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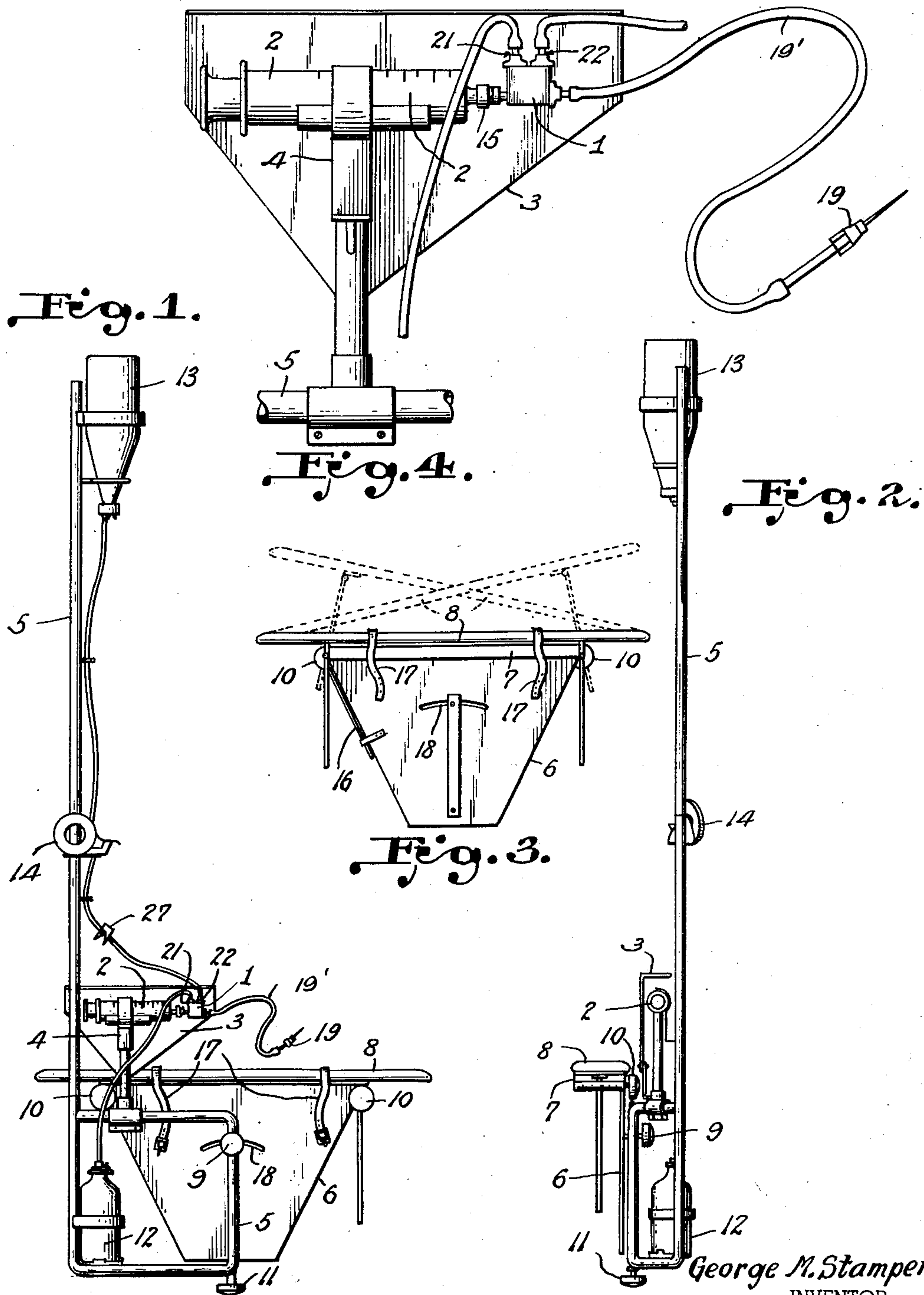
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2,710,004

APPARATUS FOR ADMINISTERING INTERVENOUS ANESTHETICS

Filed Oct. 11, 1951

2 Sheets-Sheet 1



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Fig. 5.

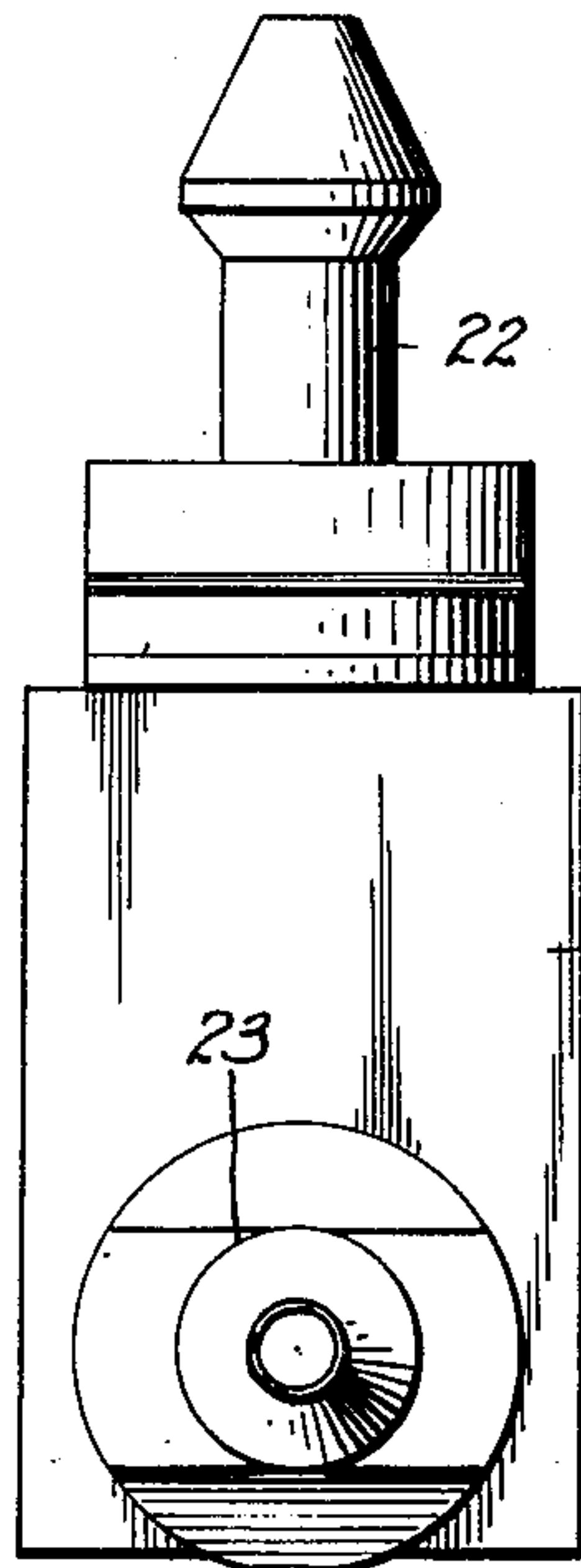


Fig. 6.

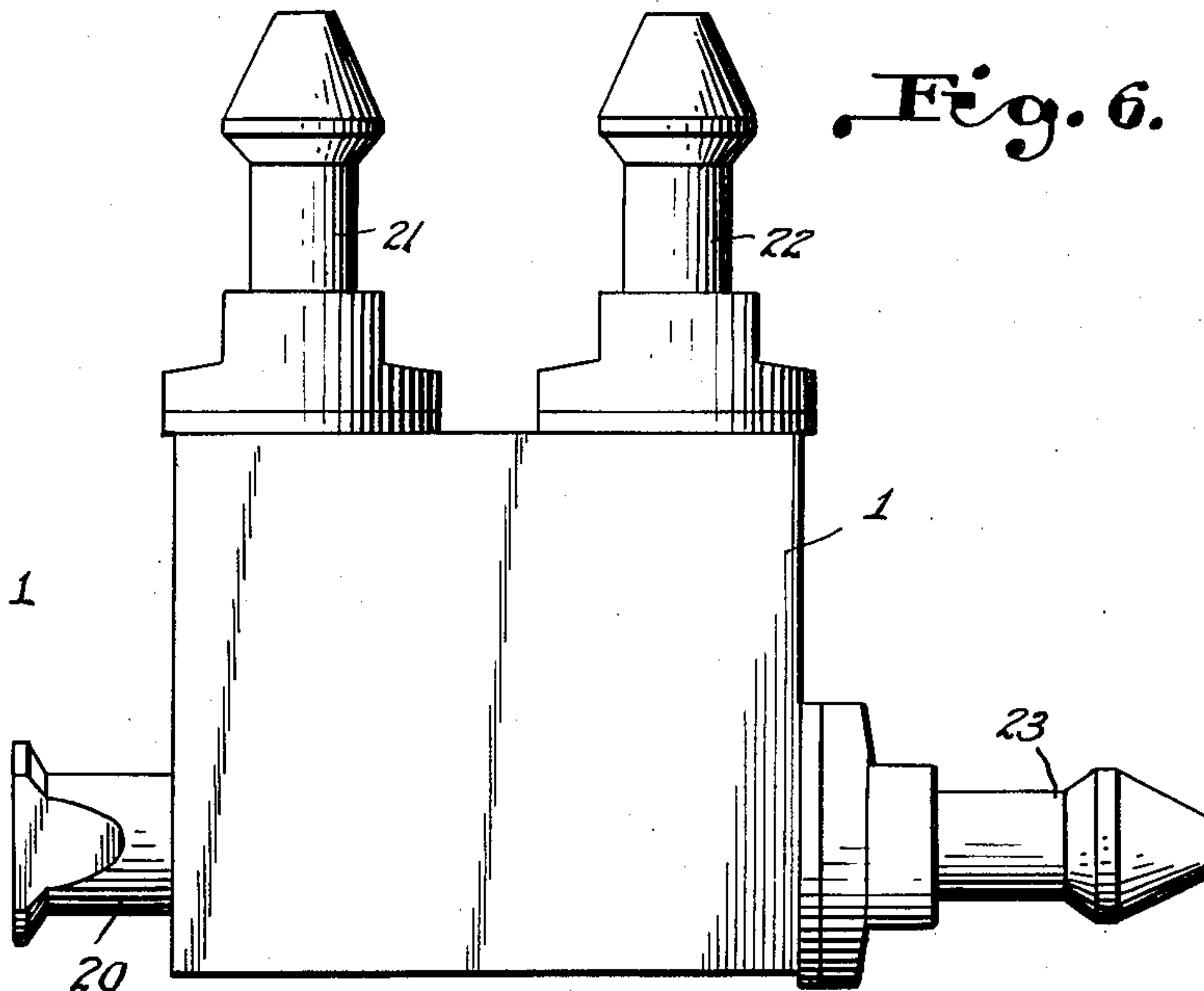


Fig. 7.

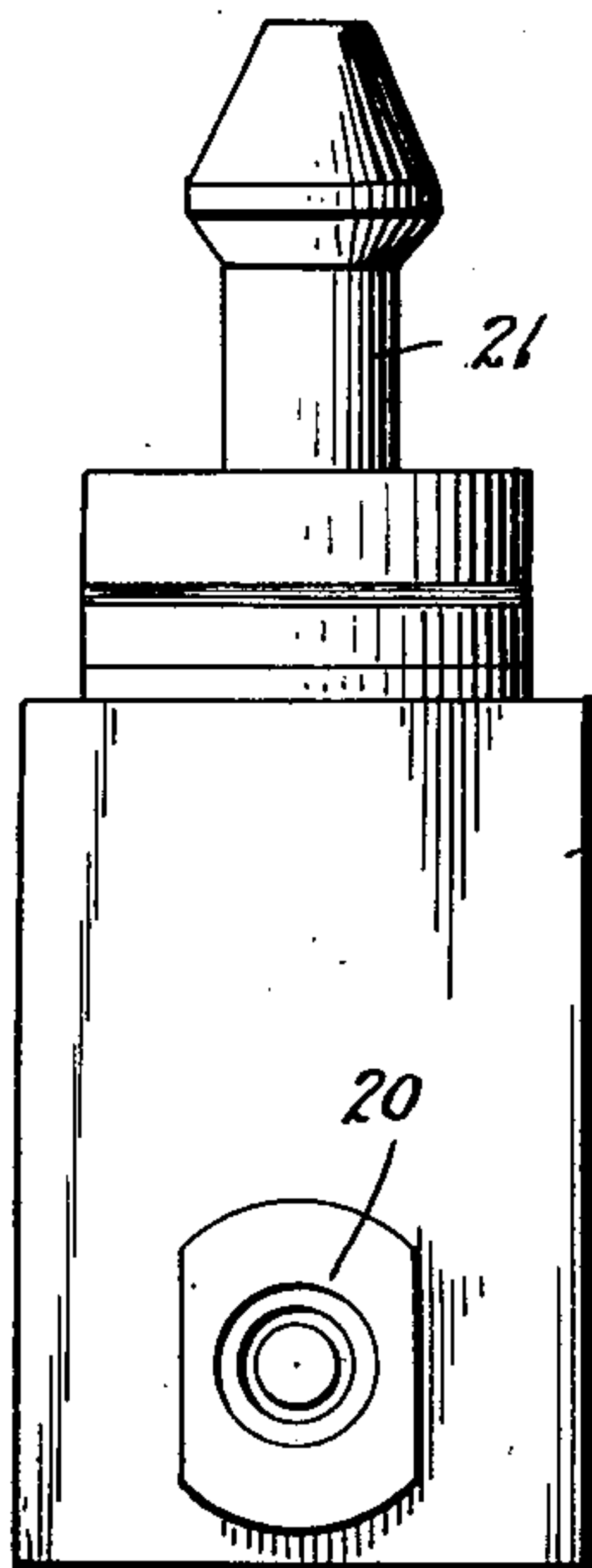
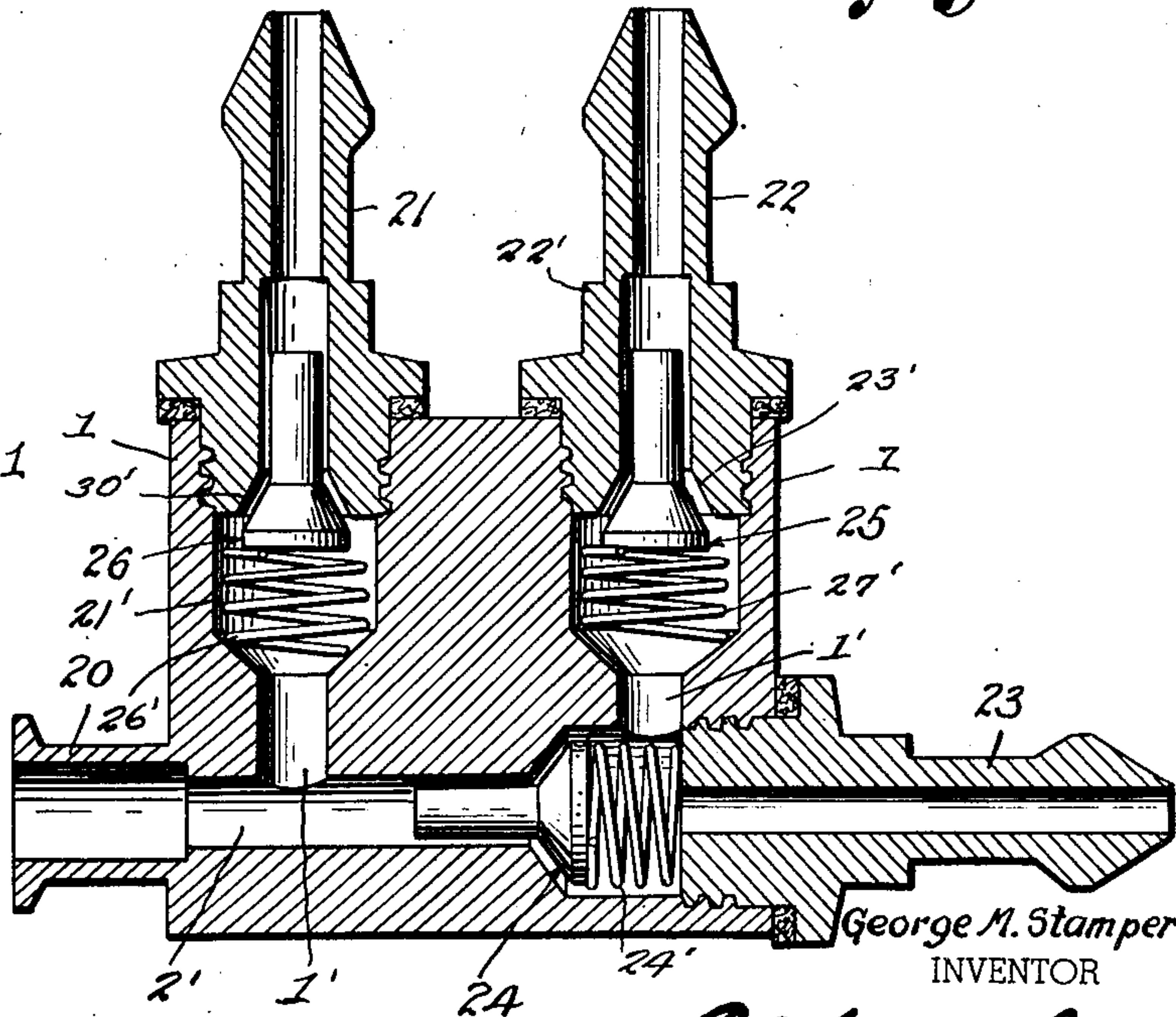


Fig. 8.



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APPARATUS FOR ADMINISTERING INTERVENOUS ANESTHETICS

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2 Claims. (Cl. 128—214)

This invention relates to the administering of inter-venous anesthetics to human beings; that is, the injection of anesthetics into the veins by means of a surgical needle. The objects of the improvement are, first, to provide for the use of only one needle through which passes both the anesthetic and the infusion solution, independently of one another; and, second, to provide a means of administering intervenous anesthetics that has a minimum physiological and psychological effect on the patient.

The form of the entire apparatus is illustrated in the accompanying drawings, as follows:

Figure 1 is a front view of the entire apparatus.

Figure 2 is a side view of the entire apparatus.

Figure 3 is a detailed rear view of the parts numbered 6, 7, 8, and 10, Figure 1, showing both the raised and lowered positions of the elevating arm rest 8, it being elevated from either end.

Figure 4 is an enlarged detailed view of the parts numbered 1, 2, 3, 4, 15, and 19, Figure 1.

Figure 5 is an enlarged right end view of the three way valve 1, Figure 4.

Figure 6 is an enlarged front view of the three way valve 1, Figure 4. The rear view is similar.

Figure 7 is an enlarged left end view of the three way valve 1, Figure 4.

Figure 8 is a detailed cross sectional view of Figure 6.

Although the apparatus described herein is designed for use on a dental chair, it should be understood that with certain modifications it can be adapted for use on operating tables, et cetera.

The entire apparatus is attached to a chair adapter 6, of which an arm rest bracket 7 rests on either the right or left arm of the dental chair. The entire apparatus is held firmly to the dental chair arm by means of a clamp 16 which secures the arm rest bracket 7 to the arm of the dental chair. By loosening an arm knob 10 the elevating arm rest 8 can be elevated to the proper level for the arm of the patient to rest comfortably while receiving the anesthetic. An arm strap 17 at either end is to hold the arm of the patient firmly to the elevating arm rest 8. There is an arm knob 10 at either end in order to afford the apparatus being placed on either the right or left arm of the dental chair. After the elevating arm rest 8 is raised to the proper level, it is firmly locked in place by tightening arm knob 10.

The frame 5 is bolted to the chair adapter 6 and can be adjusted by an upper adjusting knob 9. The entire frame 5 can be moved from one end of the slot 13 to the other by loosening the upper adjusting knob 9, moving the frame attachment through the slot 13, and tightening the upper adjusting knob 9. This feature is so designed to allow the frame 5 and all its attachments to be vertical when the apparatus is on either the left or the right arm of the dental chair. A lower adjusting knob 11 affords means for effecting swinging movement of the frame 5 to the left or right, depending again on whether the apparatus is on the right or left arm of the dental chair. An anesthetic reservoir 12 rests on the base of

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the frame 5 on a padded holder and is held firmly in place by a metal band. An infusion solution container 13 is located at the top of the frame 5 and the neck of the container 13 rests in a metal holder and a metal band fits around the body of the container. An adhesive cellulose tape dispenser 14 is also located on the vertical part of the frame 5.

The syringe-valve group Figure 4 is attached to the frame 5 by a metal sleeve which is bolted to the frame 5. The syringe 2 itself is held firmly in place in its rack by means of a spring loaded clip 4. A syringe guard 3 is mounted on a swivel which allows it to be pulled aside whenever the anesthetist so desires. The purpose of this syringe guard 3 is to keep the large 50 cc. syringe from being seen by the patient. The three way valve body 1 is attached to the end of the syringe 2 by a lock nut adapter 15 which engages a syringe inlet 20, a part of the three way valve 1. The valve body 1 is formed with vertical bores 1' that communicate with the horizontal bore 2' at the base of said valve body 1, the horizontal bore 2' being open at its ends. The needle 19 is attached to the three way valve 1 by a rubber or plastic tube. A tube also runs from the infusion solution container 13 to the infusion solution inlet 22 located in the valve housing 22', having valve seat 23', shown in Figure 8. Another tube runs from the anesthetic reservoir 12 to an anesthetic inlet 21 located in the valve housing 21', Figure 8.

Now that the various parts and their locations have been pointed out, the operation of the entire apparatus will be described, including the operation of the three way valve 1, around which the whole system operates.

Before an operation is to be performed the anesthetist draws the desired amount of anesthetic from the reservoir 12 by operating the graduated syringe 2. The anesthetic is drawn from the reservoir 12, which passes through the tube into the valve through the anesthetic inlet 21 through valve housing 21' having valve seat 30' and into the syringe 2. The anesthetic inlet 21 contains a vertical rubber valve 26 normally open and resting on a spring 26' which allows the anesthetic to pass through the valve when the piston of the syringe 2 is pulled back, and in turn the anesthetic passes into the syringe. After the patient has been placed in the dental chair, his or her arm strapped to the elevating arm rest 8, and the needle 19 placed in the vein of the arm and the needle and tube held in place by a piece of adhesive cellulose tape from the dispenser 14, the anesthetist pushes in the piston of the syringe 2 causing the anesthetic to pass from the syringe 2 through the syringe inlet 20, through the valve 1 to the outlet 23, through the tube, through the needle 19, and into the vein of the patient's arm. Of course, the amount of anesthetic given is indicated by the graduations on the syringe 2. The needle 19 is 25 gauge and allows only a small stream to pass through it, thereby lessening the possibility of blocking the vein. In the meantime, the metal pincher 27 on the tube running from the infusion solution container 13 to the infusion solution inlet 22 has been released. As soon as the amount of anesthetic injected by the anesthetist has passed through the valve 1, and the pressure created thereby has subsided, the infusion solution begins to flow through the inlet 22 by force of gravity past valve 25 and passes through the valve 1, through the outlet 23, which also has a normally open horizontal rubber piston valve 24 mounted therein, said valve 24 being spaced from its seat 25' by a spring 24' secured to said valve, from which the solution passes, through the tube 19' and needle 19, and into the vein of the arm of the patient, the vertical infusion solution inlet valve 25 being so regulated by the particular tenseness of the spring 27' that the infusion solution comes out in such a quantity as to merely drip

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into the vein rather than flow in a steady stream. This dripping of the infusion solution keeps the needle 19 open and helps to prevent the blocking of the vein. At any time it is desired to add to the amount of anesthetic already given, the piston of the syringe 2 is pushed in further. Immediately, the infusion solution stops dripping, the infusion solution inlet valve 22 and the anesthetic inlet 21 becoming closed by the pressure of the anesthetic flowing through the syringe inlet 20 and through the outlet 23. Again, as before, as soon as the anesthetic passes through and the pressure thereby subsides, the inlet valve 22 again opens and the infusion solution drip begins again.

The advantage of having the apparatus attached to the dental chair rather than be on a floor stand is that when the dental chair is raised or lowered by its hydraulic jack, the entire anesthetic apparatus maintains its same level in relation to the patient in the chair.

I am aware that prior to my invention anesthetics have been administered intervenously by syringe and needle combinations. I, therefore, do not claim such a combination broadly. I do not claim as an invention the standard surgical instruments included in the apparatus such as the rubber tubing, syringe 2, bottle containers 12 and 13, arm straps 17, needle 19, lock nut adapter 15, and knobs 9, 10, and 11, but I claim:

1. An anesthesia administering apparatus including a needle, comprising a body having spaced vertical bores extending inwardly from one surface thereof, valve housings having valve seats, formed in said bores, said body having a horizontal bore communicating with said vertical bores, said horizontal bore having a valve housing, spring supported normally open, mounted within said valve housings, tubes establishing communication between said vertical bores and independent sources of liquid supply, a tube providing communication between one end of said horizontal bore and such needle, a syringe

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connected to the other end of said horizontal bore, and said syringe operating to open the valves in the vertical bores drawing liquid into said horizontal bore upon the suction stroke only of said syringe forcing the liquid through the horizontal bore against the action of the spring valve operating therein, into said needle.

2. An anesthesia administering apparatus, including a needle, comprising a body having spaced vertical bores extending inwardly from one surface thereof, vertical valves mounted within said bores, springs within the bores secured to said valves normally holding said valves open, tubes providing communication between the bores and independent sources of liquid supply, said body also having a horizontal bore communicating with said vertical bores, one end of the horizontal bore constituting the inlet of said body, a valve seat in said horizontal bore between said vertical bores, a spring pressed horizontal valve operating in said horizontal bore normally held open by said spring, a syringe adapted to create suction at one end of said horizontal bore further opening said vertical valves and closing said horizontal valve simultaneously, and said horizontal valve being moved to its open position simultaneously with the closing of the vertical valves under pressure directed to the horizontal bore, forcing liquid from said body and needle.

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