of relative movement where the instrument is equipped with gripping jaws. The extension 23 has two transverse eyes 26 formed in the end thereof, through which may be threaded the ends of a wire filament 27.

In order to grip the growth that is to be cut away, and prevent its falling, and to eliminate the necessity of a separate instrument for such purpose, there is arranged at the end of the telescoping members 17 and 18, a pair of jaws 28 and 29, which are integrally formed on the arms 30 and 31. The arms 30 and 31 are connected together slightly forward of their ends by means of a screw 32, by which they are also secured to the member 17, and the rearwardly extending shoulders 33 normally abut against each other and are secured in engagement with each other by means of a clip 34, which is held in place by the screw 32, so that the contraction and expansion of the jaws depends upon the resiliency of the arms 30 and 31. The arms are bent so as to cross each other, intermediate of their ends, and the jaws thereon are normally urged apart by the resilient structure of the arms. The arms 30 and 31 are bent outwardly around

the pin 35, carried by the rod 18, and crossed forwardly thereof, so that as the pin 35, which travels in the slot 36, formed in the member 18, is drawn rearwardly along and
 5 between the arms 30 and 31, the adjacent parts of the arms are forced apart, causing the jaws at their ends to close. Each of the jaws 28 and 29 has an inwardly extending lip 37, under which the wire filament 27 is
 10 adapted to be slipped so as to shape the loop, and also prevent its distortion when the instrument is being placed in position to perform the operation.

The operation of the device shown is as follows:—The construction of this instrument permits of the use, with a single pair of levers, of a number of different kinds of operating parts, two of which are shown in the drawings. The instrument shown attached to the levers in Fig. 1 is particularly
 20 adapted for use in removing adenoids, and the instrument shown in Fig. 9 shows the one usually used for the removal of the tonsils. It often happens that when it is
 25 necessary to remove such growths as adenoids, it is also necessary to remove the tonsils at the same time, in which case, the surgeon will have both instruments in readiness. If the adenoids are to be removed
 30 first, the instrument for that purpose will be connected to the handles as shown in Fig. 1. This is done by pushing the spring slides 11 rearwardly along the levers, inserting the cylindrical parts 8 into the
 35 sockets 7, and pushing the slides forwardly, so as to bear on the flat surface of the parts 8, and thereby secure the parts in operative connection. The nut 22 is turned back so as to extend the end of the extension 23 be-
 40 yond the end of the tubular member 17 to permit the easy threading of the wire filament 27 through the apertures 26. The nut 22 may then be turned forwardly so as to withdraw the ends of the filament into the
 45 tube 17 to cause it to be adjusted to the desired size. After this adjustment is made, opposite sides of the filament may be now slipped under the lips 37, and the instrument is ready for use. The instrument is then
 50 placed over the growth, and the handles 4 and 5 are pressed together. This gives the members 17 and 18 a relatively longitudinal movement, and as the pin 35 travels backward along the arms 30 and 31, the
 55 jaws 28 and 29 are forced into gripping engagement with the growth, and the wire filament 27 is contracted and drawn through the growth. The resilient structure of the arms 30 and 31 allows the jaws to yield after
 60 engaging the growth, and thereby permit the continued contraction of the filament. The operating parts can then be quickly separated from the levers, and other operating parts substituted for further operation
 65 on the adenoids or the removal of the tonsils.

An important feature of this device is the pivoting of both of the operating members to their respective levers, as it permits the handles to be operated without tending to
 cause displacement of the snare, which frequently happens in instruments where one
 70 of the handles is rigidly connected to one of the parts of the operating stem, in which case, the whole stem tends to swing in an arc about the pivotal connection between
 75 the handles.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the construction shown may be altered or
 80 omitted without departing from the spirit of this invention as defined by the following claims.

We claim:—

1. A surgical instrument, comprising a
 85 pair of levers pivotally connected together, a pair of members slidable lengthwise one along the other and respectively connected to said levers, operating means carried at
 90 the end of said members and actuated through the relative longitudinal movement of said members, a pair of jaws carried by one of said members and disposed adjacent to said operating means and in a plane
 95 transverse to said members, and means carried by the other said member for causing the relative movement of said jaws simultaneously with the actuation of said operating means.

2. A surgical instrument, comprising a
 100 pair of levers pivotally connected together, a pair of members slidable lengthwise one along the other and respectively connected to said levers, a snare carried at the end of said members and actuated through the rela-
 105 tive longitudinal movement of said members, a pair of jaws carried by one of said members and disposed adjacent to said snare and in a plane transverse to said members, means carried by the other said
 110 member for causing the relative movement of said jaws simultaneously with the actuation of said snare, and means for supporting said snare in a plane parallel to the operating plane of said jaws.

3. A surgical instrument, comprising a pair of levers pivotally connected together, a pair of members respectively connected to said levers and adapted to be moved longitudinally of each other, a pair of arms hav-
 120 ing spring shanks rigidly connected at their inner ends to one of said members and being crossed adjacent to their outer ends, coacting jaws on the outer ends of said arms, a projection carried by said other member and adapted to coact with the opposed edges of
 125 said arms inward of the point of said crossing to cause the closing of said jaws through the relative movement of said members.

4. A surgical instrument, comprising a
 130

pair of levers pivotally connected together, a pair of members relatively slidable lengthwise one along the other, a trunnion on each of said members, a bearing on each of said
 5 levers for the respective trunnions, means for detachably holding said trunnions in said bearings, and a snare loop carried by one of said members and adapted to be contracted through the relative movement of
 10 the other said member.

5. A surgical instrument, comprising a pair of levers pivotally connected together intermediate of their ends, a socket in the end of each of said members, a trunnion
 15 mounted to rotate in each of said sockets, a pair of members respectively connected to said trunnions, and means carried by one of said members and adapted to be contracted or expanded through the relative
 20 movement of said other member.

6. A surgical instrument, comprising a pair of levers pivoted together intermediate of their ends, a substantially cylindrical socket formed in the end of each of said
 25 levers, a pair of members relatively slidable lengthwise, one along the other, having trunnion bosses carrying said members and adapted to be rotatably supported in the sockets of the respective levers, and means
 30 carried by one of said members and adapted to be contracted through the relative movement of the other said member.

7. A surgical instrument, comprising a pair of levers pivotally connected together,
 35 a pair of members relatively slidable lengthwise one along the other, a trunnion on each of said members, a bearing on each of said levers for the respective trunnions, a slide on each of said levers adapted to be shifted
 40 into position for holding said trunnions in said bearings, and a snare loop carried by one of said members and adapted to be contracted through the relative movement of the other said member.

45 8. A surgical instrument, comprising a pair of levers pivotally connected together intermediate of their ends, a tube pivotally

connected to one of said levers, a rod pivotally connected to said other lever and telescoping with said tube, said rod being slid-
 50 able relative to its pivotal connection and having a part thereof threaded, and a nut engaging said threads and adapted to cause relative movement of said rod and tube
 55 when said levers are relatively stationary, and a snare adapted to be contracted through the relative movement of said tube and rod.

9. A surgical instrument, comprising an operating stem, a filament looped to form
 60 a snare at one end of said stem, a pair of jaws mounted on said stem and disposed in a plane transverse to said stem and movable toward and away from each other, means
 65 operative from the opposite end of said stem for contracting said snare and closing said jaws, and means on said jaws adapted to engage opposite parts of said snare for supporting and guiding the same, in a plane
 70 substantially parallel with that of said jaws.

10. A surgical instrument, comprising an operating stem, a filament looped to form
 a snare at one end of said stem, a pair of
 75 jaws mounted on said stem and disposed in a plane transverse to said stem and movable toward and away from each other, means operative from the opposite end of said stem for contracting said snare and closing said
 80 jaws, and means on said jaws adapted to engage opposite parts of said snare for supporting and guiding the same in a plane substantially parallel with that of said jaws, said snare engaging means being shaped to permit said snare to be withdrawn and continue its contraction after the closing of said
 85 jaws.

Signed at Chicago this 27th day of September 1910.

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