Dec. 14, 1926. 1,610,622

M. SHAWEKER

BLOOD TRANSFUSION MEANS

Filed August 11, 1926

Fig. 1.

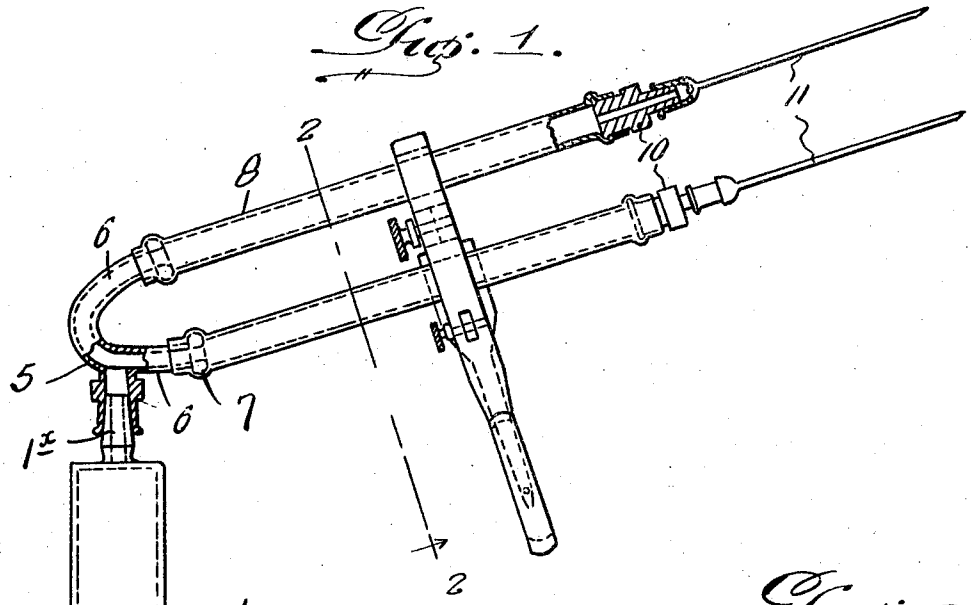


Fig. 2.

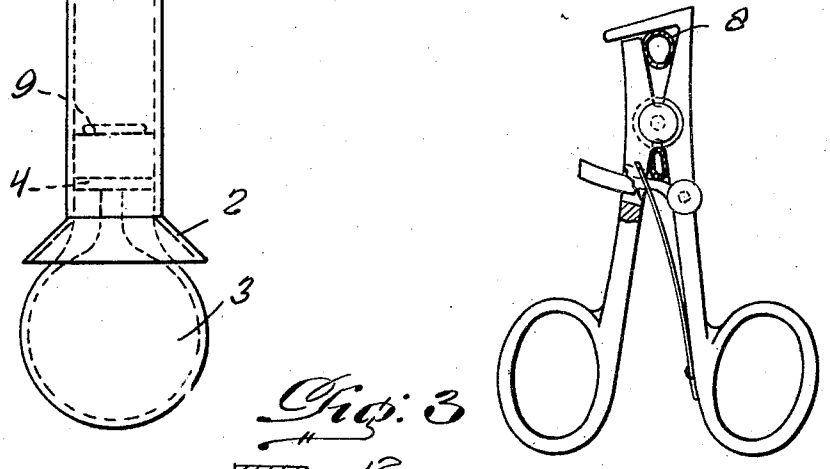
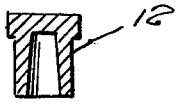


Fig. 3



Inventor
M Shaweker;

By Clarence A. O'Brien
Attorney

Patented Dec. 14, 1926. 1,610,622

UNITED STATES PATENT OFFICE.

MAX SHAWEKER, OF DOVER, OHIO.

BLOOD-TRANSFUSION MEANS.

Application filed August 11, 1926. Serial No. 128,608.

My invention has to do with blood transfusion, and contemplates the provision of highly efficient blood transfusion means possessed of the practical advantages hereinafter ascribed to the same.

To the attainment of the foregoing, the invention consists in the improvement as hereinafter described and definitely claimed.

In the accompanying drawing forming part of the specification:—

Figure 1 is a view, partly in elevation, and partly in section, showing blood transfusion means constructed in accordance with my invention, in association with a cut off.

Figure 2 is a section taken on the plane indicated by the line 2—2 of Figure 1 looking in the direction of the arrow.

Figure 3 is a diametrical section of one of the adapter cups hereinafter explicitly referred to.

Similar numerals of reference designate corresponding parts in all the views of the drawing.

Among other elements, my novel means includes a syringe barrel 1, preferably of glass, having a nipple $1^{\times}$ at one end and also having, by preference, a flared flange 2 at its opposite end. A compressible bulb 3, preferably of vulcanized rubber, is connected to the barrel 1 within the same and at a point adjacent to the flanged end of the barrel as designated by 4 in Figure 1.

Mounted on the nipple $1^{\times}$ of the barrel is a coupling 5 having divergent arms 6 to which are connected at 7 in appropriate manner compressible hose sections 8 of rubber or other appropriate material.

Movable in the barrel 1 is a floating plunger 9 preferably of glass.

The hose sections 8 are equipped at their forward ends with nozzles 10 for the application of needles 11 of tubular type, and at this point I would have it understood that when the means is not in use and the needles 11 are removed from the nozzles 10, the said nozzles 10 may be and preferably are closed by traps 12 such as shown in Figure 3.

I show properly arranged in Figures 1 and 2 an ordinary Chetwood cut-off, the same being designed to be used as the valve in the use of my improved means, and in this connection I would have it understood that compression of the hose sections 8 may be effected through the medium of fingers of an operator without affecting my invention. In either case it will be understood that the compression means is entirely exterior of the tubing or hose sections 8 and does not interrupt the smooth walls at the insides of the hose sections 8. The practical advantage of this will be appreciated when it is stated that the fibrin in the blood is rather easily beaten out, and that therefore the blood should not be passed through small valves or over rough or uneven surfaces, but on the other hand the blood should be allowed a free flowing motion. In this connection it will be appreciated that the coupling 5 and the nozzles or adapters 10 are characterized by large bores for the free flowing of blood as distinguished from squirting. In fact, in the use of my novel means the only point where the blood is moved rapidly is in the needles 11, and in this connection I would say that I have found it advantageous to use the largest type of needle that it is feasible to employ in the particular case in hand.

My improvement is also designed to overcome the tendency of blood to adhere to the barrel and give rise to trouble from clotting of blood or sticking of the plunger 9. In my improvement I disclose a five per cent sodium citrate solution in the bulb of syringe, the floating plunger 9 being disposed betwen said solution and the blood in the barrel. In consequence of this with each barrel of blood that is transfused, the side walls of the syringe will be moistened with the citrate and in that way clotting of blood in the barrel is precluded where the flow of blood is relatively slow and clotting thereby favored. It will be understood here that the citration occurs without cessation of the transfer of blood from donor to the recipient, the floating plunger 9 rising and falling with the transfer of each 15 c. c. of blood, for instance, and the citrate and blood being kept from mixing except for the small amount of citrate which adheres to the wall of the barrel.

The practical advantages following from the use of the nozzles 10 and caps such as 12 in Figure 3 will be appreciated when it is stated that by filling the barrel 1 and tubing of my improved means with isotonic salt solution and the bulb 3 with a five per-cent citrate solution before starting the transfusion and applying the caps 12 to the nozzles

10, there is no danger of air or bacteria entering the apparatus until the caps 12 are removed and the nozzles 10 are connected up to the needles in the veins.

In the foregoing connection I would have it understood that manifestly my improved means may be sterilized and prepared in the manner indicated in the office of the physician if desired, and the means so prepared may be conveniently transported in readiness for immediate use when occasion demands.

It will be understood from the foregoing that there are no valves of any kind within the lumen of my novel means, this being materially advantageous for the reason before stated. It will also be understood that my novel means is characterized by large bores throughout and hence there is no place in the improved means where blood is forced with undue pressure other than through the needles 11, and hence the blood is given more of a flowing action than a churning action. Again, it will be understood that the syringe is susceptible of being operated through the medium of one hand, and that the barrel of the syringe is moistened with saline and citrate solution on each delivery on a barrel of blood to a recipient. The saline and citrate solution being back of the floating plunger 9 which keeps it from mixing freely with the blood, and upon release of the bulb after the recipient has received 15 c. c. of the donor's blood, the plunger 9 retires the citrate in the barrel 1 to the bulb 3.

I have explicitly described the present and preferred embodiment of my invention in order to impart a full, clear and exact understanding of the said embodiments in all its details. I do not desire, however, to be understood as limiting myself to the structure disclosed, my invention being defined by my appended claims within the scope of which structural changes may be made without departure from my invention.

Having thus described the invention, what I claim is:—

1. Blood transfusion means comprising a syringe barrel, a compressible bulb connected with the interior of the barrel, a floating plunger disposed in said barrel, and compressible tube sections connected with the barrel; said tube sections being susceptible of compression through the medium of a cut off or by hand and being equipped for the connection therewith of tubular means.

2. Blood transfusion means comprising a syringe barrel, a compressible bulb connected with the interior of said barrel, a floating plunger in said barrel, compressible hose tube sections connected together and with the barrel and adapted to be closed by compression exteriorly applied, nozzles at the forward ends of said hose tube sections for connection to tubular needles, and removable caps for closing said nozzles when the tubular needles are disassociated from the nozzles.

In testimony whereof I affix my signature.

MAX SHAWEKER.