

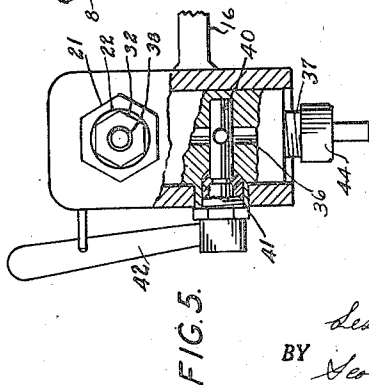
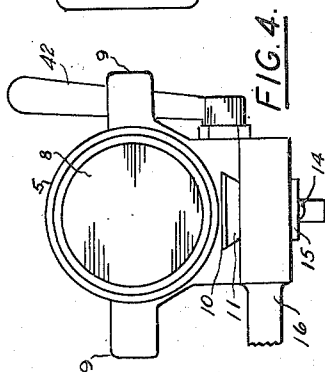
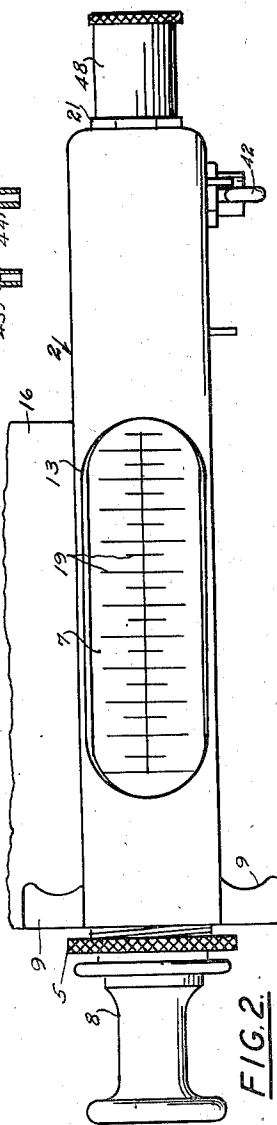
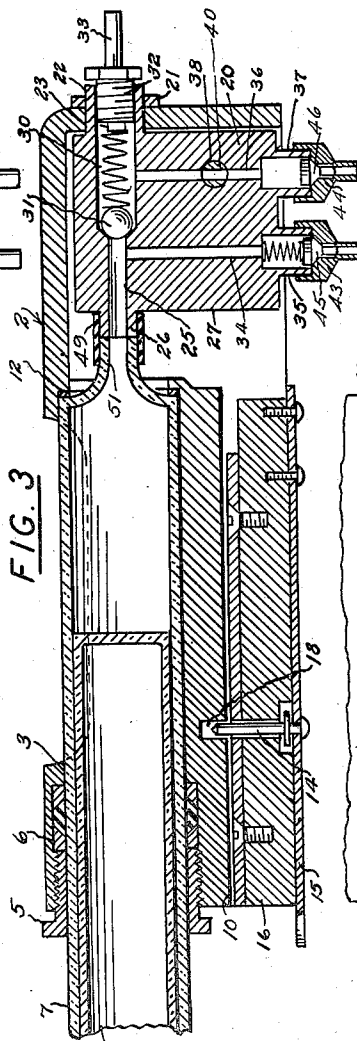
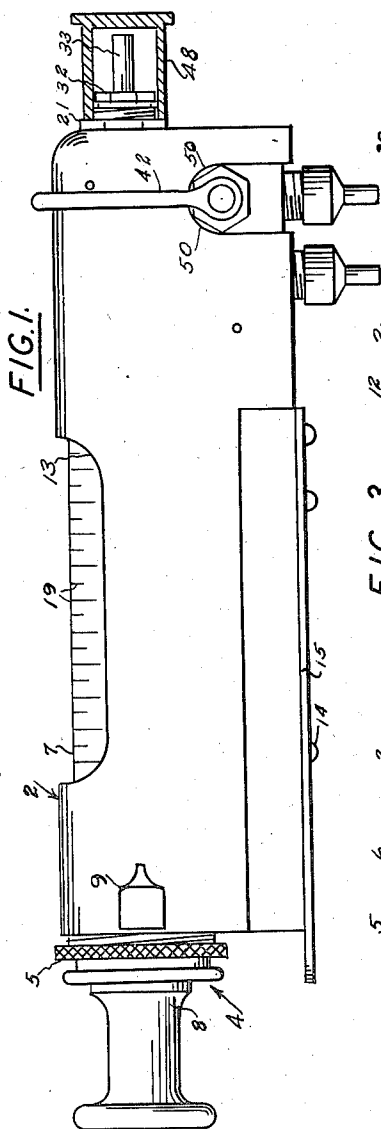
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L. B. STALLCUP

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CONTROL SYRINGE

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INVENTOR.
Lester B. Stallcup
BY Scott L. Norviel
Atty.

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CONTROL SYRINGE

Lester B. Stallcup, Phoenix, Ariz.

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3 Claims. (Cl. 128-218)

1

This invention pertains to control syringes for the intravenous administration of anesthetics.

While the advantages of administering pentothal sodium as an anesthetic intermittently thru a single venipuncture and of keeping the needle and other passageways open by a continuous flow of saline solution has been heretofore recognized, little has been done to provide specialized apparatus to efficiently attain the results desired. Heretofore where anesthetics were administered intravenously only ordinary standard syringes and attendant apparatus have been available.

One of the objects of this invention is to provide apparatus by which controlled and indicated dosages of anesthetics may be administered intravenously by a syringe and mixed with, or preceded, or followed by saline injection supplied under pressure.

Another object of the invention is to provide a holder for a hypodermic syringe arranged so that measured quantities of fluid anesthetic may be drawn into it, injected thru a needle, and immediately thereafter a saline wash solution will flow thru the needle to keep it from clogging.

A still further object is to provide a holder for a hypodermic syringe adapted to be supported on an arm rest attached to an operating chair as illustrated in my co-pending application Serial Number 658,659, Patent Number 2,418,561, April 18, 1947, combined with a system check valve and a manual cut-off valve connected so that fluid anesthetic may be drawn from a container, forced in measured quantities thru the needle into portions of the patient's body, and immediately thereafter a neutral solution can be flowed thru the needle to keep it clear of clogging and supplant blood losses.

Other objects will appear hereinafter.

I attain the foregoing objects by means of the devices shown in the accompanying drawings in which

Figure 1 is a side elevation of a control syringe embodying my improvements;

Figure 2 a plan view thereof;

Figure 3 a sectional elevation of same;

Figure 4 an elevational view of the outer end of the device, and

Figure 5 an elevation of the inner end with portions broken away to show interior construction.

Similar numerals refer to similar parts in the several views.

The term "control syringe" refers to the entire device here concerned, and includes, a standard hypodermic syringe as one of the operative parts.

2

The syringe and the other attendant elements are mounted in a case 2 made of cast metal and provided with a longitudinal bore 3 adapted to receive the hypodermic syringe 4. A threaded nut 5 and packing gland fitting 6 secure the outer end of the syringe barrel 7 in the case. The inner end of the barrel bears against a rubber ring 12 at the inner end of bore 3.

Finger grips 9 are formed on the outer end of the case adjacent the plunger 8 for convenient operation of the plunger so that measured quantities of anesthetic fluid can be injected or ejected by the syringe as indicated by the graduations 19 on syringe barrel 7, which is exposed by the elongated openings 13 in the top of the case.

Along the bottom of the case is a longitudinal dove tail groove 10 adapted to receive a corresponding slide 11 which may be part of a shelf 16 attached to an operating chair arm rest. (See my co-pending application, Serial Number 658,659.) A slide locking pin 14 carried on spring 15 on the underside of shelf 16 will retain case 2 from longitudinal movement on said slide by engagement in a hole 18 in the underside of groove 10.

A valve block 20 made of stainless steel is removably secured in the inner end of case 2 by a nut 21 threaded on a boss 22 which protrudes thru a hole 23 in the inner end of the case.

This block has a longitudinal horizontal bore 25 extending thru its upper portion aligned with the syringe tip 51 and extending from boss 26 on its inner face 27 adjacent the inner end of the syringe barrel to boss 22. Within counter-bore 30, in its outer portion, a spring loaded ball check valve 31 operates. A bushing 32 provided with an outlet nipple 33 to which a tube carrying a hypodermic needle may be attached closes the outer end of bore 30. A vertical hole 34 forming an anesthetic channel extends from a boss 35 on the bottom face of the block and joins the inner portion of longitudinal bore 25. A second and parallel vertical hole 36 forming a saline solution channel extends upward from a boss 37 and joins the counter-bore 30 beyond the ball check 31.

A transverse bore 38 extends inward from a boss 39 on the outer face of this block and bottoms just short of its inner side face. This bore intersects vertical hole 36, and is reamed to receive the cylindrical valve plug 40 which is held in place and made fluid tight at the outer end by gland bushing 41. The metal of valve plug 40 extends outward to form a boss which carries the handle 42.

Nipples 43 and 44 carrying check valves 45 and 46 are threaded onto bosses 35 and 37, and are adapted to receive rubber tubes leading to containers for anesthetic and saline solutions respectively. Nipple 43 may be termed the anesthetic nipple and 44 the saline solution nipple.

All metal parts which come in contact with saline solution are made of stainless steel. Other parts contacting solutions must be of substances impervious to them. Case 2 may be made of aluminum alloy as also are the parts of the arm rest shown.

In use the case is slid onto the arm rest guide from left to right (Figure 1) until the locking pin engages. Syringe 4 is attached to boss 26 by a rubber tube 49. Rubber tubes from solution containers are attached to nipples 43 and 44, and a rubber tube leading to hypodermic needle is attached to nipple 33. The tube connected to nipple 43 leads to a container of pentothal sodium, the tube connected to nipple 44 leads to a container holding a sterile saline solution. With the apparatus prepared as above stated, manual valve 40 is opened, the plunger 8 is withdrawn to draw anesthetic solution thru check valve 45 and hole 34. The plunger is then pushed in to force anesthetic solution past ball check valve 31 thru nipple 33 and the tube and hypodermic needle attached thereto. After this injective action saline solution will enter thru check valve 46, flow thru hole 36 and out thru nipple 33 to the hypodermic needle.

Thereafter, if additional dosage of anesthetic is needed, it is only necessary to further insert plunger 8. If necessary a fresh supply of anesthetic can be drawn into the syringe by an outward movement of plunger 8. In this operation fresh solution is drawn in thru valve 45 while flow of saline solution into the syringe thru bore 25 is prevented by check valve 31. Thereafter injection may again be made. Meanwhile the flow of saline solution thru valve 46 continues at all times when not backed up by the pressure of an injection. The flow of the saline solution keeps the needle and its attendant parts clear and free from clotting, and at the same time supplants fluid losses in the blood stream of the patient.

At the end of the operation the manual valve 40 is closed and the apparatus disconnected from the hypodermic needle and from the supply tubes. Lever 15 may then be depressed to disengage locking pin 14 and the entire case is slid outward and removed from the shelf 16. The cap 48 can then be attached to threaded boss 22 to protect the hypodermic tube nipple 33.

From the foregoing it will be seen that I have provided a simple and efficient control syringe unit which will hold a standard hypodermic syringe in a convenient position on an arm board on which the patient's arms rests during treatment, and which is easily disassembled for cleaning and sterilization. The entire valve block may be removed by unscrewing nut 21 on boss 22, removing tube 49 and dropping the block thru the bottom of case 2, with the boss carrying valve handle 4 dropping thru slot 50 in the side of the case.

The syringe barrel may be removed by loosening gland nut 5. Nipples 43 and 44 may be unscrewed from block 20 and the valves cleaned and sterilized. Since these valves are of standard construction no further detail as to their structure and operation is thought to be necessary.

The arrangement of parts, as described enables the user of the apparatus to administer pentothal-

sodium solutions intravenously over a considerable period of time and in quantities greater than the unit capacity of the syringe. This is particularly advantageous where dilution of the solution is indicated. The advantage of providing the controllable flow of saline solution will at once be apparent to those familiar with the art.

Since various alternate forms and modifications can be made to the several parts of the control syringe reasonably broad interpretation should be given to the following claims.

I claim:

1. A control syringe for intravenous administration of anesthetic solutions comprising, in combination a hypodermic syringe, a case adapted for attachment to an operative chair arm board, having a longitudinal bore means for securing said hypodermic syringe barrel therein so the scale thereon will be visible, a valve block having a main channel adapted to connect to the tip of said hypodermic syringe at its inner end and to a nipple adapted to carry a hypodermic needle tube at the outer end, an outwardly opening check valve therein, a channel having an inwardly opening check valve attached to a nipple adapted for connection to a solution of pentothal sodium, opening into said main channel behind said check valve therein, a channel having an inwardly opening check valve and a manually operated valve having a nipple at its outer end adapted for connection to a tube supplying saline solution, and opening into said main channel, outward from said check valve at its inner end.

2. Apparatus for intravenous administration of anesthetic including, in combination, a hypodermic syringe having a cylindrical barrel, a scale thereon and a stem at its outer end, a case having a longitudinal bore and a gland packing at its inner end adapted to removably retain said hypodermic syringe, and an opening along the top for viewing the syringe scale, a valve block positioned within the outer end portion of said case having a horizontal bore aligned with the stem of said syringe, an outwardly opening check valve therein, an outlet nipple at the outer end of said bore adapted for attachment to a rubber tube, an anesthetic nipple on the bottom of said block having an inwardly opening check valve connecting thru a hole to said horizontal bore on the inside of the check valve therein, a saline nipple having an inwardly opening check valve therein connecting thru a saline hole, to said horizontal bore beyond said check valve therein, a manually operated valve in said saline hole, together with a slide groove having a slide lock adapted for attachment to an operating chair arm rest shelf.

3. Apparatus for intravenous administration of anesthetic including in combination with a hypodermic syringe provided with a cylindrical barrel, a scale thereon and an axial stem, a case having means for attachment to an operating chair, a horizontal bore adapted to receive said hypodermic syringe barrel, a gland packing adapted to secure the inner end of said syringe barrel operable on the inner end of said case, a scale viewing window in the upper side thereof, and an annular shoulder to receive the outer end of said syringe barrel; a valve block retained in the outer end of said case having a horizontal bore aligned with said syringe stem, and connected therewith, an outwardly opening check valve therein, a tube nipple at the outer end of said bore, an angularly disposed channel connecting with said axial bore between said syringe and the check valve therein leading to a tube nipple on the outer face of said

block having an inwardly opening check valve therein, an angularly disposed channel thru said block connecting to said axial bore outward from said check valve therein and leading outward thru said block to its lower edge face and to a tube nipple having an inwardly opening check valve, and a manually operable plug valve operable in said channel between said check valve and its juncture with said axial bore.

LESTER B. STALLCUP.

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