March 3, 1936. N. M. GUIOU 2,032,614

BLOOD TRANSFUSION APPARATUS

Filed July 3, 1933 2 Sheets-Sheet 1

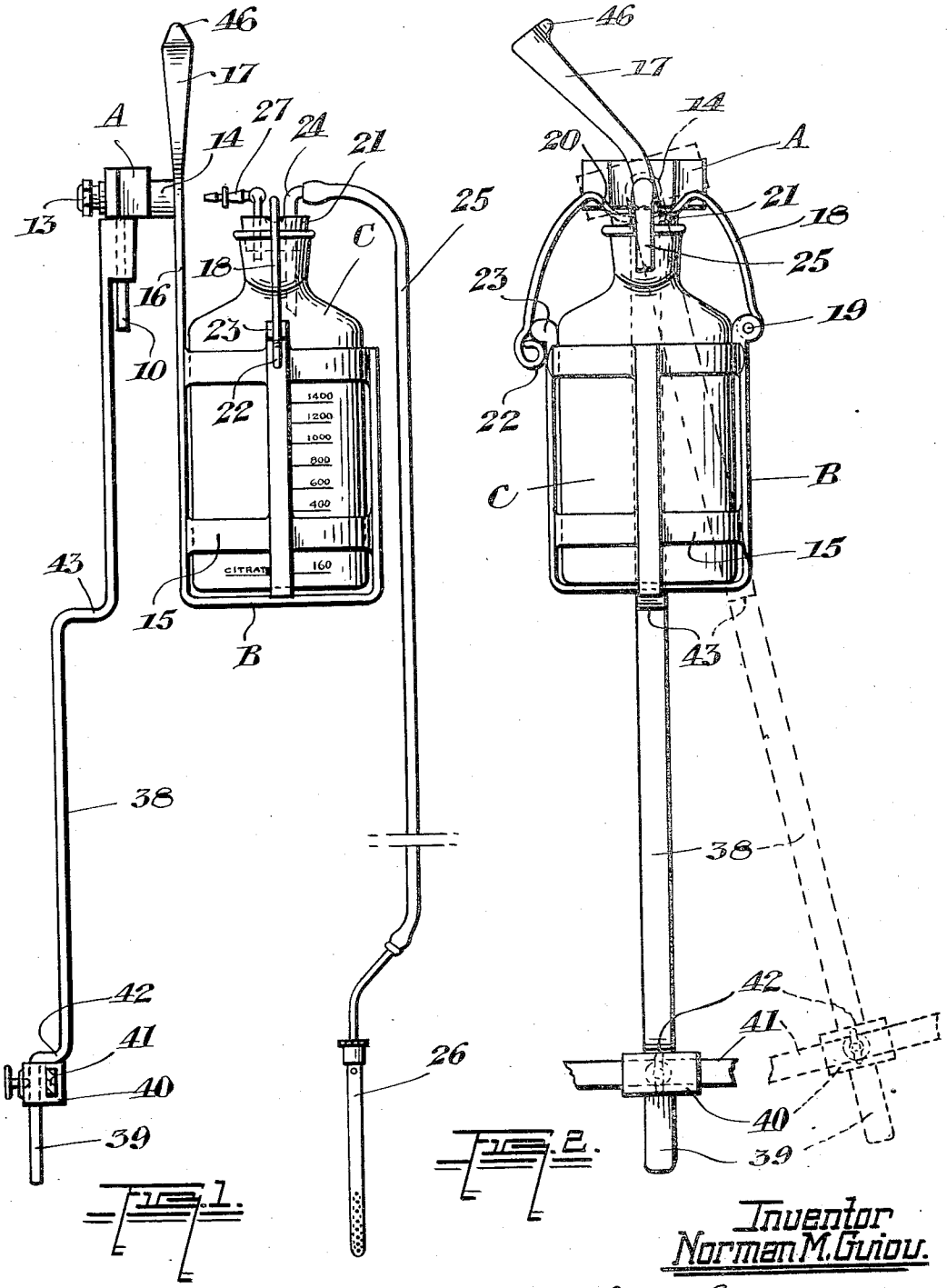


Fig. 1.

Fig. 2.

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BLOOD TRANSFUSION APPARATUS

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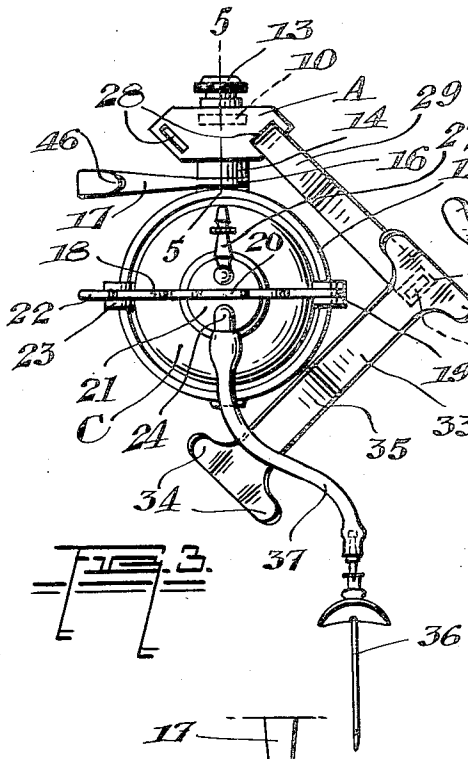


FIG. 3.

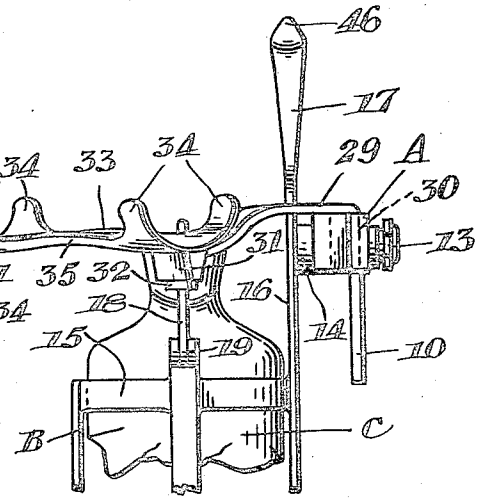


FIG. 4.

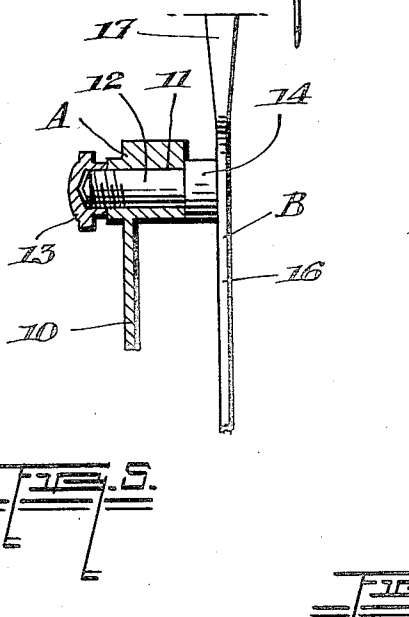


FIG. 5.

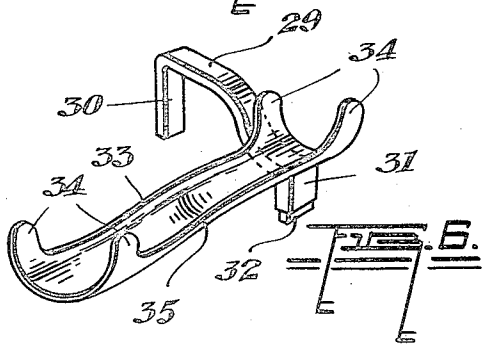


FIG. 6.

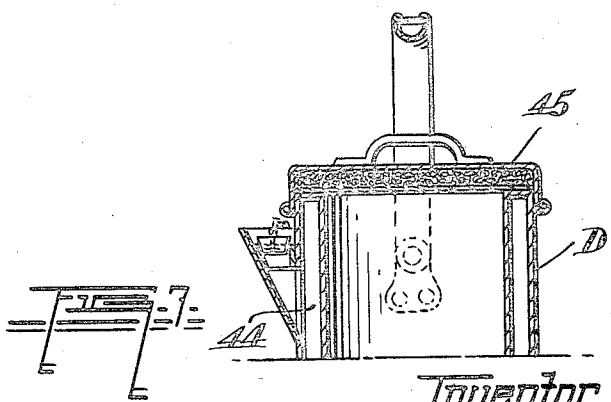


FIG. 7.

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BLOOD TRANSFUSION APPARATUS

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Application July 3, 1933, Serial No. 678,938

2 Claims. (Cl. 128—214)

This invention relates to blood transfusion apparatus particularly auto transfusion.

An object of the invention is to provide an apparatus of this character which may be readily adapted to the various uses within this field and which is readily mountable on an operating table or the like.

A further object of the invention is to provide an apparatus of this character which will provide for a mixing of the blood with an anticoagulant in a very simple, noiseless and convenient manner.

A still further object of the invention is to provide an apparatus wherein the blood container may be held firmly in its mounted position and readily removed.

A still further object of the invention is to provide for the use of a closed system wherein the blood may be taken care of under aseptic conditions.

With these and other objects in view the invention consists essentially in a fitting carrying a container mounting such that said mounting is swingable with respect to the fitting, the container mounting providing for holding a container firmly and the fitting being adapted for attachment direct to an operating table or support, or a standard carried thereby, while providing for the mounting thereon of suitable attachments for arm bleeding, as more fully described in the following specification and illustrated in the accompanying drawings which form part of the same.

In the drawings,—

Figure 1 is a side elevation of the improved apparatus illustrating the container carried within the container mounting and the fitting mounted in a standard carried for instance, in the bracket of an operating table.

Figure 2 is a front elevation of Figure 1 with the suction tube broken away and also illustrating in dotted lines the position of the standard and the relative position of the container mounting when the operating table may be tilted.

Figure 3 is a plan view of the fitting and container mounting showing the container therein, the fitting carrying an attachment holding an arm rest in a position adjacent to the container.

Figure 4 is a side elevation of Figure 3 with the container mounting and jar shown fragmentarily.

Figure 5 is a vertical section taken on the line 5—5 of Figure 3 through the fitting showing the manner in which the container mounting is carried.

Figure 6 is a perspective view of the arm rest and holding bracket and,

Figure 7 is a fragmentary sectional view of a jacket container for carrying the blood container when it is being transported to the patient.

Referring more particularly to the drawings, A indicates the fitting, B indicates the container mounting and C indicates the container. The fitting A comprises preferably a block of metal which is suitably shaped, having regard to compactness and strength and is provided with a shank 10 or other suitable member for mounting the fitting in a holder. The fitting is preferably bored as at 11 (see Figure 5) and is designed to receive therethrough the stub shaft 12 of the container mounting B which projects laterally therefrom and is rotatably secured within the fitting A by means of the securing member 13, the stub shaft 12 being provided with an enlarged portion 14 which has a bearing surface engaging a side of the fitting. The container mounting is constructed preferably in the form of a framework 15 to receive therewithin the container C, the framework in the preferred embodiment carrying an upwardly projecting member 16 which carries the stub shaft 12 and preferably terminates in a lever handle 17. In other words, the upwardly projecting member with the handle 17 constitutes a lever and it will be realized that upon grasping the lever handle 17 and oscillating it, the container mounting may be oscillated with respect to the stationary fitting. It will also be realized that the container mounting might be attached to the fitting without the use of such lever construction so that by providing on the framework proper, a suitable handle or gripping means the container mounting may likewise be oscillated.

The container C once set within the container mounting B may be secured therein by any suitable means. Ordinarily in citrate method blood transfusion work it has been the practice to use an open container carrying an anticoagulant such as isotonic citrate solution with which the blood introduced to the container is mixed by means of suitable stirring rod or the like. This arrangement, is not conducive to a complete aseptic condition and therefore the present arrangement provides a completely closed vessel and a complete admixture of blood and anticoagulant by oscillation of the container through the container mounting. Thus the anticoagulant and blood is thoroughly mixed in a very simple manner, while the means for securing the container may take the form of an arrangement whereby the stopper for the container is simultaneously held in its proper position. The se-

curing member, as illustrated, takes the form of a resilient member 18 preferably steel wire or the like, which is pivotally mounted as at 19, on one side of the container mounting, depressed as at 20 where it contacts with the stopper 21 of the container C and terminates in a protruding end 22 such as a ring which is designed to snap under a boss 23 carried on the container mounting B. In this way the container is held firmly within its mounting while at the same time the stopper is firmly held in the container. Through the stopper 21 an elbow tube 24 is designed to project which is connected to tubing 25 which may carry a suitable attachment according to the use to which the apparatus is being put. In Figure 1 the tubing is shown connected to an abdominal suction tip 26. Also projecting through the stopper 21 is a tube and nipple structure 27 which is designed to be connected through tubing to suction apparatus whereby when suction is applied the blood may be drawn through the tubing 25 into the container C. The outwardly projecting parts of the nipple 27 and elbow tube 24 are disposed in axial alignment, it will be noted, their axis also being in line with the axis of stub shaft 12, as hereinafter referred to.

The fitting A (see Figure 3) is provided with a pair of slots 28 at each end which are designed to receive suitable attachments to facilitate the operation being carried out. These slots are arranged so that the fitting may be used to support either arm of a donor during removal of blood therefrom. A bracket 29 formed with a shank 30 (see Figure 6) is mounted in one of the slots 28 and projects from the fitting. This bracket terminates in a socketed portion 31 to receive the shank 32 of an arm rest 33, the arrangement being such that the arm rest projects adjacent to the container C. The arm rest is provided with the upwardly curved lugs 34, the body portion 35 being of channel form longitudinally and transversely curved to fit the shape of the arm as shown.

With this arrangement instead of having to provide suitably arranged towels and the like upon which to lay the arm of the donor, the donor lying on the operating table can rest his arm upon the arm rest 33 in a very natural manner, it being held relatively to the container so that the transfusion needle 36 carried by the tubing 37 is readily at hand and with the arm firmly supported in this natural manner the operation in question is greatly facilitated. At the same time it will be noted that as the arm rest is held stationary and firmly supports the arm, the container may be oscillated so as to mix the anticoagulant thoroughly with the blood introduced to the container. The oscillation of the container, on the other hand, will not interfere with the operation in that the tubing 37 is hardly disturbed due to the alignment of the elbow 24 and nipple structure 27 with the axis of the stub shaft 12 which positions the former members at dead center of motion. In this form of operation the shank 10 of the fitting A is mounted directly within a bracket on the operating table such that the fitting and container are held to one side of the operating table and substantially at the level thereof.

In the case where the apparatus is used for auto transfusion during an operation wherein the suction tip such as 26 is used, on the tubing 25, as illustrated in Figure 1, the fitting A is carried on a suitable standard 38 which is formed with a shank 39 mounted in a bracket 40 on the operating table, the bracket being slidable on a bar 41 so that the apparatus may be supported at any suitable point along the length of the table. The standard 38 is preferably offset as at 42 and 43 such that it projects somewhat over the operating table and provides for holding the container directly over the patient so that it is conveniently placed for the operation being performed. In this position the container is in full view of the surgeon for checking the amount of blood received, it is easily accessible for oscillation by the interne or assistant, while, being so mounted is out of the way and will not interfere with the surgeon.

In many cases, owing to the condition of the patient or for other reasons it is necessary that the operating table be tilted and in this case the standard 38 would be necessarily positioned at an angle, as shown in dotted lines in Figure 2. It will be noted, however, on referring to this view that having regard to the swingable connection between the container mounting and the fitting A, that the container C is always held in a vertical position, and thus the apparatus adapts itself to conditions prevailing.

In using the apparatus for auto transfusion during an operation the structure illustrated in Figures 1 and 2 is mounted on the operating table or other suitable support and the suction tip is introduced to the body cavity containing the blood. By applying suction the free blood in the body cavity is drawn into the container. During this time the interne or one of the assistants will, through the lever handle 17 or other suitable arrangement provided, oscillate the container so that the blood received therein will be thoroughly mixed with the anticoagulant which was preliminarily introduced to the container. Thus the blood is thoroughly mixed and kept from clotting in a very simple and noiseless manner without the necessity of employing a stirring rod and requiring a systematic stirring. On the completion of the operation the container may be readily removed from its mounting, the stopper 21 removed and a pliable aseptic rubber cap immediately slipped over the neck of the container. When this has been done the blood container may be introduced to the jacketed container or blood warmer D illustrated in Figure 7, which carries hot water introduced into the jacket 44 and the container D is then closed with the insulated cover 45 so that it may be transported down to the patient's room in proper condition to be returned to the patient. This container is also employed for transporting blood from the operating room to the patient's room in the case of donor transfusion.

In donor transfusion, as previously referred to, the standard 38 is omitted and as shown in Figure 4, the fitting A alone is used, it being mounted directly on the table or other mounting used in the operation. The use of this apparatus in this phase of operation is exactly similar, the container being held in the same way and the blood received and mixed with the anticoagulant in a similar manner. Other means may well be employed to provide for oscillation of the container and as stated, it is not necessary to use the lever arrangement shown. However, this construction is preferred as convenient in that the lever handle 17 projects clearly from the apparatus so as to provide very convenient means to effect oscillation, while, according to the preferred form the lever is provided with a projecting boss

46 to provide for a firm grip and as this handle provides a very convenient means for carrying the apparatus the boss will also serve to provide against accidental dropping of the apparatus, as might possibly occur when being handled with wet rubber gloves.

It is apparent from the foregoing that I have provided a simple aseptic closed system for the performance of autotransfusion which is readily adaptable for aseptic citrate donor transfusion providing a standardized apparatus for both these procedures.

Various modifications may be made in this invention without departing from the spirit thereof or the scope of the claims, and therefore the exact forms shown are to be taken as illustrative only and not in a limiting sense, and it is desired that only such limitations shall be placed thereon as are disclosed in the prior art or are set forth in the accompanying claims.

I claim:—

1. Blood transfusion apparatus, comprising an oscillatable pivotally supported container mounting, a closed container carried by said mounting, an elbow tube projecting from said container, tubing connected to said elbow, one arm of said elbow tubing having its axis in line with the pivotal axis of the container mounting.

2. Blood transfusion apparatus, comprising a fitting having a slot therein, an oscillatable container mounting swingably carried by said fitting, a bracket mountable in the slot of said fitting to project therefrom and an arm rest mountable on said bracket to project adjacent to said container mounting.

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