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WATER SUPPLY INSTALLATION

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Fig. 2

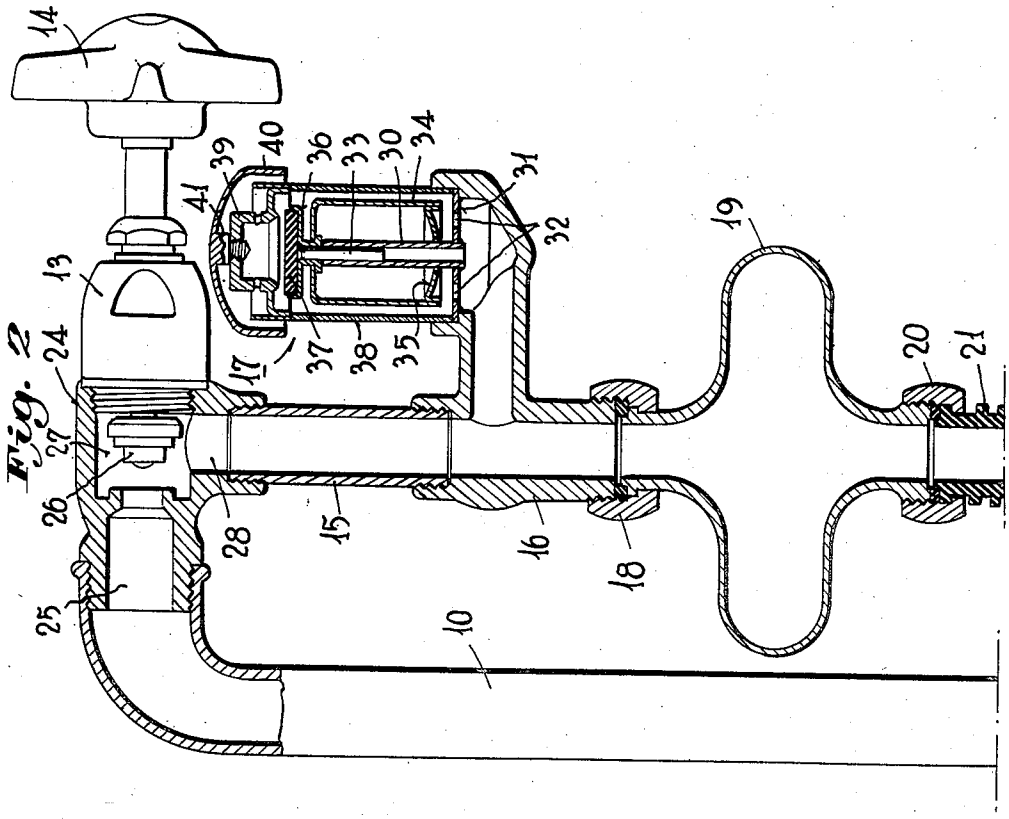
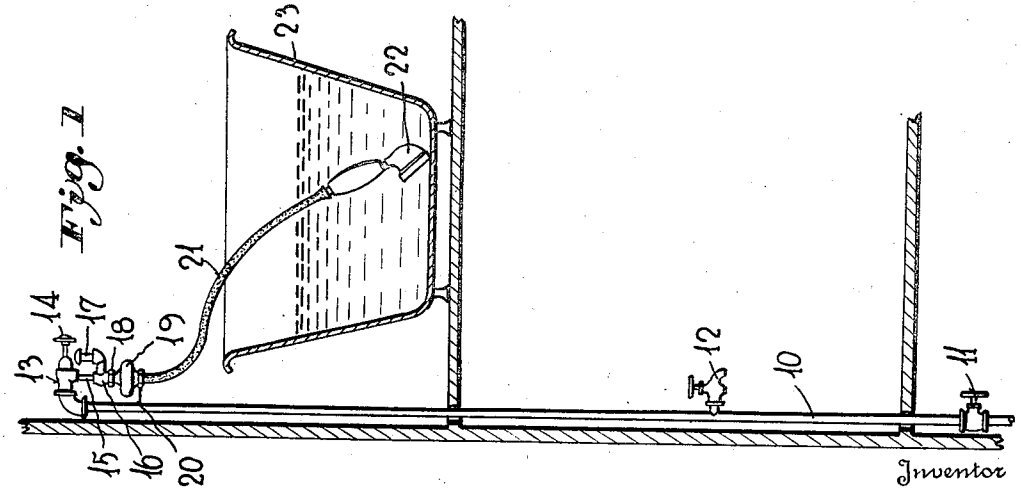


Fig. 1



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WATER SUPPLY INSTALLATION

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4 Claims. (Cl. 137—69)

This invention relates to water supply installations when water is supplied to a desired vessel such as a basin, bath tub, wash boiler or the like from a tank cistern or other source of supply by means of a flexible pipe such as a hose pipe, douche pipe or the like.

In such cases there is always a danger of the used or dirtied contents of the vessel being drawn back into the clean water supply pipe since the mouth of the flexible filling pipe can dip below the surface of the water in the vessel. For example if in such cases while the tap filling the vessel is open the supply of water to the vertical pipe of the system is shut off at a lower point in the pipe and at the same time a tap is turned on at an intermediate point then the vertical pipe will be emptied and a syphon effect will be set up drawing the used water out of the vessel back into the clean water pipe.

In order to prevent this it has been proposed to provide air inlet valves which, when a suction effect is set up, allow air to enter the pipes and stop the suction. With such an arrangement, however, the risk is incurred that when for example a flexible douche pipe which has been lying in the used water is lifted, the used water therein runs back inside the pipe and prevents the formation of a column of air. On this account it has further been proposed to raise the supply pipe to a point above the highest level attainable by the mouth of the flexible pipe and to locate the air inlet valve at that point. Such an arrangement, however, is difficult to install especially in low rooms and in addition to taking up a large amount of space it is expensive to produce. Another proposal was to replace a simple air-inlet valve by a so-called 'interrupter' in which a non-return valve shuts off the clean water pipe from the place of consumption directly any suction effect occurs in the upcast pipe. Such non-return valves, however, are very unreliable because they are continuously immersed in water and therefore become encrusted.

The object of the present invention is to provide improved means for preventing the return of used water to the clean water pipe in arrangements of the above kind.

According to the invention between the air-inlet valve and the pipe such as a flexible douche pipe leading to the vessel wherein the water is to be used a container is interposed the capacity of which is at least equal to that of the adjoining flexible douche pipe.

The result of providing such an intermediate container is that the used water which would run back when the flexible pipe filled with such water is raised can at the most only reach as far as the intermediate container which accommodates the whole of this water and therefore prevents the used water from passing beyond the point of attachment of the air-inlet valve and reaching a point at which a suction effect occurs in the clean water pipe which is in course of becoming empty.

To enable the invention to be fully understood it will now be described by reference to the accompanying drawing in which:

Fig. 1 shows a water-supply installation partly in section having one suitable arrangement according to the invention combined with a water tap, and

Fig. 2 shows a section drawn to a larger scale through the tap equipped with the arrangement of Fig. 1.

The water-supply installation shown in the drawing consists of a vertical pipe **10** with main stop-cock **11**, a draw-off tap **12** on a lower story and a water tap **13**, with handle **14**, on an upper story. By means of a short pipe **15** and T-piece **16** the tap **13** is fitted with an air-inlet valve **17**. Attached to said valve is an intermediate container **19** secured by a union nut **18**. Secured to the container **19** by means of a union nut **20** is a flexible douche pipe **21** with a hand rose **22**. **23** denotes a bathtub.

As shown in Fig. 2 water is admitted into a chamber **27** in the casing **24** of the tap **13** through a branch **25** by opening a valve **26** actuated by a handle **14**. The water passes through a branch **28**, short pipe **15** and T-piece **16** into the intermediate container **19** and through the flexible douche pipe **21** and rose **22** to the place of consumption. The air-inlet valve attached to the T-piece comprises a guide tube **30** with a plate **31** provided with bores **32**. Movably guided in the tube **30** is a spindle **33** carrying a bell float **34** provided with a bottom **35**. The float **34** carries a plate **36** with a packing ring **37**. The whole is housed in a casing **38** in which is secured a valve seating **39**. The cover consists of a cap **40** which is detachably connected to the valve seating **39** by means for example of a screw **41** fixed to the inner side of the cap **40**. The cap **40** is of such dimensions as to leave a gap between itself and the casing **38**.

The arrangement operates in the following manner:

If, when the valve **26** through which the supply of clean water is admitted is open, the supply of clean water in the vertical pipe **10** is shut off by

the main cock 11 and at the same time the tap 12 is turned on, a syphon effect is set up by means of which used water in the tub might be drawn back into the clean water pipe 10 through the flexible douche pipe 21 and rose 22 in the event of the latter being left in the tub. This return suction, however, is prevented by the air-inlet valve 17 through which air is drawn into the vertical pipe 10 by negative pressure in the latter. In such case the air is drawn in through the gap between the cap 40 and the casing 38 and passes through the open valve 39, 37 into the space between the float 34 and casing 38 from thence through the bores 32 in the disc 31 of the T-piece 16 into the pipe connecting the vertical pipe with the place of consumption. The resulting column of air prevents the passage of used water from the tub into the water pipe. If the pipe 21 full of used water is now lifted up the whole of the backward flow of water will be accommodated by the intermediate container 19. In this manner the used water is prevented from passing above the point of attachment of the air-inlet device 17 into portions of the piping in which a suction effect can be set up during the emptying of the vertical pipe. Hence the used water cannot be drawn back into the clean water pipe even when the flexible pipe is lifted.

If on the other hand the main cock 11 is opened the pressure in the vertical pipe 10, when the tap 13 is open, causes the float 34 to rise carrying with it the plate 36 and packing ring 37 and pressing them against the valve seating 39 so that the water is prevented from escaping through the valve 17. The oncoming flow of water forces the dirty water out of the flexible pipe 21 and rose 22 back into the tap and clean water then runs into the tub 23.

I claim:

1. In a water supply installation wherein water is supplied to a desired vessel by means of a flexible pipe and wherein an air-inlet valve is provided between the flexible pipe and the supply pipe for the purpose of preventing used water from being drawn back into the installation, the provision between the point of attachment of the air-inlet valve and the point of attachment of the flexible pipe of a container having a capacity at least equal to that of the contents of the adjoining flexible pipe for the purpose described.

2. In a water supply installation according to claim 1 an arrangement wherein the air-inlet valve and the container are combined with a water supply tap.

3. In a water supply installation according to claim 1 an arrangement including a main cock wherein the air inlet valve is fitted with a float which rises and prevents water from escaping through the valve when the main cock of the installation is opened.

4. In a water supply installation wherein water is supplied to a desired vessel by means of a substantially vertically extending supply pipe having an outlet conduit which is adapted to extend down into water contained in said vessel and wherein an air-inlet is provided for the purpose of preventing water from being drawn back into the installation from said vessel, a container having a capacity at least equal to that of the adjoining outlet conduit connected to said installation between the air-inlet and the point of attachment of said outlet conduit.

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