

Oct. 29, 1935.

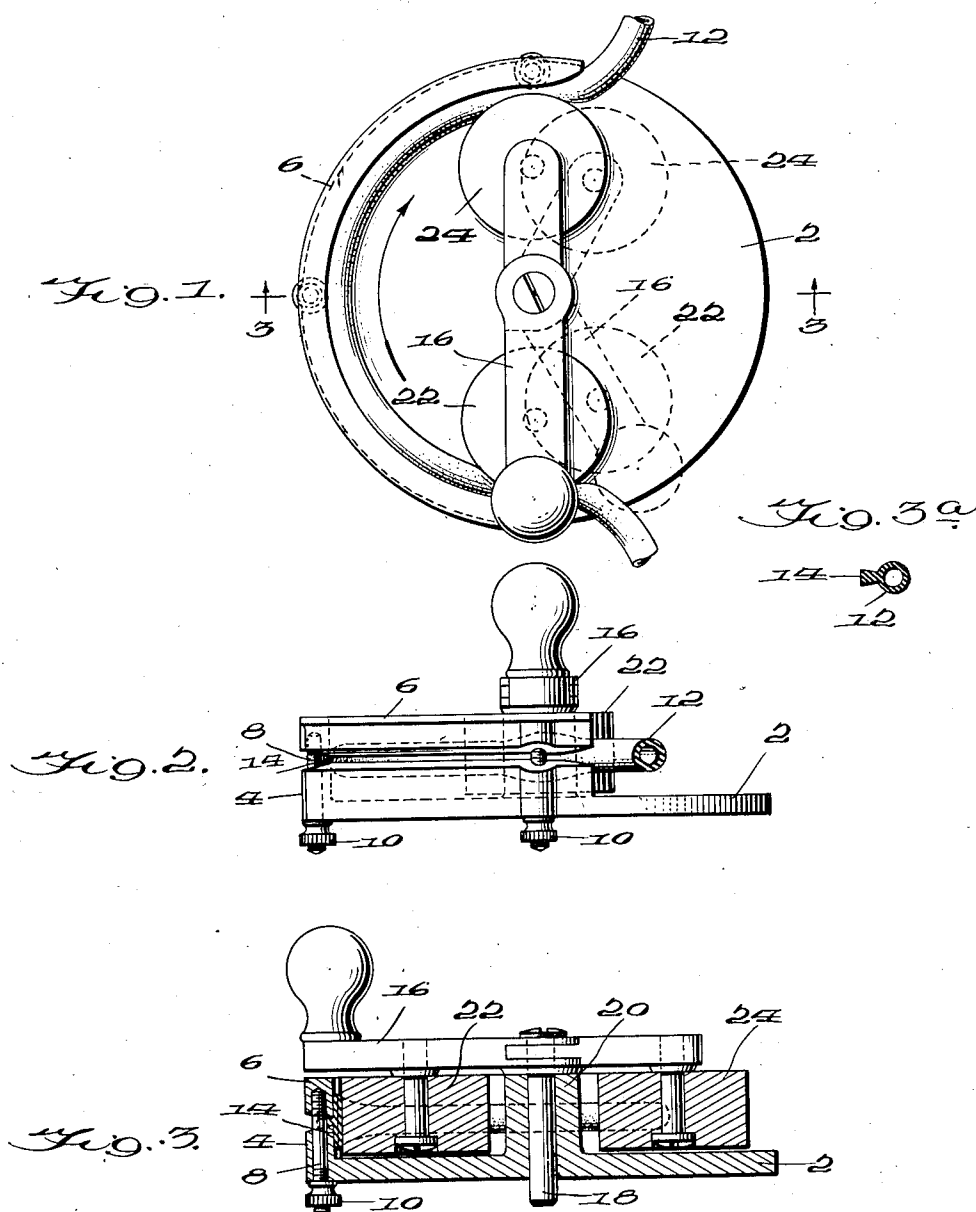
M. E. DE BAKEY ET AL

2,018,999

SURGICAL PUMP

Filed Oct. 11, 1934

2 Sheets-Sheet 1



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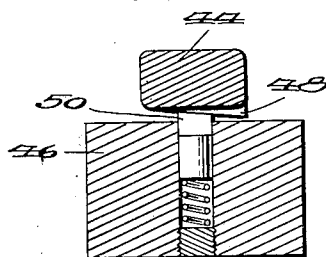
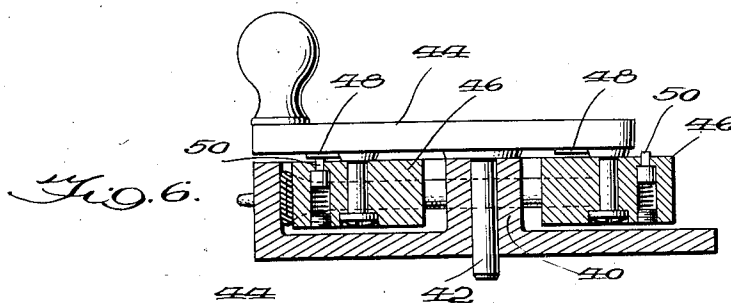
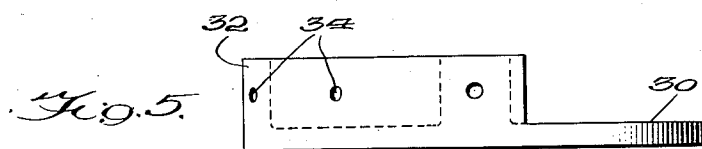
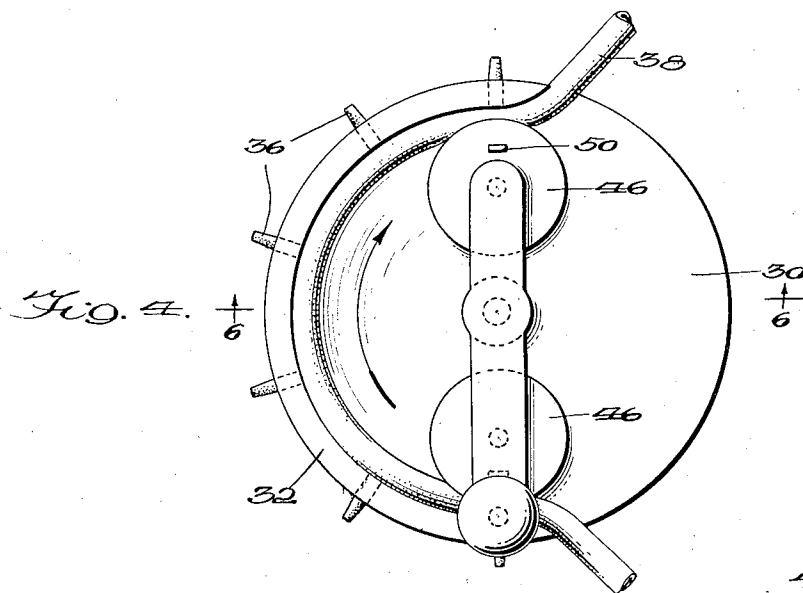


Fig. 7. *Inventor*
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UNITED STATES PATENT OFFICE

2,018,999

SURGICAL PUMP

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Application October 11, 1934, Serial No. 747,947

8 Claims. (Cl. 103—149)

Our invention relates to an improvement in surgical pumps.

An object of our present invention is to provide a simplified surgical pump similar in its mode of operation to a pump disclosed in our co-pending application, Serial No. 725,162, filed May 11, 1934.

An object of the surgical pump disclosed in this application is to provide a rotary pump which is simplified in its construction and is yet efficient and positive in its operation.

A further object of the present application is to provide a surgical pump which may be operated in order to force fluid in one direction, its operation in the opposite direction being either stopped by a locking device or being perceptibly indicated to the operator.

A further object of the present invention is to provide a device which is simple, which is easily assembled, and is securely maintained in its operable assembly.

In the accompanying drawings:

Fig. 1 is a plan view;

Fig. 2 is a side elevation;

Fig. 3 is a cross-section on the line 3—3 of Fig. 1, with the handle turned through 90°;

Fig. 3a is a cross-section of the tube disclosed in Figs. 1 to 3.

Fig. 4 is a plan view of a modified form;

Fig. 5 is a side elevation of the base portion of the modified form, shown in Fig. 4;

Fig. 6 is a cross-section on the line 6—6 of Fig. 4 with the handle turned through 90°;

Fig. 7 is a detail of the locking device of the modified form disclosed in Fig. 4; and

Fig. 7a is a cross-section of the tube disclosed in Figs. 4 to 6.

The pump is composed of a circular base section 2 having an upstanding flange 4 throughout approximately 180° of its periphery. An approximately semi-circular member 6 is adapted to be placed over the flanged portion 4 of the circular base 2, and bolted into position by means of the studs 8 and thumb-screws 10.

In assembling the pump for operation, a rubber tube 12 having a flange 14 on one side thereof is placed against the inside portion of the flange 4, and is secured thereto by placing the semi-circular member 6 over the flange 14 of the rubber tube 12 and bolting the semi-circular member 6 to the flange 4. A hinged crank-arm 16 is pivotally secured to the circular base 2 by means of the crank-pin 18 being placed through a bearing 20 upstanding from the center of the circular base 2. A crank-arm 16 is provided with two

rollers 22 and 24 spaced apart from the crank-pin 18 and in position to compress the rubber tube 12 between either the roller 22 or the roller 24 and the upstanding flange 4 and the semi-circular member 6 as the crank-arm 16 is rotated in a clockwise direction.

If the crank-arm 16 should be rotated in a counter-clockwise direction, the crank-arm 16 and the rollers 22 and 24 will assume the position disclosed in dotted lines in Fig. 1 and the tube will no longer be compressed, hence no fluid will be forced therethrough. Also, if the crank-arm 16 is rotated in a counter-clockwise direction, the flexing of the crank-arm 16 will immediately be perceptible to the operator and the counter-clockwise direction of rotation will be immediately discontinued.

In the modified form disclosed in Figs. 4 to 7, we provide a single circular base section 30 which is provided with an upstanding flange 32 throughout approximately 180° of its periphery. This upstanding flange 32 is provided with a plurality of holes 34 through which the prongs 36 of the rubber tube 38 are adapted to protrude. The prongs 36 are larger in diameter than the holes 34, so that when the prongs 36 are forced through the holes 34 they will be securely held in position, holding the tube 38 securely against the inner edge of the upstanding flange 32.

In the center of the circular base 30 I provide 30 a bearing surface 40 to hold the crank-pin 42 of the crank-arm 44 in proper position.

The crank-arm 44 is provided with two rollers 46 spaced apart from the crank-pin in position to compress the rubber tube 38 against the upstanding flange 32 when the crank-arm 44 is rotated. The under side of the crank-arm 44 is provided with lugs 48 which are adapted to allow the spring-pressed pins 50 mounted in the rollers 46 to pass in one direction only, so that if the crank-arm 44 is rotated in a clockwise direction, the pins 50 will pass the lugs 48 on the under side of the crank-arm 44 as the rollers 46 roll against the tube 38.

If the crank-arm 44 should be rotated in a counter-clockwise direction, the rollers 46 would consequently rotate in an opposite direction, and the pin 50 would abut against the lug 48 on crank-arm 44, and further counter-clockwise rotation of the crank-arm 44 would be stopped.

In this form of pump, it will be seen that the assembly is simple and yet the efficiency of the operation of the pump is in no manner hindered.

In both of the forms, it will be noted that the crank-pins 18 and 42 have been provided with a 55

pin protruding beyond the circular base members 2 and 30. The object of this protruding crank-pin is to provide a space whereon a convenient rotation counter may be attached at the time the pump is assembled for operation.

Such a rotation counting device would serve not only for counting the number of revolutions made by the crank-arm 16 or 44, but also would serve to hold the crank-arm assembled in its proper position, thus keeping the rollers 24 or 46 in their proper position to compress the tube 12 or 38.

In the form of our pump disclosed in Figs. 1 to 3, it will be understood that if the crank should inadvertently or accidentally be rotated in a counter-clockwise direction, the crank arm 16 will flex and assume the position shown in dotted lines in Fig. 1. This flexing of the crank-arm will immediately become perceptible to the operator and the counter-clockwise rotation will be immediately stopped.

It will be understood that minor changes may be made from time to time without departing from the spirit of the invention and the scope of the appended claims.

We claim:

1. In a surgical pump, an approximately circular base having a flange around approximately 180° of its periphery, a tube and rollers for compressing said tube against said flange only when said rollers are rotated in one direction.

2. In a surgical pump, an approximately circular base having a flange around approximately 180° of its periphery, a tube, prongs on said tube, said prongs adapted to pass through said flange to hold the tube in adjusted position, and rollers for compressing said tube.

3. In a surgical pump, an approximately circular base having a flange around approximately 180° of its periphery, a tube secured to said flange, and rollers adapted to compress said tube against said flange only when rotated in one direction.

4. In a surgical pump, an approximately circular base, an upstanding flange around approx-

imately 180° of the periphery of said base, a tube having a protuberance extending from one side thereof, means for engaging said protuberance to hold the tube in adjusted position, and rollers adapted to compress said tube against said upstanding flange only when said rollers are rotated in one direction.

5. In a surgical pump, an approximately circular base, an upstanding flange around approximately 180° of the periphery of said base, a tube secured to said flange, rollers adapted to compress said tube against said upstanding flange when said rollers are rotated in one direction, and means for disengaging said rollers from contact with said tube when the rollers are rotated in the opposite direction.

6. In a surgical pump, an approximately circular base having a flange around approximately 180° of its periphery, a tube secured to said flange, a hinged crank-arm pivotally secured to said base, rollers attached to said crank-arm remote from the pivot point thereof, said rollers adapted to compress said tube against said flange when rotated in one direction only.

7. In a surgical pump, a base having a flange around approximately 180° of its periphery, a tube secured to said flange, a hinged crank-arm pivotally secured to said base and rollers attached to said crank-arm at approximately its extremities, said rollers adapted to compress said tube against said flange when rotated in one direction.

8. A device of the character described including a base and compression means rotatable with respect to the base, a curved wall approximately concentric with the center of rotation of said compression means and having openings therein, a tube compressed between the rotatable compression means and the said curved wall, and prongs on said tube adapted to extend through said openings in said wall to prevent the tube from creeping endwise.

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