

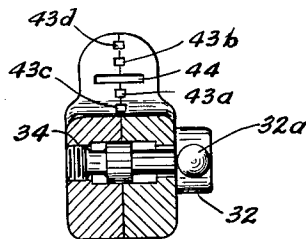
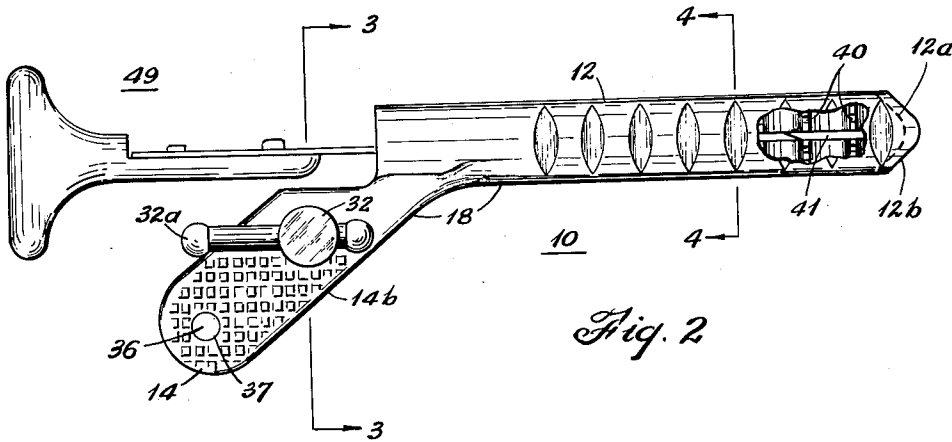
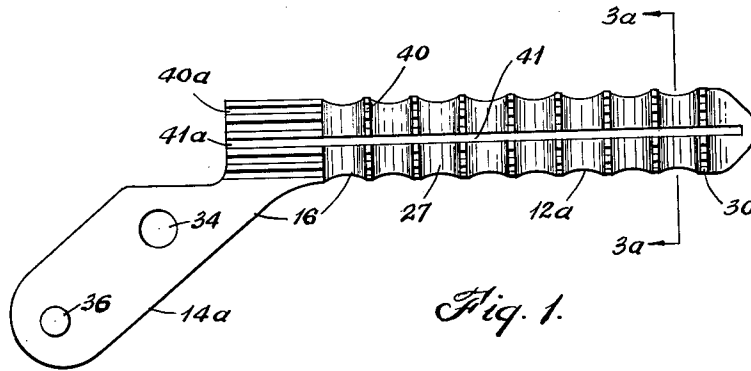
Feb. 6, 1962

J. L. WHITEHILL ET AL
ANASTOMOSIS CLAMP

3,019,789

Filed June 30, 1958

3 Sheets-Sheet 1



INVENTORS
JULES L. WHITEHILL
CHARLES E. GAGNIER.
BY *Max E. Shirk*
ATTORNEY.

Feb. 6, 1962

J. L. WHITEHILL ET AL

3,019,789

ANASTOMOSIS CLAMP

Filed June 30, 1958

3 Sheets-Sheet 2

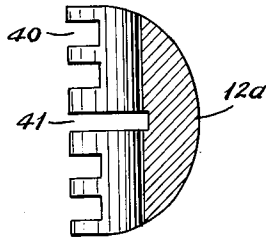


Fig. 3a

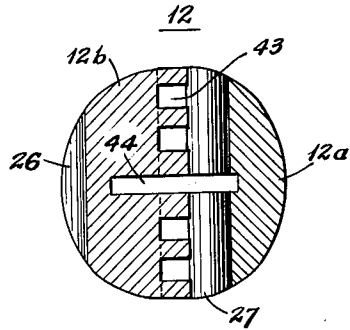


Fig. 4.

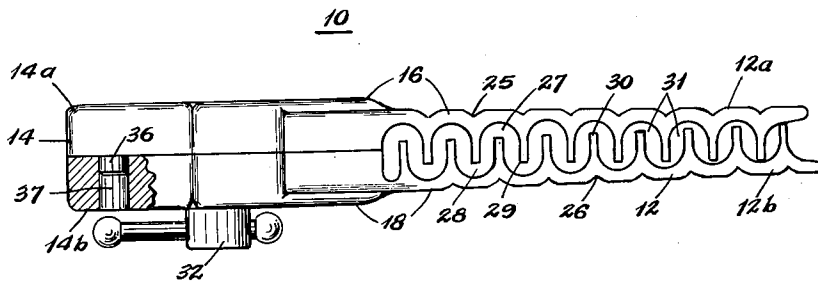


Fig. 5.

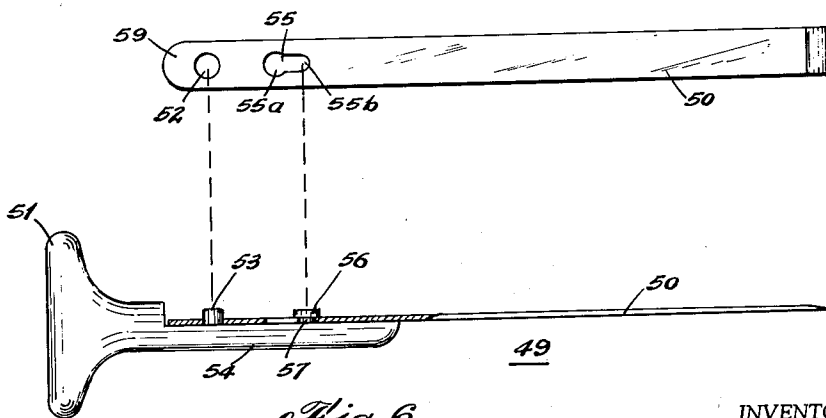


Fig. 6.

INVENTORS
JULES L. WHITEHILL
CHARLES E. GAGNIER.
BY *Max E. Shirk*
ATTORNEY.

Feb. 6, 1962

J. L. WHITEHILL ET AL

3,019,789

ANASTOMOSIS CLAMP

Filed June 30, 1958

3 Sheets-Sheet 3

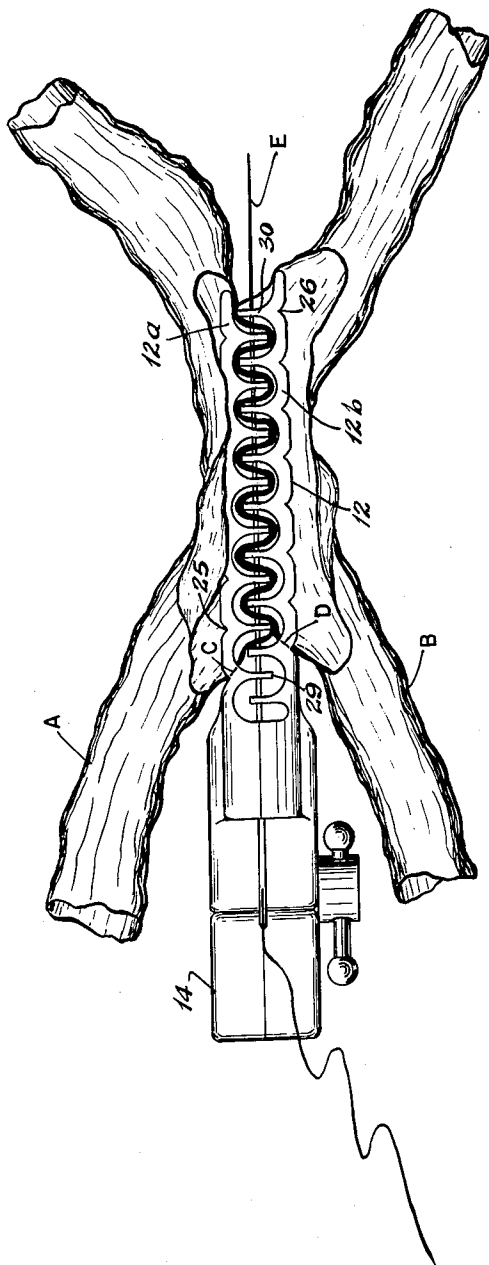


Fig. 7.

INVENTORS
JULES L. WHITEHILL
CHARLES E. GAGNIER.
BY *Max E. Shirk*
ATTORNEY.

1

3,019,789

ANASTOMOSIS CLAMP

Jules L. Whitehill, 209 S. Tucson Blvd., Tucson, Ariz.,
and Charles E. Gagnier, P.O. Box 11312, Tucson, Ariz.
Filed June 30, 1958, Ser. No. 745,636
3 Claims. (Cl. 128—305)

This invention relates to a surgical instrument for placing stitches in parallel rows and making incisions there between in hollow viscera and more particularly to an anastomosis clamp including upper and lower longitudinally extending needle guides and a longitudinally extending knife guide intermediate said needle guides and being capable of holding a wall of each of two hollow viscera in a closely adjacent, undulated shape so that stitches can be sewn therein by passing a needle carrying a suture through said needle guides and so that the viscera can be placed in open communication with each other by passing a cutting instrument through said knife guide.

It is an object of this invention to provide an improved surgical instrument.

Another object is to provide an anastomosis clamp having needle guides and a knife guide.

A further object is to provide a surgical knife for an anastomosis clamp.

Other objects will become apparent upon consideration of the detailed description and the claims which follow.

Because the anastomosis clamp is particularly suited for side to side anastomosis of hollow viscera, the invention will be described as applied to such an operation. It will, however, be understood that the invention is not limited to this particular application, but can be used wherever it is desired to place stitches in parallel rows and make in incision there between.

The invention will be understood more readily by reference to the drawings which form a part hereof and wherein:

FIG. 1 is a side elevation of one half on an anastomosis clamp of the invention;

FIG. 2 is a side elevation, partly in section, of an anastomosis clamp and knife of the invention;

FIG. 3 is a cross-section taken along line 3—3 of FIG. 2 with the knife removed;

FIG. 3a is a cross section, on an enlarged scale, taken along line 3a—3a of FIG. 1;

FIG. 4 is a cross section, on an enlarged scale, taken along line 4—4 of FIG. 2;

FIG. 5 is a plan view of the anastomosis clamp of the invention;

FIG. 6 is a front elevation of the surgical knife of our invention with the blade thereof also shown in plan; and

FIG. 7 is a plan view of the anastomosis clamp in place in hollow viscera with the walls of the viscera partly broken away for clarity.

Referring to FIGS. 2 and 5, an anastomosis clamp, indicated generally by the numeral 10, may include a barrel or blade 12 and an integral grip portion or handle 14, which separate into the blade and grip assemblies 16 and 18, respectively, each having a blade 12a and 12b and a grip portion or handle 14a and 14b.

As shown in FIG. 5, the blade 12a is shorter than the blade 12b and both blades have undulations 20 and 21 which are formed by the arcuate depressions 27 and 28 and protuberances or teeth 29 and 30, respectively. A series of depressions 25 and 26 are spaced along the blades 12a and 12b opposite the highest point of each tooth 29 and 30, respectively, to reduce the thickness of the blades at the teeth so that blades 12a and 12b can be inserted through the smallest possible incision.

2

The teeth 30 on the blade 12b are spaced intermediate the teeth 29 on the blade 12a so that undulations 31 are formed along the blade assembly 12, as shown in FIG. 5.

The blade and grip assemblies 16 and 18 are held together by means of a captive screw 32 (FIG. 3) which passes through the handle 14b and engages a threaded hole 34 in the handle 14a. The screw 32 is tightened by means of a handle 32a which is slidably mounted so that it can be slid out of the way after the screw 32 has been tightened. A pin 36 is rigidly affixed to the handle 14a and engages an opening 37 in handle 14b to prevent movement of one blade and grip assembly with respect to the other.

The teeth 29 and 30 each have a plurality of shallow grooves 40 formed along the face thereof and a deeper slot 41 formed therein intermediate the grooves 40. Similar grooves 40a and a slot 41a are also formed in the blades 12a and 12b adjacent handles 14a and 14b as shown in FIG. 1 for blade and grip assembly 16. When the separate blade and grip assemblies 16 and 18 are clamped together, the grooves 40 and 40a and the slots 41 and 41a form the apertures 43 and 44 shown in FIGS. 3 and 4.

As shown in FIG. 5 the blades 12a and 12b are sprung so that the teeth 29 and 30 near the ends remote from the respective handles 14a and 14b extend deeper into depressions 27 and 28 than they do near the respective handles 14a and 14b. This feature is necessary because the ends of the blades 12a and 12b remote from captive screw 32 have a tendency to spring apart when the portions of the viscera to be anastomosed are clamped there between.

Referring to FIG. 6, a surgical knife 49, made especially for use with the anastomosis clamp 10, includes a blade portion 50 which is just long enough to enter, but not pass through, the last tooth 30 of blade 12a and a handle portion 51. The blade 50 is sharpened at one end as shown and has a first opening 52 adapted to engage a pin 53 on the shank 54 of handle 51 and an elongated opening 55 which has a portion 55a that is large enough to pass over the enlarged head 56 of the stud 57 on the shank 54 and a portion 55b which is too small to pass over the head 56 of the stud 57, but is large enough to encircle the shank portion of the stud 57.

The blade 50 is attached to the handle 51 by passing the portion 55a of elongated opening 55 over the head 56 and stud 57 and then moving the blade 50 longitudinally along the shank 54 so that the shank portion of stud 57 engages the portion 55b of opening 55. The pin 53 will then enter opening 52. To remove the blade 50, its end 59 is sprung up to clear the pin 53 and the blade 50 is moved longitudinally along the shank 54 so that the head of stud 57 clears the portion 55a of opening 55.

In FIG. 7 the blades 12a and 12b are shown in position in hollow viscera, such as two sections of bowel A and B. Incisions C and D, which are about one centimeter in length, are made in the bowels A and B, respectively. The individual blades 12a and 12b may each be inserted into the bowel by twisting the respective blade 12a or 12b in such a manner that the depressions 25 and 26 in the outside walls of the respective blade 12a or 12b will enter the incisions C and D simultaneously with the corresponding teeth 29 and 30, thereby requiring smaller incisions C and D than would be required to insert the full thickness of the individual blades 12a and 12b, including the teeth 29 and 30, in the incision. The blades 12a and 12b are inserted for a distance equivalent to the length of the anastomosis desired and are clamped together, as shown. This clamps the walls of bowels A and B in a closely adjacent, undulated shape so that a suture on a straight needle E can be used to stitch the

3

walls of the bowels A and B together by inserting the needle E into the needle apertures 43 (FIGS. 3 and 4) and pushing it through the individual undulations.

Although other sutures may be used and different sequences of inserting the needle E in the respective needle apertures will manifest themselves, we prefer to use first an atraumatic 3-0 chromic suture on a four inch straight needle and pass it through the needle aperture 43a which lies just below the knife slot 44 (FIG. 3). This suture enters blade 12 at its proximal end, which is adjacent handle 14, and is carried distally through the bowel wall. The suture is then cut off leaving a few inches extending through the wall of the bowel beyond the distal end of blade 12, and about ten inches extending from the proximal end. The suture remaining on the straight needle E is then passed through the needle aperture 43b which lies just above the knife slot 44 leaving a few inches of suture protruding from either end of the blade 12. The two ends of the suture adjacent the distal end of blade 12 are tied while making some traction on the ends adjacent handle 14. The same steps are then repeated using an atraumatic 4-0 silk suture and beginning in the lowermost needle aperture 43c and then the uppermost needle aperture 43d.

The knife 49 is then inserted into the knife slot 44 at the proximal end of blade 12 and run back and forth two or three times to assure a complete division of the bowel. The clamp 10 may then be separated and withdrawn from the bowel.

The openings C and D, which have now been converted to one opening, are closed by means of the posterior chromic stitch which is carried as a through and through suture between both limbs of the bowel posteriorly, is continued anteriorly as an inverting Connell stitch and is then tied to the free end of the chromic suture. The posterior silk suture is continued as a sero-serous stitch and tied to itself. This completes the anastomosis.

The specific example herein shown and described is by way of illustration and not of limitation. Various changes in structure can be effected and comprise a part of the invention in so far as they fall within the spirit and scope of the appended claims.

We claim:

1. A surgical instrument for anastomosing hollow viscera in side-to-side relation comprising first and second blades, each of said blades having horizontally extending teeth forming undulations along its longitudinal

4

axis, grooves in said teeth, each of said blades being adapted to be inserted through a wall of one branch of said viscera, vertically extending slots in said teeth so adapted and arranged that when said blades are clamped together a single horizontal slot will extend along the longitudinal axis of said blades, and means for clamping said blades together in such a manner that the teeth on one blade are interposed intermediate the teeth on the other blade, whereby adjacent walls of said branches of said viscera are held in said undulations in a serpentine shape.

2. A surgical instrument for anastomosing two sections of hollow viscera in side-to-side relation comprising first and second grip portions, a blade portion extending from each grip portion, and a knife portion slidably mounted between said blade portions, each blade portion including horizontally extending teeth forming undulations longitudinally along the inside wall thereof, slots in said teeth for guiding said knife along the longitudinal axis of said blade, first and second sets of grooves in said teeth above and below said slots, respectively, said grooves being adapted to guide a needle along the longitudinal axis of said blade, depressions spaced along the outside wall of each blade opposite each tooth to reduce the thickness of said blades at said teeth thereby minimizing the size of an incision through which said blades may be inserted in a wall of said viscera, and means on said grip portions for clamping said blades together.

3. A surgical instrument for anastomosing hollow viscera in side-to-side relation comprising first and second blades, horizontally extending teeth forming undulations longitudinally along each blade, slots in said teeth, a first set of grooves in said teeth above said slots, a second set of grooves in said teeth below said slots, and means for clamping said blades together in such a manner that the teeth on one blade are interposed intermediate the teeth on the other blade.

References Cited in the file of this patent

UNITED STATES PATENTS

1,448,305	Langbein	Mar. 13, 1923
1,982,207	Furniss	Nov. 27, 1934

FOREIGN PATENTS

708,659	France	May 4, 1931
286,804	Italy	June 23, 1931