

June 21, 1932.

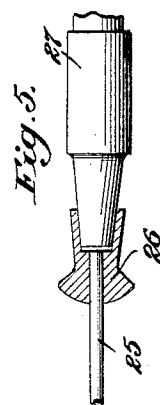
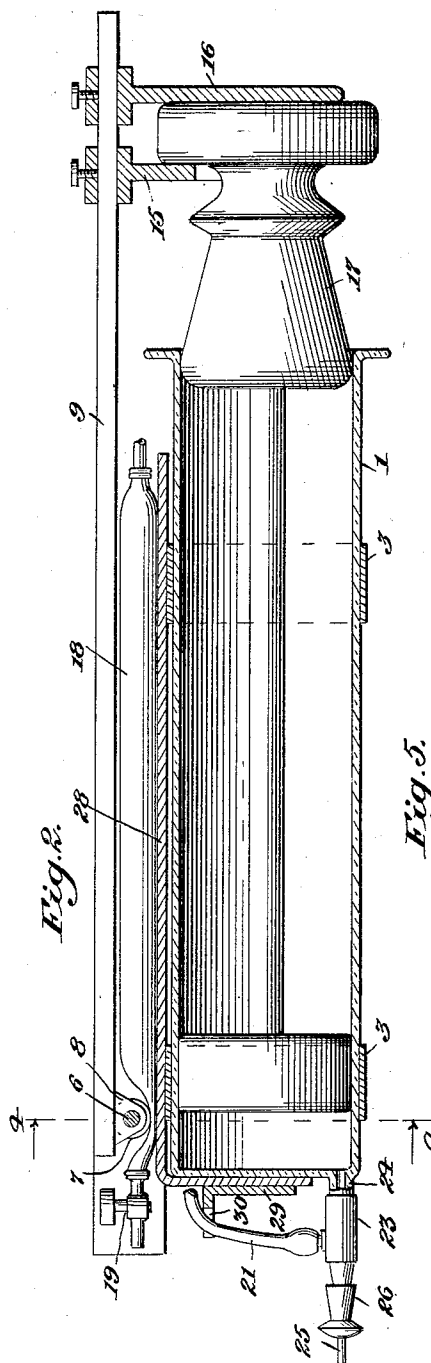
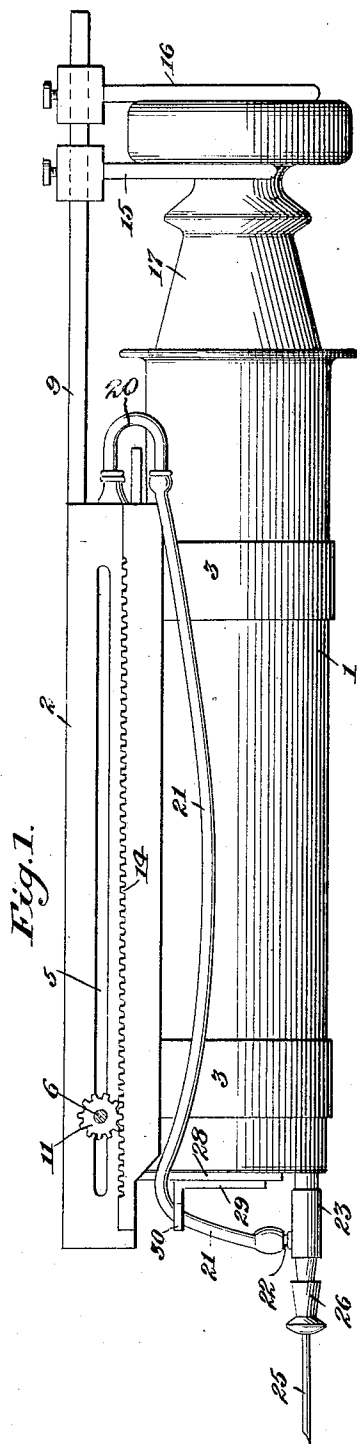
J. D. PARIETTI

1,863,994

APPARATUS FOR THE TRANSFUSION OF BLOOD

Filed March 27, 1930

2 Sheets-Sheet 1



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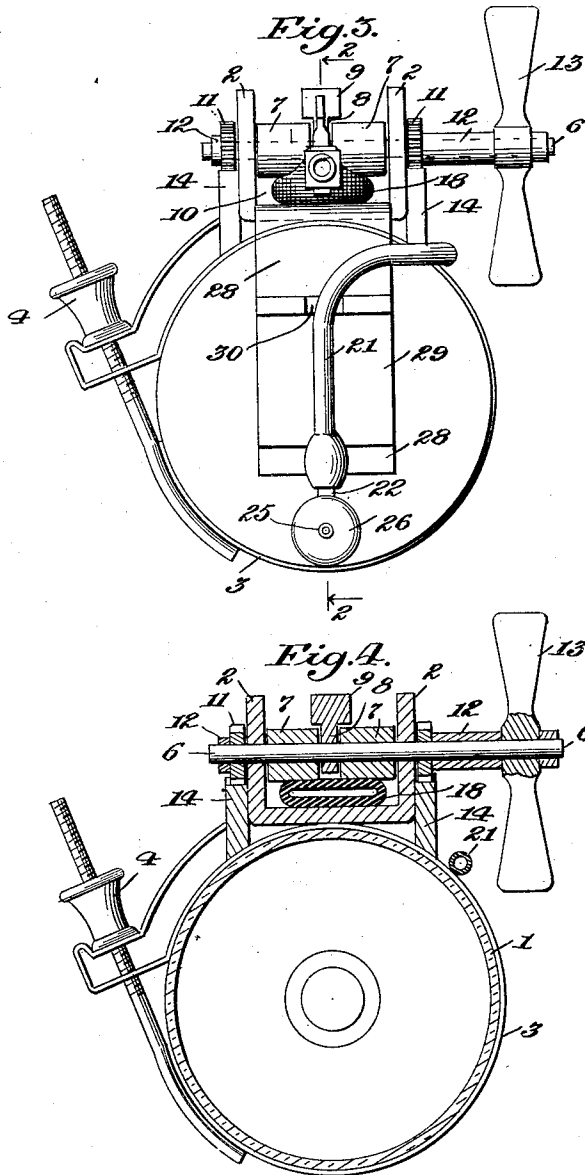
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APPARATUS FOR THE TRANSFUSION OF BLOOD

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UNITED STATES PATENT OFFICE

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APPARATUS FOR THE TRANSFUSION OF BLOOD

Application filed March 27, 1930. Serial No. 439,424.

This invention refers to an improved process and apparatus for transfusion of blood, with novel features which render same more advantageous than the process known heretofore in which a common syringe is used. With my process and apparatus the danger of coagulation of the blood is avoided, as it makes it possible to citrate the blood in due proportion and in a perfect, regular and automatic manner immediately after the blood has passed through the absorbing needle and before reaching the barrel of the syringe.

My invention also facilitates the technic of transfusion of blood, because the movements of the piston of the syringe are controlled by a special device which produces a smooth, efficient and continuous flow and eliminates the violent efforts or movements which occur when a common syringe is used.

In my improved process for the transfusion of blood a metal apparatus or device coupled to a syringe of glass or of any other suitable material, preferably of the Luer type, with a lateral nozzle, is used. However, any other type of syringe stronger and less fragile than the one mentioned may be used.

In order that my invention may be understood and carried into practice, I have illustrated it in the accompanying drawings, in which

Figure 1 is an elevation view of the syringe and the device.

Figure 2 is an elevation view of the rod which controls the absorbing and discharging actions of the apparatus.

Figure 3 shows the system of the tubes and their accessories used in citrating the blood absorbed.

Figure 4 is a cross sectional view of the apparatus.

Figure 5 shows the nozzle used when the blood is injected into the patient.

My apparatus consists of a syringe 1 carrying on its longitudinal upper portion a U shaped runner 2 opened at its ends, said runner being secured to the barrel of the syringe by means of clips 3 adjustable to the barrel of the syringe by means of adjust-

ing screws 4. Runner 2 has slotted side walls 5 through which passes a shaft 6. Mounted on the part of shaft 6 which is inside runner 2 there are two rollers 7, and in between the said two rollers there is a piece 8 to which is solidly connected one end of a rod 9 which is longer than runner 2. Between rollers 7 and piece 8 and the inner lower surface of runner 2 there is a space 10 the purpose of which is hereinafter explained. Mounted on shaft 6 outside the side walls of runner 2 are the spur wheels 11 with their lock nuts 12, said shaft 6 carrying on one of its ends a handle 13. The spur wheels 11 engage toothed racks 14 securely fastened to the outside of runner 2 as shown in Figures 1 and 2. Rod 9 carries on its free end two sliding adjustable pieces 15 and 16, piece 15 being fork shaped, adaptable to engage the neck of piston 17, and piece 16 adaptable to engage the head of piston 17 of syringe 1 as shown in Figure 1. 18 is a rubber tube carrying in one of its ends a cock 19 and in the other end a U shaped metal connection 20 which is connected to another rubber tube 21 which in turn is connected to knob 22 of nozzle 23 which carries the carrier 26 of needle 25, and is mounted on nozzle 24 of syringe 1. 27, Figure 5, is a nozzle used in place of nozzle 23 when the apparatus is used for injecting the blood. 28 is the turned down front prolongation of the piece which forms the floor of runner 2, said prolongation 28 being used as a support of the apparatus when the blood is injected. The said prolongation 28 carries securely mounted thereon an L shaped piece 29, its free end having a notch 30 which serves as a support for tube 21.

My apparatus is worked as follows: Rubber tube 18 is placed in space 10 and is connected to rubber tube 21 outside the apparatus by means of connection 20, the free end of tube 21 being then connected to knob 22 of nozzle 23. These tubes in position and the apparatus also in working position as shown in Figure 1, tube 18 is charged through cock 19 with the citrated solution. The needle is then inserted into the person from whom the blood is to be extracted and the operator

turns handle 13 towards the back of the apparatus, i. e. in a clockwise direction, which will cause spur wheels 11 to engage toothed racks 14. This will move rod 9 backwards and cause fork shaped piece 15 to withdraw piston 17 from syringe 1 thus producing, inside syringe 1, a vacuum which will cause the suction of the blood. Simultaneously with this movement of the piston the rollers 7 will bear pressure on tube 18 charged with the citrated solution and will force this solution, as shown by the arrows, through connection 20, tube 21 and knob 22 of nozzle 23, to mix with the blood as soon as the blood leaves the needle on its way to the barrel of the syringe. Once the blood has been extracted and mixed with the citrated solution as above explained, the rubber tubes 18 and 21 and connection 20 are taken off, the nozzles and needle are changed and a puncture is made on the patient. This done the operator turn the handle 13 towards the front of the apparatus, i. e. in a contrary clockwise direction. This will cause spur wheels 11 to engage racks 14 which will carry rod 9 forward and cause piece 16 to force piston 17 inside the barrel of the syringe and the citrated blood inside the syringe will necessarily be discharged into the body of the patient through nozzle 27 and the needle.

The foregoing clearly explains how my process and apparatus simplifies the operation corresponding to the transfusion of blood, both in the step of withdrawing the blood and of mixing same perfectly in a regular and automatic manner with a citrated solution immediately after the blood passes through the needle, thus eliminating all danger of coagulation, and in injecting the same into the patient in a smooth, efficient and continuous flow.

In my apparatus it can be ascertained that when 250 c. c. of blood have been extracted 5 c. c. of 25% citrated solution have been regularly and gradually mixed with the blood. As in the said 5 c. c. of 25% citrated solution there are 1.25 grams of citrate of soda, with my process the 250 c. c. of blood will have been citrated at 6 per mil. According to Dr. E. Hedón, professor of physiology at Montpellier, the minimum citration to make the blood non-coagulating is 3 per mil. Dr. E. Jeanbrau in his process of transfusion citrated the blood at 4 per mil.

It is understood that certain modifications may be introduced in the apparatus without departing from the scope of the invention.

I claim:

An apparatus for absorbing, citrating, and transfusing blood, comprising a syringe having a piston, a runner mounted above the said syringe, and having slotted side walls, a rack portion in the said slot, a shaft passing through said slots and carrying spur wheels engaging said rack, and a handle for rotating

the said spur wheels; rollers also mounted on the said shaft, means mounted on said shaft having sliding and adjustable elements extending therefrom and engaging the said piston of the syringe, the said rollers and the inner lower surface of the runner defining a space therebetween, flexible tubing mounted in the said space and adapted to be squeezed by the rollers upon rotation and movement of the said shaft along the rack, and a nozzle for the said syringe connected to the said flexible tubing.

In testimony whereof I have signed my name to this specification.

JOSE DAVID PARIETTI.