

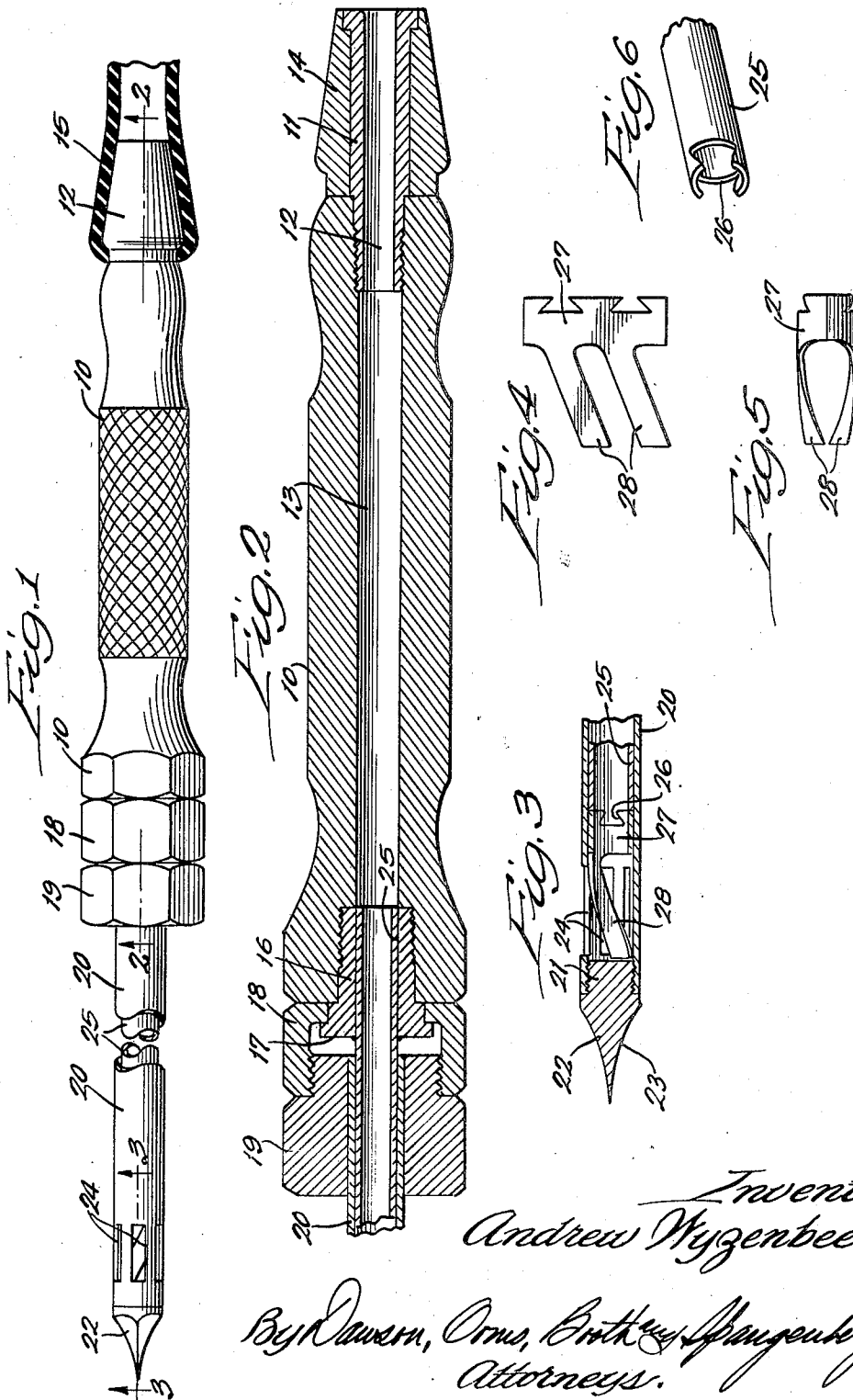
Oct. 10, 1950

A. WYZENBEEK
TROCAR APPARATUS

2,525,329

Filed Sept. 16, 1948

2 Sheets-Sheet 1



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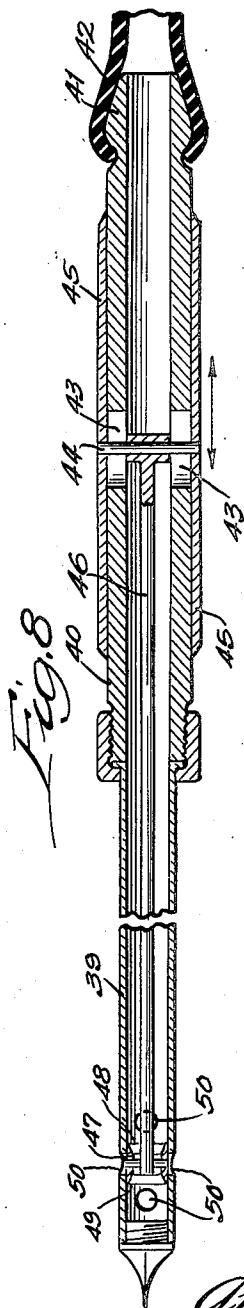
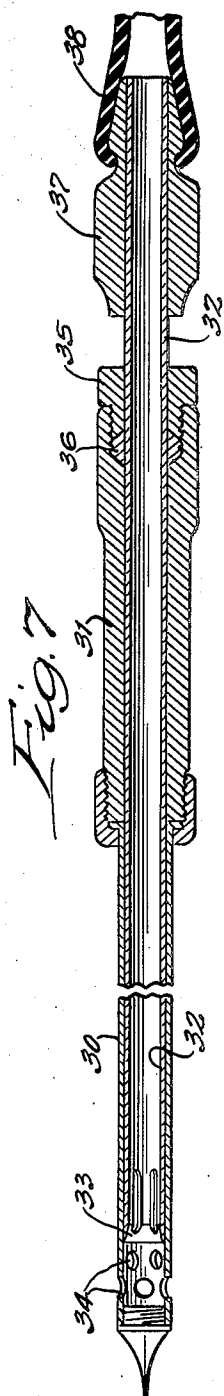
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UNITED STATES PATENT OFFICE

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TROCER APPARATUS

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This invention relates to trocar apparatus.

Under the present practice, the trocar instrument comprises a tube having a pointed end and with inlet apertures near the pointed end. A suction tube leads from the rear end of the instrument to a vacuum pump which may be of various types. The hollow tube described becomes easily clogged with tissues and the withdrawal of internal liquids becomes difficult. The instrument has to be repeatedly withdrawn and cleaned by means of a rod, etc. Thus, the operation is one involving considerable time and often with unsuccessful results in the withdrawal of liquids.

An object of the present invention is to provide trocar apparatus effective in cleaning itself without requiring the withdrawal of the instrument. Yet another object is to provide simple apparatus in which the injected tube may be repeatedly cleaned of tissue to permit the effective withdrawal of liquids without requiring the removal of the injected tube. A still further object is to provide apparatus of unique structure in which a handle is rotatably or reciprocatingly mounted between the injected tube and the suction tube for effectively moving the cutter for maintaining ports or slots open within the injected tube. Yet another object is to provide such an apparatus in which the cutter, while effectively held in position for movement within the outer or slotted tube, may be readily separated for cleaning upon the withdrawal of the outer tube. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated in a single embodiment, by the accompanying drawing, in which—

Fig. 1 is a plan view of a trocar instrument embodying my invention; Fig. 2, a vertical sectional view; Fig. 3, a broken detail sectional view showing the forward portion of the instrument; Fig. 4, a plan view of the flat metal strip employed for forming the cutter; Fig. 5, a plan view of the cutter formed from the flat strip shown in Fig. 4; Fig. 6, a perspective view of the end of the tube adapted to receive the rear portion of the cutter; Fig. 7, a longitudinal sectional view of a modified form of the invention; and Fig. 8, a longitudinal sectional view of another modified form of the invention.

In the illustration given in Figs. 1 to 6 inclusive, 10 designates a handle member equipped at its rear with a threaded tubular member 11. The member 11 may be threaded into a recess at the rear of handle 10 so that the passage 12 within the tube 11 is aligned with the longitudinal passage 13 within the handle 10. Rotat-

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ably mounted upon the member 11 is a swivel member 14 adapted to receive a flexible tube 15 leading to a source of suction. Thus, the handle 10 is free to rotate without turning the tube 15 by reason of the swivel member 14 interposed between tube 15 and the fixed fitting 11.

The handle 10 is also provided with a threaded fitting 16 at its forward end, as shown more clearly in Fig. 2. The fitting 16 is provided with an outer spaced flange 17 providing between it and the handle wall a recess adapted to receive the swivel ring 18. The swivel ring 18 has an inwardly extending portion received within the recess and adapted to rotate upon the member 16. At its forward end, the ring 18 threadedly engages a nut 19. The hollow nut 19 is fixed to an outer tube 20 by sweating or by any other suitable means. Thus, in the structure shown, the outer tube 20, nut 19, and the swivel ring 18 are joined together so that they rotate with respect to the member 16.

The outer tube 20 is internally threaded at its forward end to receive the threaded neck 21 of a point member 22. The point 22 may be of any suitable form so as to provide a penetrating edge or point, but I prefer to have a pointed portion which has concave lines, as indicated at 23.

To the rear of the point 21, the outer tube 20 is provided with a plurality of inlet slots 24, as shown more clearly in Figs. 1 and 3.

An inner tube 25 is fixed to the fitting 16 by sweating the tube therein or by other means, and the inner tube is provided with a tongue and groove end structure 26, as shown best in Fig. 6.

A cutter 27 is provided also with a tongue and groove structure 28 complementary to the structure 26 of tube 25 so that the cutter 27 may be fitted into interlocking engagement with the forward end 26 of tube 25. The cutter 27 is provided with the forwardly extending cutter blades 28 provided with cutting edges and turned so as to traverse the interior of the outer tube 20 along the slots 24. It will be understood that any suitable cutter device for effectively cutting tissue extending through the slots 24 may be employed.

Operation

In the operation of the apparatus, the rear swivel connection 14 is connected with a suction tube 15 which leads to any source of suction. The outer pointed tube 20 may be introduced in the usual manner for the withdrawal of liquids and during the withdrawal of liquids,

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the handle 10 may be rotated periodically to cut away any fragments of tissue extending through the slots 24, thus maintaining the slots 24 open at all times for the withdrawal of fluids.

The apparatus may be readily disassembled, as already indicated, for cleaning. The threaded connections permit a complete disassembly if this should be desired. Ordinarily, the outer tube may be removed by separating nut 19 from the swivel ring 18 and upon the withdrawal of the outer tube 20, the cutter 27 may be removed readily from the inner tube 25. Thus effective cleaning of the cutter portion of the instrument may be readily effected and, if desired, the cutter may be replaced by a new cutter structure. If desired, the cutter may be formed as a fixed part of the inner tube. I prefer, however, to employ a separable cutter for the purpose of ready cleaning or replacement of the same.

In the illustration given in Fig. 7, the outer tube 30 is fixed to a stationary handle member 31 and an inner tube 32 is mounted for reciprocation within the handle 31 and tube 30. The inner tube 32 is provided with a cutter 33 at its forward end so that when the cutter is reciprocated back and forth in line with the inlet openings 34, any obstructing tissue is cut away. The handle 31 is preferably provided with a stuffing box nut 35 for maintaining packing 36 around the tube 32. Fixed to the outer end of tube 32 is a fitting 37 to which is secured the flexible tube 38 leading to a source of suction. The fitting 37 provides a handle which facilitates the reciprocating of inner tube 32 in the cutting operation.

In the illustration given in Fig. 8, the outer tube 39 is fixed to a central member 40 having at its rear end an enlargement 41 adapted to be received within the flexible tube 42 leading to a source of suction. The member 40 is provided centrally with a transfer slot 43 through which extends a pin 44. The pin is fixed at its ends to a slidable handle 45. Pin 44 extends through a boss carried by the cutter rod 46 and the rod at its forward end is fixed to a cutter member 47. By employing a rod, as described, a cutter 47 having oppositely disposed cutting surfaces 48 and 49 may be used.

By reciprocating the handle 45 in the structure shown in Fig. 8, the cutter edges 49 and 48 are caused to pass the inlet passages 50 and to cut away any obstructing tissue.

The structure shown in Figs. 7 and 8 illustrate two of many different types of apparatus which may be used to embody my invention.

While in the foregoing specification, I have set forth certain structures in considerable detail for the purpose of illustrating an embodiment of the invention, it will be understood that such details of structure may be widely varied by those skilled in the art without departing from the spirit of my invention.

I claim:

1. Trocar apparatus comprising a hollow handle equipped at its front and rear ends with swivel connections, a tube engaging the swivel connection at the rear of said handle and adapted to lead to a source of suction, an outer tube connected to the swivel connection at the for-

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ward end of the handle and having a pointed end, said outer tube having slots adjacent said pointed end, an inner tube fixed to said handle and communicating with the passage there-through, and a hollow cutter member carried by the forward end of said inner tube for rotation within said outer tube adjacent the slots thereof.

2. Trocar apparatus comprising a handle having a longitudinal passage there-through and equipped at either end with swivel connections, a flexible tube connected to the swivel connection at one end and adapted to lead to a source of suction, an outer tube connected to the swivel connection at the other end of said handle and having a pointed end, said outer tube having also drain openings adjacent said pointed end, an inner tube fixed to said handle and communicating with the passage thereof, a rotary cutter mounted within said outer tube for rotation adjacent said openings, and interlocking connections detachably connecting said cutter to said inner tube.

3. In fluid-removing apparatus, an outer tube, a point threadedly connected to the end of said tube and having a concave pointed portion, said outer tube being provided with slots adjacent said point, a cutter mounted within said tube and having blades adapted to traverse the inner surface of said tube for cutting away tissue projecting thereunto, an inner tube connected to said cutter and rotatably mounted within said outer tube, a handle secured to said inner tube and provided with a longitudinal passage communicating with said inner tube, a swivel member carried by said handle, and a suction tube connected to said swivel and adapted to lead to a source of suction.

4. Trocar apparatus comprising an outer tube having a pointed end and drain openings adjacent said end, a cutter slidably mounted in said tube and having cutting edges at opposite ends thereof, a rod secured to said cutter and mounted for reciprocation within said tube, and a conduit communicating with said outer tube.

5. Trocar apparatus comprising an outer tube having a pointed end and having drain openings adjacent said end, a handle member fixed to said outer tube and having a longitudinal passage therethrough, said handle member having a slot extending therethrough, a cutter mounted for reciprocation in said tube, a rod fixed to said cutter and extending rearwardly thereof in said tube and handle, a pin extending through a rear portion of said rod and through the slot in said handle, and a handle sleeve enclosing said handle and fixed to the ends of said pin.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
387,480	Alleman	Aug. 7, 1888
737,293	Summerfeldt	Aug. 25, 1903
1,952,617	Wappler	Mar. 27, 1934
2,072,346	Smith	Mar. 2, 1937