

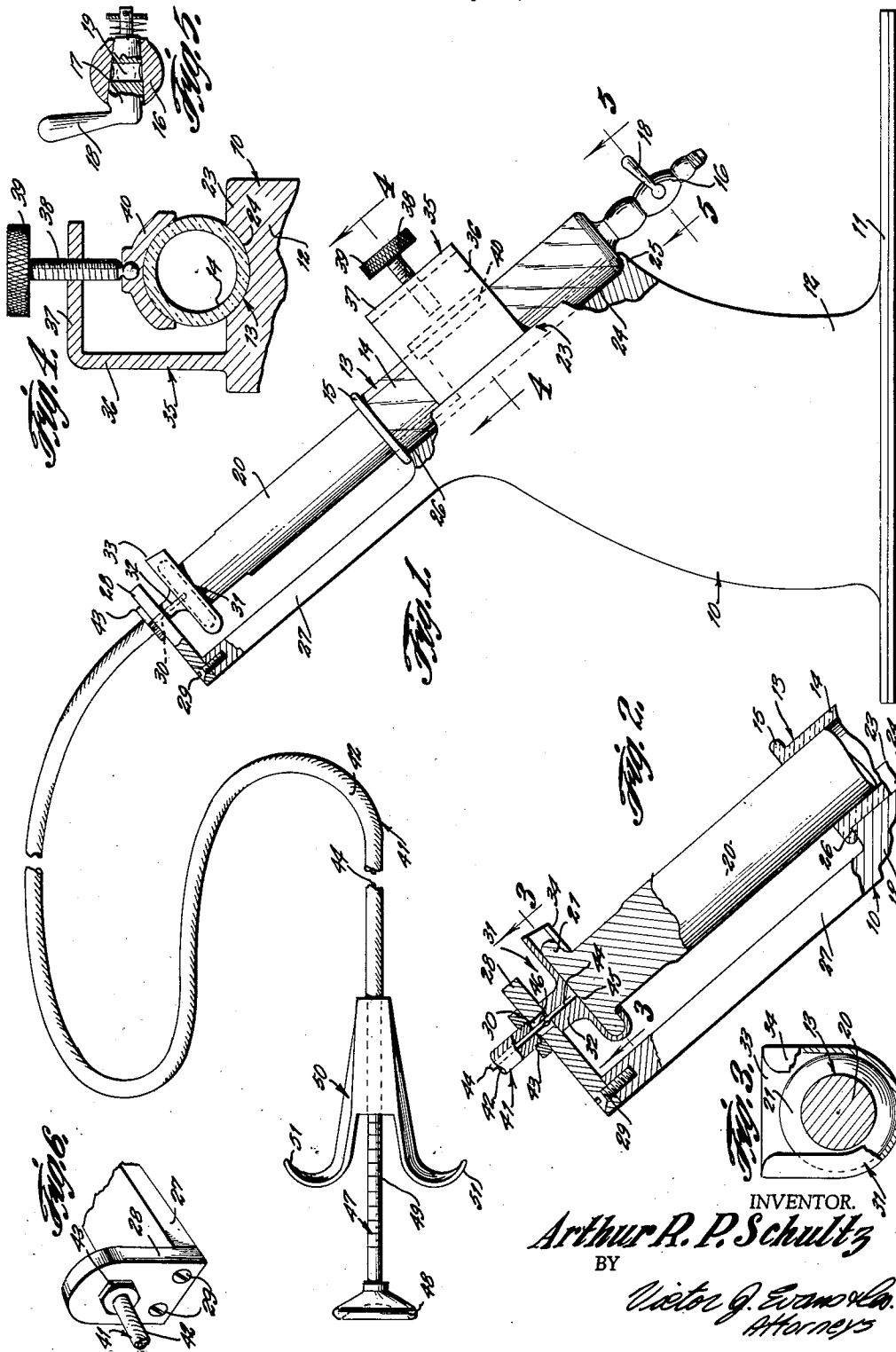
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SYRINGE HOLDER

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SYRINGE HOLDER

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4 Claims. (Cl. 128-215)

This invention relates to medical equipment, and more particularly to a syringe holder and actuator for such a syringe.

The primary object of this invention is to provide a means for conveniently supporting a syringe in a desired position such as an inclined position or location, and wherein according to the present invention a manually operable means is provided whereby the syringe can be actuated from a remote location.

A further object of the invention is to provide a syringe holder which permits the plunger of the syringe to be moved from a remote location so that medical personnel will be given protection as for example when equipment or substances are being used or handled that are of the type that give off harmful radiation, and wherein the present invention is especially suitable for use in supporting a Robb-Steinberg syringe.

Another object is to provide a device of the character described that may be utilized speedily and with precision by medical personnel or the like, and wherein the syringe holder of the present invention is economical to manufacture and efficient in operation and also rugged in structure and foolproof in use.

These and other objects of the invention will become apparent from a reading of the following specification and claims, together with the accompanying drawings, wherein like parts are referred to and indicated by like reference characters and wherein:

FIGURE 1 is an elevational view of the syringe holder of the present invention, with parts broken away and in section.

FIGURE 2 is a fragmentary sectional view on an enlarged scale showing certain constructional details of the present invention.

FIGURE 3 is a partial sectional view taken on the line 3-3 of FIGURE 2.

FIGURE 4 is a partial sectional view taken on the line 4-4 of FIGURE 1.

FIGURE 5 is a partial sectional view taken on the line 5-5 of FIGURE 1.

FIGURE 6 is a fragmentary perspective view showing the connection of the flexible cable to the end piece of the stand or support.

Referring in detail to the drawings, the numeral 10 indicates the holder or support of the present invention which is shown to comprise a horizontally disposed platform 11 that has an upstanding base 12 secured thereto or formed integral therewith, and the numeral 13 indicates a conventional syringe which is adapted to be supported in an inclined position by means of the present invention. The syringe 13 may be a Robb-Steinberg type of syringe, and the syringe 13 is shown to comprise a barrel 14 that has a circular enlargement 15 on one end thereof, and a fitting or tip 16 is arranged on the other end of the barrel 14, and as shown in FIGURE 5 the fitting 16 is provided with a stop cock 17 which can be manually moved by means of a handle 18, and the stop cock 17 is provided with the usual port or opening 19 therein. The syringe 13 further includes a sliding plunger 20 that is provided with an enlarged circular head 21 on the outer end thereof, FIGURE 2.

The numeral 23 indicates the upper portion of the base 12 which is inclined at an angle approximately fifty degrees with respect to the horizontal platform 11, for a purpose to be later described, and there is provided in

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the upper inclined portion 23 an elongated recess or groove 24 for snugly receiving therein a portion of the syringe barrel 14, and the shoulder 25 on the base 12 is engaged by an end of the barrel 14 in order to help maintain the barrel in its proper place in the recess 24. As shown in FIGURE 1 the enlargement 15 of the barrel 14 is adapted to engage a shoulder portion 26 on the base 12 so as to help prevent accidental shifting or movement of the syringe.

The numeral 27 indicates an upwardly inclined projecting arm or support member that is secured thereto or formed integral with the base 12, and as shown in FIGURE 1 an end piece 28 is arranged at right angles with respect to the support member 27, and the end piece 28 is secured to the support member 27 as for example by means of screws or securing elements 29. The support member 28 is provided with openings 30 therein, and the numeral 31 indicates a receiver that is arranged contiguous to the end piece 28. The receiver 31 includes a body portion 32 as well as a wall section 33 that has an integral flanged portion 34 for snugly receiving therein the head 21 of the plunger 20.

There is further provided a clamp which is indicated generally by the numeral 35, and the clamp 35 embodies a bracket that includes legs 36 and 37 that are arranged at right angles with respect to each other, FIGURE 4, and the clamp bracket 35 is secured to or formed integral with the portion 23 of the base 12. The numeral 38 indicates a screw member that is adjustably connected to the portion 37, and a knurled element 39 on the screw member 38 facilitates the manual adjustment thereof. The numeral 40 indicates an arcuate saddle or yoke that is connected to the lower end of the screw member 38, and the saddle 40 is adapted to engage the barrel 14 of the syringe 13.

The numeral 41 indicates a flexible cable that includes an outer sheathing 42 that is connected to a fastener 43, and the fastener 43 may be firmly affixed to the end piece 28. A flexible wire 44 is slidable in the outer sheathing 42, and the wire 44 may have an end thereof peened over or flattened as at 45, and also a portion of the wire 44 may be flattened as at 46. This construction, that is the provision of the enlarged or flattened portions 45 and 46 serves to insure that the receiver 31 will be firmly affixed to the sliding inner wire 44 of the flexible cable 41 so that as this wire 44 is moved, the receiver 31 will be moved in order to reciprocate or move the plunger 20 into or out of the barrel 14 of the syringe 13.

The numeral 47 indicates a manually operable actuator which includes a thumb piece 48 as well as a rod-like portion 49, and the rod-like portion 49 is provided with calibrations or indicia thereon, as for example as shown in FIGURE 1.

As shown in FIGURE 1, there is provided a hand gripping element 50 which is suitably affixed to the sheathing 42 of the flexible cable 41, and the hand gripping element 50 is provided with finger engaging lugs 51 thereon.

From the foregoing, it is apparent that there has been provided a syringe holder or support, and in use with the parts arranged as shown in the drawings, it will be seen that the stand or holder 10 is adapted to be arranged in a convenient location such as in a position adjacent to a patient being treated or examined in a hospital or the like, and the horizontally disposed platform 11 provides a firm support for the base 12 which extends upwardly from the platform 11, and the base 12 is provided with the inclined upper portion 23 that has the support member or arm 27 inclined upwardly therefrom. The end piece 28 is fastened as at 29 to the support member 27, and the syringe 13 is adapted to be arranged as shown in FIGURE 1 so that the barrel 14 of the syringe 13 is snugly received in the recess 24 of the base 12 and the

lower edge or end portion of the barrel 14 is adapted to abut or engage the stop shoulder 25 formed on the base 12. The enlargement 15 on the other end of the barrel 14 is adapted to engage the portion 26 of the base 12, and these parts together with the clamp means 35 insure that the syringe 13 will be properly held in position as it is actuated. The clamp 35 includes the member that consists of the right angularly arranged portions 36 and 37, and the screw members 38 extended through the portion 37 is arranged in threaded engagement therewith, so that by manually rotating the knob 39, the screw member 38 can be rotated or adjusted in order to move the arcuate saddle 40 into or out of clamping engagement with respect to the barrel 14 of the syringe 13. The syringe 13 includes the usual sliding plunger 20 as well as the tip 16 that is provided with the stop cock 17, and the stop cock 17 as shown in FIGURE 5 includes the opening or port 19 which can be moved into and out of opened or closed position as for example by manually moving the handle 18.

The head portion 21 of the plunger 20 is snugly received in the receiver 31, and it will be noted that the receiver 31 is shaped to include the wall section 33 as well as the flanged section 34 whereby the head portion 21 of the plunger 20 can be readily disengaged from the receiver or arranged in engagement with the receiver. The receiver 31 is firmly affixed to the sliding inner wire 44 of the flexible cable 41, and this is accomplished in any suitable manner, as for example by peening over portions of the wire 44 as indicated by the numerals 45 and 46 so that the receiver 31 will be securely affixed to the sliding wire 44. Thus, as the wire 44 is moved back and forth within the sheathing 42, the receiver 31 will be moved back and forth so as to cause the plunger 20 to be moved relative to the stationary barrel 14. This movement of the plunger 20 can be used for the usual purpose, that is for discharging the contents of the syringe 13 out through the tip 16 or the like.

The present invention includes a remotely operated means whereby the plunger 20 can be moved from a remote location so that it is not necessary for the user to manually grip the plunger 20 and move the same since this movement of the plunger can be accomplished from a considerable distance spaced away from the syringe. This remote operation can be brought about by manually gripping the element 50, and then manually moving or pushing on the finger piece 48 whereby with the rod-like element 49 secured to the inner sliding wire 44, it will be seen that this relative movement between the elements 48 and 50 will result in the wire 44 sliding in the outer sheathing 42, and since the wire 44 is secured to the receiver 31, it will be seen that this will cause corresponding movement of the receiver 31 so as to move the plunger 20. The portion 49 of the actuator 47 is adapted to be provided with indicia or scale markings thereon, as for example as shown in FIGURE 1 so that the person operating the syringe from a remote location can accurately observe or determine the exact quantity of material being dispensed or discharged from the syringe.

The parts can be made of any suitable material and in different shapes or sizes.

The primary purpose of the present invention is to protect medical personnel from the hazards of X-radiation during specialized examinations such as cerebroangiograms, angiocardiograms and all other types of venograms and arteriograms. With the present invention a neurosurgeon or the like will have a compact and uninvolved dependable and completely efficient manually operable injector which includes or incorporates the safety factor of distance as protection from a rapidly firing source of radiation.

The present invention includes the very simple base 12 for the attachment of a Robb-Steinberg syringe 13 which in turn is operated at the other end of a cable 41

which may be a steel cable seven feet long or the like, although the length of the cable can be varied as desired or required, and this cable 41 includes a flexible sheathing 42. The filled syringe 13 is adapted to be laid on the base and the head of the plunger is placed in the metal receiver 31 so that by twisting the thumb screw 38, the syringe will be stabilized.

The fifty degree angle of the syringe is believed to be optimum for either withdrawal or injection, and such an angle has been ascertained from experiments to be advantageous. The Robb-Steinberg syringe 13 may be a 50 cc. syringe and is generally of the same construction as any other 50 cc. syringe except that the tip 16 has a greater lumen (12G) to facilitate the rapid injection of a radio opaque contrast medium. Rapid injection in conjunction with rapid radiation exposures is necessary in order to properly visualize or rule out lesions in the circulatory system of the human body.

The simple construction and assembly of the present invention insures that the same can be produced economically, and its ease of storage and replacement of parts makes the same readily available to all hospitals and institutions. In addition, there is no explosion hazards and its sympathetic operation is as sensitive and efficient as the person operating the unit.

The device although herein described in connection with X-radiation examinations is easily adaptable to other forms of research, especially radioisotopes, and it can also be used either as a safety feature or where effective sensitiveness at a distance is required in other industries.

In addition, the flexible cable 41 which may be approximately seven feet long can be rolled up and tied to the base or detached for storage or replacement, as for example due to the provision of the screws 29 which permit separation of the parts. The element 49 is adapted to have the scale markings thereon which may be marked every $1\frac{1}{32}$ " of an inch apart so as to indicate 5 cc. of solution injected. The head 21 of the Robb-Steinberg syringe plunger 20 is adapted to be inserted in the receiver 31 as shown in the drawings. The syringe 13 is shown in FIGURE 1 arranged at an angle of fifty degrees. The design of the base 12 can be optional except for catheter clearance, and the unit should weigh at least fifteen pounds for stability.

The present invention is not restricted to any particular used in connection with the taking of pictures for medical case histories or the like as for example when a catheter is used, and wherein a dye may be injected under pressure. The stop cock 17 may be used in conjunction with angiocardiograms, and the syringe can be used for injecting various substances into veins in the patient's arms or the like.

It is to be understood, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

What is claimed is:

1. In a holder for a syringe of the type that includes a barrel provided with a circular enlargement on one end and a tip on the other end, a stop cock connected to said tip, a plunger slidably connected to said barrel and said plunger being provided with an enlarged circular head on the outer end thereof; said holder comprising a horizontally disposed platform, an upstanding base on said platform, the upper portion of said base being inclined at an angle of approximately fifty degrees with respect to said platform, the upper portion of said base being provided with an arcuate recess for snugly receiving therein a portion of said barrel, the enlargement on said barrel engaging an upper edge portion of said base, there being a shoulder adjacent the lower portion of the recess for engaging the lower portion of said barrel, an inclined upwardly projecting support member affixed to said base,

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an end piece arranged at right angles with respect to said support member and secured thereto, there being an opening in said end piece, a receiver including an apertured portion contiguous to the opening in said end piece, and said receiver further including a body portion provided with a ball section and a flanged section for receiving the head of the plunger; a clamp including a bracket affixed to the upper portion of said base, a screw member adjustably connected to said bracket, an arcuate saddle connected to said screw member for engaging the barrel of said syringe; a flexible cable including an outer sheathing affixed to said end piece, a wire slidably arranged in said sheathing, one end of said wire being extended through the opening in said end piece and being connected to said receiver, and manually operable actuating means connected to said cable.

2. In a holder for a syringe of the type that includes a barrel provided with a circular enlargement on one end and a tip on the other end, a stop cock connected to said tip, a plunger slidably connected to said barrel and said plunger being provided with an enlarged circular head on the outer end thereof; said holder comprising a horizontally disposed platform, an upstanding base on said platform, the upper portion of said base being inclined at an angle of approximately fifty degrees with respect to said platform, the upper portion of said base being provided with an arcuate recess for snugly receiving therein a portion of said barrel, the enlargement on said barrel engaging an upper edge portion of said base, therebeing a shoulder adjacent the lower portion of the recess for engaging the lower portion of said barrel, an inclined upwardly projecting support member affixed to said base, an end piece arranged at right angles with respect to said support member and secured thereto, there being an opening in said end piece, a receiver including an apertured portion contiguous to the opening in said end piece, and said receiver further including a body portion provided with a ball section and a flanged section for receiving the head of the plunger; a clamp including a bracket affixed to the upper portion of said base, a screw member adjustably connected to said bracket, an arcuate saddle connected to said screw member for engaging the barrel of said syringe; a flexible cable including an outer sheathing affixed to said end piece, a wire slidably arranged in said sheathing, one end of said wire being extended

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through the opening in said end piece and being connected to said receiver, and manually operable actuating means connected to said cable, said last named means comprising a finger gripping element affixed to said outer sheathing and provided with arcuate finger engaging lugs thereon, and a thumb piece having a rod like element affixed thereto and said rod like element being connected to the inner wire of said cable.

3. The structure as defined in claim 2 wherein said rod like element has indicia thereon providing scale markings.

4. A syringe holder comprising a horizontally disposed platform, an upstanding base on said platform, the upper portion of said base being inclined at an angle of approximately fifty degrees with respect to said platform, the upper portion of said base being provided with an arcuate recess therein, there being a shoulder adjacent the lower portion of said recess, an inclined upwardly projecting support member affixed to said base, an end piece arranged at right angles with respect to said support member and connected thereto, there being an opening in said end piece, a receiver including an apertured portion contiguous to the opening in said end piece, and said receiver further including a body portion provided with a wall section and a flanged section, a clamp including a bracket affixed to the upper portion of said base, a screw member adjustably connected to said bracket, an arcuate saddle connected to said screw member, a flexible cable including an outer sheathing affixed to said end piece, a wire movably arranged in said sheathing, one end of said wire being connected to said receiver, a thumb piece having a calibrated rod like element connected to the other end of said wire, and a finger engaging element connected to said sheathing for coaction with said thumb piece.

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