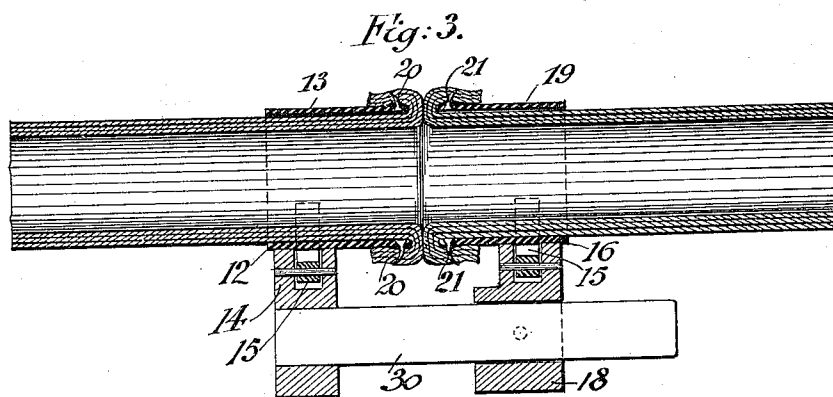
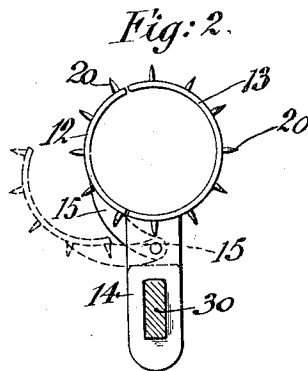
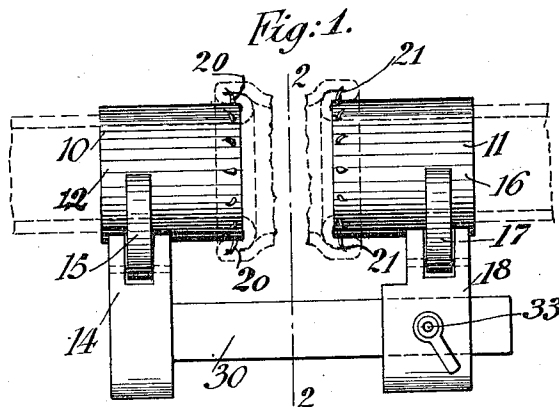


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 INSTRUMENT FOR THE TRANSFUSION OF BLOOD.
 APPLICATION FILED DEC. 22, 1911. RENEWED JAN. 22, 1915.

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Patented Aug. 24, 1915.



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INSTRUMENT FOR THE TRANSFUSION OF BLOOD.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ANGELO L. SORESI, a subject of the King of Italy, residing in New York, in the State of New York, have invented certain new and useful Improvements in Instruments for the Transfusion of Blood, of which the following is a specification.

The direct transfusion of blood from the artery of one person to the vein of another, or from one vein to another, is considered one of the most valuable therapeutic means of preventing death from hemorrhage, and is very important in many critical cases.

The object of the present invention is to provide means whereby this transfusion may be conveniently and safely accomplished, with the least loss of blood and with the least injury to the arteries, veins and surrounding tissues.

For this purpose one embodiment of the invention comprises two split rings or cylinders, one for each blood-vessel, which by opening may be applied to the blood-vessel and then closed to surround the same, said rings being provided with outwardly-projecting hooks adapted to retain the ends of the parts when the same are cut, and means adjustably connecting the rings so that the same are retained in juxtaposition during the flow of blood. The parts are so arranged and the use of the same is such that no clogging of the blood is occasioned, or any injury to the arteries.

In the accompanying drawing, Figure 1 is a side-elevation, on an enlarged scale, of an instrument embodying my invention, Fig. 2 is a section on line 2—2 of Fig. 1, and Fig. 3 is a longitudinal section through the instrument, showing the same applied for use.

Similar letters of reference indicate corresponding parts.

In the drawing, the tube 10 for the artery and 11 for the vein, (or vice versa, as desired for use), are made of thin metal, such as silver, and of a size suitable to receive within them the blood-vessels to be employed in the transfusion, both of said tubes being preferably of the same size, as shown.

One part or half of the ring, tube or cylinder 10 is fixed to or made integral with a post 14, and the other part of the ring is pivoted to said post 14 by a lug 15, so as to swing freely toward and away from the stationary part 13 of the ring. The hinged portion 16 of the opposite ring 11 is by lug 17 correspondingly pivoted to a slide 18.

The two rings are provided at their inner adjacent portions, near their edges, and over their periphery, with radial, outwardly-extending, rearwardly-curved hooks 20, 21, of such length and so located and constructed as to receive and securely retain the artery or vein hooked thereon as hereinafter described and as shown in the drawings, whereby the hooks engage the exterior of the blood-vessels when the same are turned or cuffed over around the ring by reason of which the inner face of the vessel is not affected by the hooks.

A shank 30 is secured at one end in the post 14 and extends longitudinally of the instrument and parallel with the blood-vessel rings; and upon said shank is slidably supported the slide 18. A set-screw 33, having a handle for convenient and powerful operation, is seated in the slide 18 and adapted to bear against the shank and thereby securely retain the same at any point in the length of the shank. The shank is of rectangular cross-section as shown in Fig. 2, or of other shape so as to retain the rings 10 and 11 always in juxtaposition, that is to say, in opposition on the same axial line.

In use, the operation is conveniently divided in three stages:

First stage—Isolating the blood-vessels.—After having in the usual manner isolated the blood vessels, a spatula, flat retractor, rubber tissue, etc., will be passed under them, for preventing the hooks catching in the tissues around the wound.

Second stage—Placing the cylinders, and inverting the blood vessels over the hooks.—One of the rings, 10 for instance, is opened by swinging its hinged part 12 away from its fixed part 13, and the ring is placed upon the blood-vessel and closed. The ring 11, with its slide, has previously been removed from the shank 18, so as to be out of the way and to be ready for being applied to the other blood-vessel, which is then accomplished in the same manner, the hinged part 16 being opened away from the fixed part 19, and closed again upon the same with the blood-vessel therein. Each blood-vessel is now, without cutting, drawn back or invaginated upon the hooks, as indicated in dotted lines in Fig. 1. This may be conveniently done with pointed forceps.

Third stage.—When both vein and artery, or those parts acting as donor and acceptor, are invaginated over the cylinders, they will be cut with a sharp knife close to the edge

of the cylinders, and the latter brought quickly together, by placing the slide upon the shank and moving the same toward the post 14 until the exposed inner faces of the artery and vein abut, as indicated in Fig. 3. The set-screw 33 is then operated, whereby the parts are clamped in position. The blood will then run freely from the artery to the vein. The two remaining segments of artery and vein are of course separately tied. When the operation is complete, the continuity of the artery may be reestablished by use of the instrument, the two segments being secured in the cylinders and brought together. Similarly the continuity of the vein may be restored.

It will be noticed that the hinged parts of the rings are retained in closed position by the blood-vessel, each respectively, which it is carrying. It will also be noticed that by the device the operation is capable of being performed very quickly, and no tying of the blood-vessel to be used is necessary, only the unused segments being tied. A mere pinching of the blood-vessel at the instant of transfer is sufficient to stop the flow for the short length of time required. Thereby the vein or artery is handled always in completely open or full position, being retained in this position by the rings, instead of being allowed to empty itself of blood and collapse as in the common methods of performing the operation. In these old methods the blood-vessel became a cord, which it was necessary to first open at the end, and manipulate, before reestablishing the flow. The abutting of the blood-vessels by use of the new instrument takes place while the blood is therein, and thereby a tube instead of a cord is worked with. By use of the device, the inner faces of the blood-vessels are not harmed, and these faces of both vessels are the faces brought in contact, which insures a tight connection. As the blood-vessels are not opened until the moment they are to be put in contact, danger of hemorrhage is practically eliminated. It is impossible to introduce air in the circulation. There is no probability of blood clotting, because it passes directly from the vein to the artery, and the flow continues during the meeting of the members by means of the device. The anastomosis is rapid and easy and it is easy to make a temporary anastomosis between blood-vessels.

It is obvious that changes may be made in the construction of the instrument, without departing from the spirit of the invention.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent:

1. A blood-vessel supporting-device comprising contraction-resisting vessel-engaging means, and laterally-accessible means for supporting said engaging means.

2. A device for the transfusion of blood, comprising blood-vessel rings adapted to be opened for receiving the blood-vessel, means on said rings for securing the blood-vessels thereto before cutting, said rings being separable from each other, and means for securing and retaining said rings in juxtaposition.

3. A device for the transfusion of blood, comprising two rings, each having a fixed part and a part hinged relatively thereto, laterally-projecting hooks at the periphery of said rings, near one edge thereon, a post for one of said rings, a slide for the opposite ring, a shank connecting said post and slide, and a set-screw in said slide for clamping the same to the shank.

4. In a device for the transfusion of blood, a blood-vessel ring surrounding the blood-vessel, and means on the ring for engaging the exterior of the blood-vessel when it is turned over against the ring.

5. A blood-vessel supporting-device comprising laterally-accessible supporting means, and means for holding the blood-vessel in cuffed position when placed thereon.

6. A blood-vessel supporting-device provided at its exterior with means for retaining a blood-vessel in cuffed position thereon.

7. A blood-vessel supporting device comprising a supporting member adapted to be placed in supporting position at the exterior of an uncut blood-vessel, and holding means carried by said member and adapted to engage the uncut vessel at the exterior of the same and to support the same in open condition.

8. A device for the transfusion of blood, comprising blood-vessel supporting members adapted to be placed in supporting position at the exterior of an uncut blood-vessel, holding means carried by said members and adapted to engage the uncut vessel at the exterior of the same, and means for positioning said members relatively to each other.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

ANGELO L. SORESI.

Witnesses:

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M. E. MENSCH.