

Aug. 18, 1942.

J. R. VANDIVIER
EMBALMING APPARATUS

2,293,579

Filed Aug. 19, 1939

2 Sheets-Sheet 1

Fig. 1.

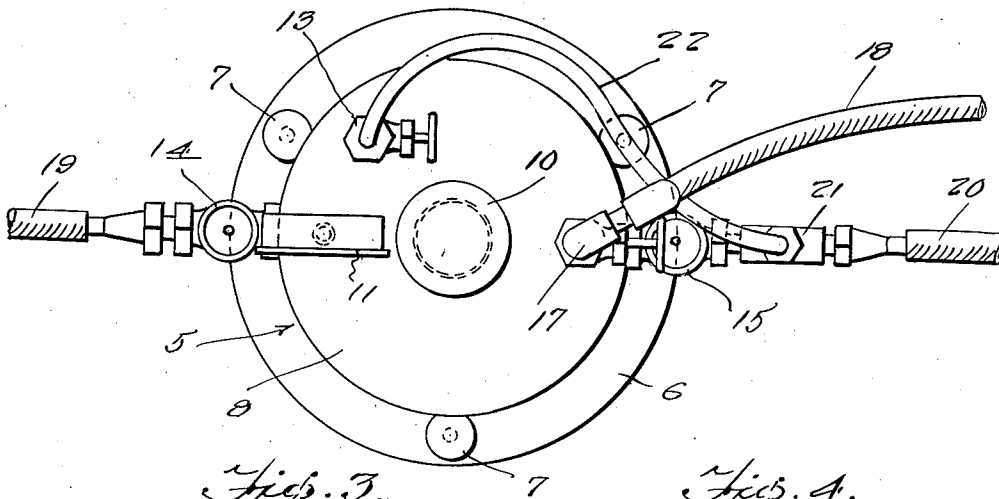


Fig. 3.

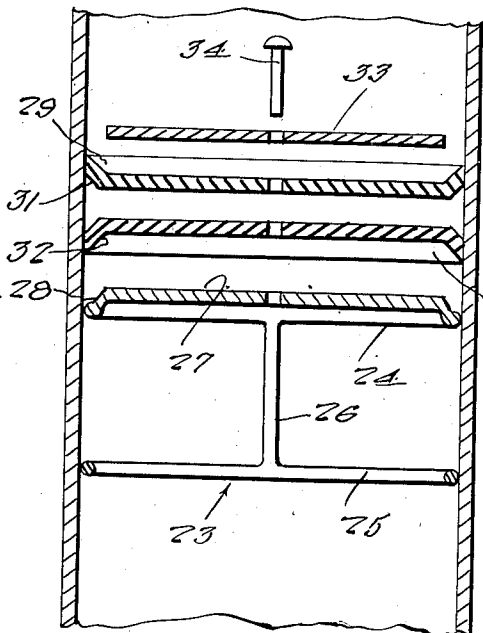
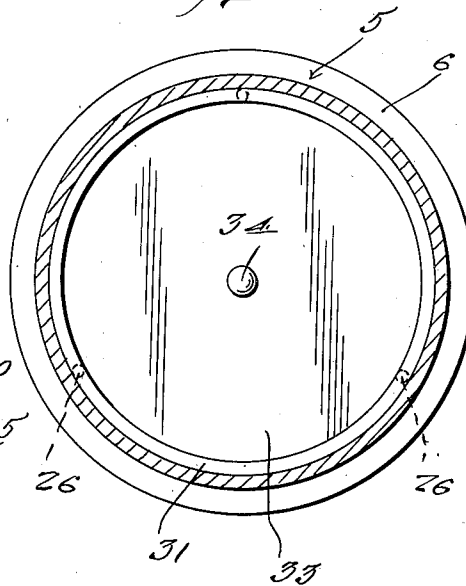


Fig. 4.



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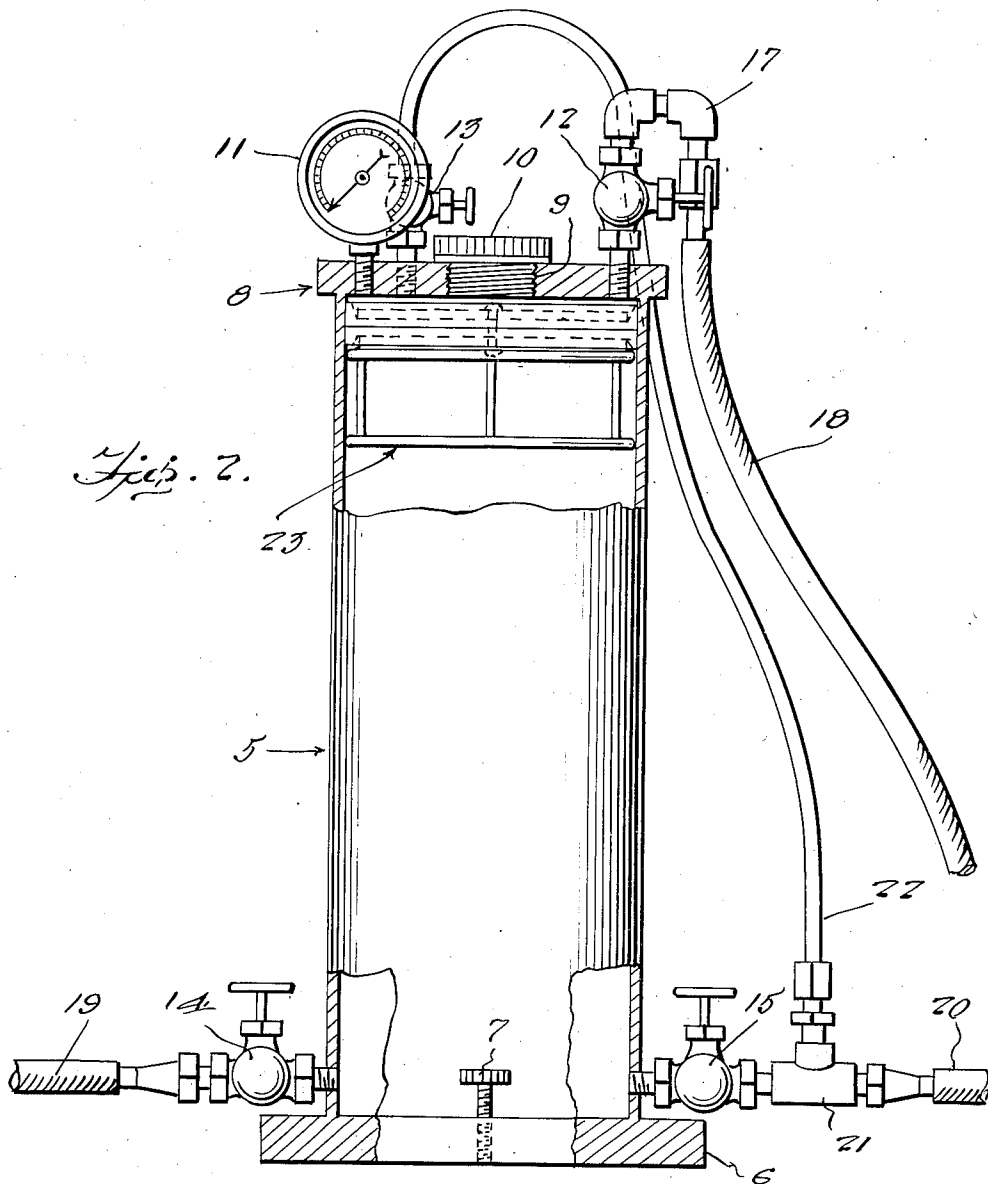
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UNITED STATES PATENT OFFICE

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EMBALMING APPARATUS

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Application August 19, 1939, Serial No. 291,099

2 Claims. (Cl. 221-67)

My invention relates to improvements in embalming apparatus and has particular reference to apparatus of this character for injecting the fluid at any desired constant pressure at a controlled rate of flow by hydraulically actuated means, and an important object of my invention is to provide arrangements of the character indicated which may be embodied in a device which is simple in construction, efficient in operation, and economical in use, without requiring skilled operation or supervision.

Other important objects and advantages of my invention will be apparent from a reading of the following description in connection with the drawings wherein a preferred embodiment of the invention is shown for illustrative purposes.

In the drawings:

Figure 1 is a general top plan view of the embodiment.

Figure 2 is a general side elevational view thereof, with portions broken away to show interior mechanism.

Figure 3 is an enlarged transverse vertical sectional view taken through the cylinder and showing the combined valve and piston in disassembled condition.

Figure 4 is a top plan view of Figure 3.

Referring in detail to the drawings, the numeral 5 generally designates a vertically elongated cylinder rising from a laterally extending base 6 which is adapted to rest upon a supporting surface (not shown) and to be properly levelled by means of leveling screws 7 threaded through the base. The upper end of the cylinder is closed by a top 8 which has an axial threaded filling opening 9 therein which is closed by a threaded plug 10. A pressure gauge 11 communicates with the interior of the cylinder through the said top 8 at one side thereof and in a diametrically opposite position one side of a flow control valve 12 has communication with the interior of the cylinder through the said top 8. In a circumferentially spaced position adjacent the pressure gauge 11 a by-pass valve 13 is mounted on the said top 8 and has communication with the interior of the cylinder 5.

At the lower end of the cylinder 5 a water exhaust control valve 14 has communication with the interior of the cylinder adjacent the base 6 and in a diametrically opposite position is the water inlet valve 15 which also has communication with the interior of the cylinder at approximately the same level as the valve 14.

A swivel coupling 17 is connected to the valve 12 and the coupling has extending therefrom the injector tube 18 which leads to the body to be embalmed. The valve 14 is connected to a drain hose 19 leading to a drain (not shown) while the valve 15 is connected to a water supply pipe 20 and interposed between the supply pipe 20 and

the valve 15 is a T-coupling 21 which has connected laterally thereto the reduced diameter by-pass pipe 22 which is connected with the by-pass valve 13. All of the various valves described have manual controls whereby the flow through the various valves may be accurately adjusted.

Vertically movable within the cylinder 5 and capable of falling therein from an elevated position to a depressed position by the force of gravity is the combined piston and valve which is generally designated 23 and comprises a cage comprising upper and lower rings 24 and 25, respectively, spaced and connected by a vertical bars arranged at substantially equally circumferentially spaced intervals.

Secured to the upper ring 24 is a substantially rigid metal disk 27 which is smaller in diameter than the ring 24 which has a comparatively close fit in the cylinder, the disk 27 having its circumferential edges beveled as indicated by the numeral 28. Above the metal disk 27 are two leather or similar material disks 29 and 30, respectively, which are similar but reversed in position, the angulated wall 31 of the upper disk being in an inclined position, with the wall 32 of the lower disk in a declined position and forcibly engaging the interior of the cylinder 5. Above the sealing disks 29 and 30 is the clamping disk 33 of suitably rigid material and which is of a diameter smaller than that of a sealing ring so as to engage the upper ring 29 only within the beveled wall 31. The area of the lower metal disk 27 within its beveled edges is approximately the same as the area of the upper clamping disk 33 so that the two disks 27 and 33 cooperate in clamping the sealing disks together on the valve cage in a manner to leave the beveled walls 31 and 32 of the sealing disks free to flex. A rivet or the like 34 is provided to pass through axial openings in the various disks to clamp the same on the valve cage 23 in the assembled relation illustrated in Figure 2 of the drawings.

To operate the present device the filling opening cover 10 is removed and the combined piston and valve 23 is placed at the lower end of the cylinder 5 and all of the space within the cylinder below the valve 23 is then entirely filled with water by opening the water inlet valve 15, thereby allowing the air above the combined piston and valve 23 to exhaust through opening 9. At this point when the combined piston and valve 23 reaches the top of the cylinder the inflow of water from inlet valve 15 will cease and said inlet valve 15 is manually closed. The water exhaust valve 14 is then opened to allow the water below the piston to discharge into the drain, thereby allowing the combined piston and valve 23 to settle by gravity toward the bottom of the cylinder 5. When the combined piston and valve 23 reaches the lower end of the cylinder the water

will cease flowing through valve 14 due to the valve occluding position reached by the piston 23. At this point valve 14 is manually closed. At this period in the operation the desired number of ounces of concentrated embalming fluid is poured through the opening 9 above the piston 23 and the water intake valve 15 is then opened to allow water from the water supply to enter the cylinder 5 below the disk 27 of the piston 23 and thereby cause the piston to rise in the cylinder and push the embalming fluid above it toward the top of the cylinder, thereby forcing out of the cylinder through the opening 9, any air which may be in the cylinder. When the embalming fluid has been pushed to a level even with the top of the cylinder the valve 15 is closed and the cover 10 then replaced and screwed down tight. The device is now ready for mixing the concentrated embalming fluid with water above the piston 23. To effect this the water exhaust valve 14 is opened to allow the water below the piston 23 to drain out and the by-pass valve 13 is opened to allow water under pressure from the supply to flow through the by-pass 22 into the cylinder above the valve 23 and mix with the concentrated embalming fluid therein and at the same time force the piston downwardly. When the piston 23 reaches the bottom of the cylinder, having forced out the water below it through the hose 19, the piston prevents the mixture of water and embalming fluid above it from exhausting through the valve 14 due to the valve occluding position reached by the piston 23. The stopping of the piston in the bottom position also prevents any more water from entering the space above the piston through the by-pass 22. The device is now ready to start injection of the diluted embalming fluid resident in the cylinder 5 above the piston 23 into the artery of the corpse via the pipe or hose 18. To accomplish injection both the water exhaust valve 14 and the by-pass valve 13 are closed and the injecting fluid flow control valve 12 is opened a predetermined amount to provide the desired rate of flow of the embalming fluid from the hose 18. The water inlet valve 15 is then opened to let the water under pressure from the supply to flow into the cylinder under the piston 23 until the pressure gauge 11 shows that a pressure has been developed within the cylinder and above the piston exactly equivalent to the injection pressure desired. This pressure is maintained until the embalming fluid above the piston 23 is exhausted by progressive upward movement under hydraulic pressure of the piston 23, and thereby injected into the corpse.

It will be obvious that the embalming pressure and the rate of injection of the embalming fluid is controlled by controlling the rate of flow at which the water from the water supply, such as the ordinary water main, is allowed to enter the cylinder 5 below the piston 23. When the piston 23 reaches the top of the cylinder it is stopped by engagement with the head 8 and is then in such a position that it occludes the valves 12 and 13 in the head of the cylinder, thereby preventing water from the supply from exhausting through the injecting valve 12. It is obvious that when the piston stops at the top of its rise and the water pressure under it in the cylinder equals the supply pressure, no more water enters the cylinder through the valve 15. Thus the piston acting as a stop valve allows only a predetermined

amount of water to enter the cylinder when it is filled and automatically stops the action of the device when the predetermined amount of embalming fluid above the piston in the cylinder has been injected into the corpse. It is obvious that the rate of movement upwardly of the piston is governed by the adjustment of the valve 15, supposing a constant water supply pressure. It will be obvious from a consideration of the foregoing that all air being exhausted from the cylinder as a result of the operation of the piston, no air or gas can develop in the device which would be injected into the corpse with the embalming fluid, thereby obviating an objectionable condition associated with other injecting apparatus.

Although I have shown and described herein a preferred embodiment of my invention, it is to be definitely understood that I do not desire to limit the application of my invention thereto, except as may be required by the scope of the subjoined claims.

Having described the invention, what is claimed as new is:

1. A device of the character described, said device comprising a cylinder, a piston working in said cylinder, said piston dividing said cylinder into a fluid containing chamber and a water pressure chamber, filling means for placing fluid in said fluid chamber, a valved discharge on the fluid chamber end of said cylinder, a valved water drain and a valved water pressure inlet in the sidewalls of the water pressure chamber end of said cylinder, said piston being arranged to move away from said water pressure chamber end of the cylinder with said valve water drain closed and said valve water pressure inlet open and connected to a source of water under pressure, said piston thereby compressing the fluid in said fluid containing chamber so as to force the fluid through said valved discharge with said valved discharge open and said filling means closed, the valves of said discharge means and water pressure inlet being adjustable to predetermine the rate of discharge of the fluid from said fluid containing chamber, a valved by-pass conduit connected between a point outwardly of the valve of said water pressure inlet and said fluid chamber for mixing water under pressure with fluid in said fluid chamber and to move said piston toward the water pressure chamber end of the cylinder.

2. An embalming apparatus comprising a cylinder, a piston in the cylinder dividing said cylinder into an embalming fluid containing chamber and a liquid pressure chamber, filling means for placing fluid in said fluid chamber, a valved discharge on the fluid chamber end of said cylinder, a valved liquid drain and a valved liquid pressure inlet in the liquid pressure chamber end of said cylinder, the piston being arranged to move away from said liquid pressure chamber end of the cylinder with said valved liquid drain closed and said valved liquid pressure inlet open and connected to a source of liquid under pressure, said piston thereby compressing the embalming fluid in said fluid containing chamber so as to force the fluid through said valved discharge with said valved discharge open and valve controlled means for forcing liquid into the fluid chamber to dilute the embalming fluid and force the piston toward the liquid chamber end of the cylinder.

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