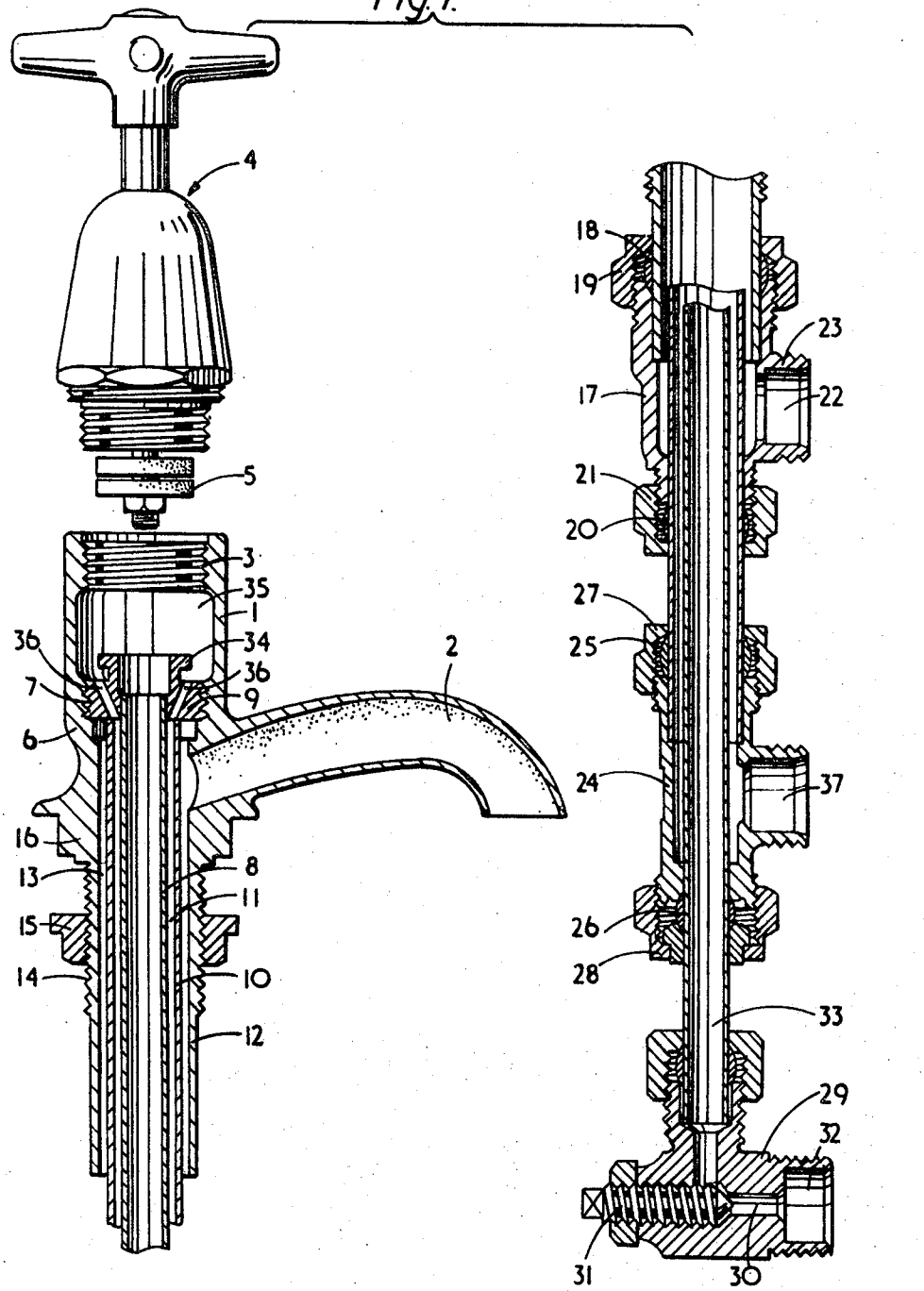
Sept. 30, 1969 A. F. WIGLEY 3,469,598

TAPS

Filed May 10, 1966 3 Sheets-Sheet 1

Fig. 1.



Inventor,
Albert Fletcher Wigley
By Lucke & Lucke

Sept. 30, 1969 A. F. WIGLEY 3,469,598

TAPS

Filed May 10, 1966 3 Sheets-Sheet 2

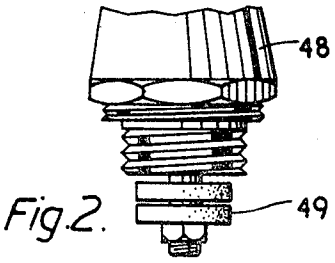


Fig.2.

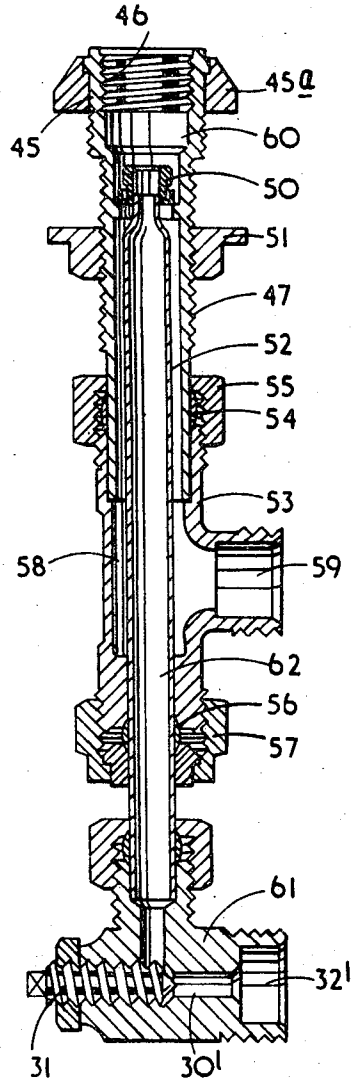
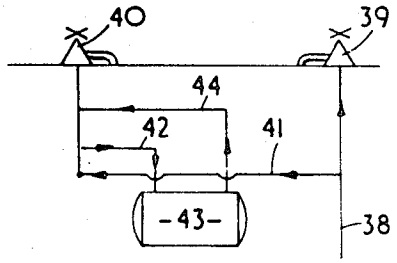


Fig.3.



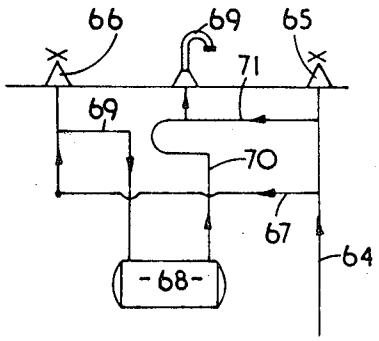


Fig.4.

Inventor
Albert Fletcher Wigley
By Lucke & Lucke

Sept. 30, 1969 A. F. WIGLEY 3,469,598

TAPS

Filed May 10, 1966 3 Sheets-Sheet 3

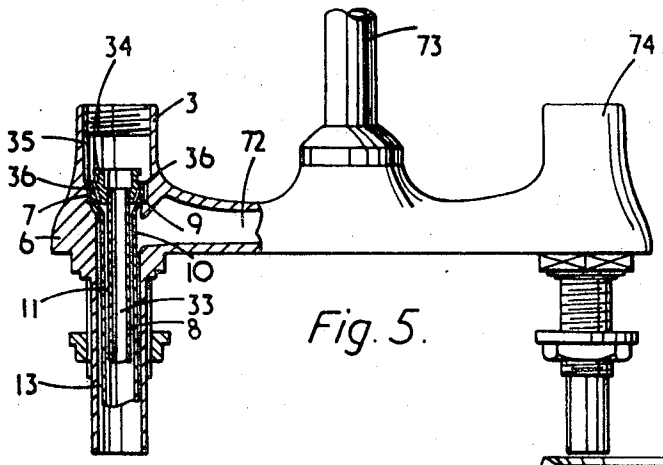


Fig. 5.

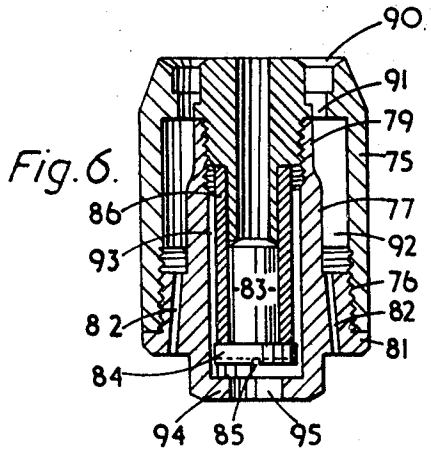


Fig. 6.

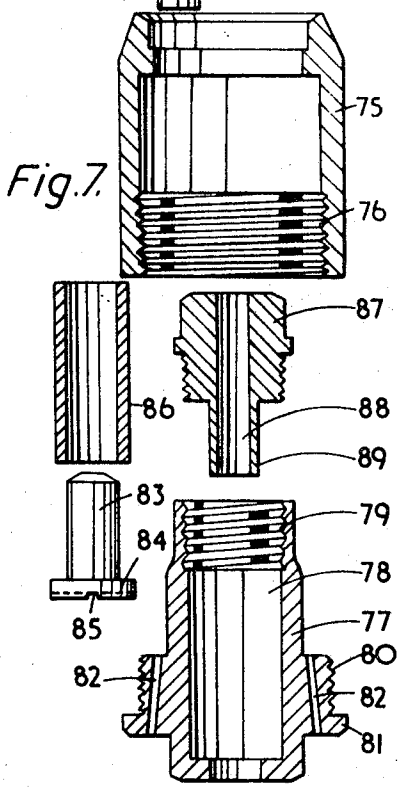


Fig. 7.

Inventor
Albert Fletcher Wigley
By Lucke & Lucke

United States Patent Office 3,469,598
Patented Sept. 30, 1969

3,469,598

TAPS

Albert Fletcher Wigley, Middleton Lodge, Lower Middleton St., Ilkeston, England

Filed May 10, 1966, Ser. No. 548,915
Claims priority, application Great Britain, May 11, 1965, 19,750/65
Int. Cl. E03c 1/044
U.S. Cl. 137—334 2 Claims

ABSTRACT OF THE DISCLOSURE

A control valve for a domestic water supply system including a cold water inlet, an outlet leading to a thermal storage heater, an inlet for the supply of hot water from the heater and a discharge outlet, with a valve closure member for controlling the water flow.

This invention relates to control valves and is more particularly concerned with control valves of the kind which include means controlling the flow of liquid to a thermal storage tank from which the heated liquid flows to a discharge outlet.

It is an object of the present invention to provide a new or improved form of such a control valve which is hereinafter referred to as a control valve of the kind specified. It is to be understood that the term "control valve" as used in this specification includes a tap.

It is a further object of the invention to provide a control valve which can be used separate from a discharge outlet. It is also an object of the invention to provide a control valve which includes a discharge outlet to which water is fed from the storage tank so that the control valve functions as a tap.

It is also an object of the invention to provide a new or improved form of spray attachment for use with a control valve and the spray attachment is particularly designed to ensure that, when expansion water flows from the storage tank through the outlet of a tap in which the attachment is fitted, the flow of water should not be prevented thereby avoiding the buildup of pressure within the pipe work leading from the storage tank.

The invention will now be described by way of example with reference to the accompanying drawings in which:

FIGURE 1 is a vertical view, mainly in section, of a tap,

FIGURE 2 is a corresponding sectional view of an alternative form of control valve,

FIGURE 3 is a schematic diagram showing a system including the tap shown in FIGURE 1,

FIGURE 4 is a schematic diagram showing a system including a valve as shown in FIGURE 2,

FIGURE 5 is a part sectional view of a "deck pattern" tap,

FIGURE 6 is a sectional view of a spray attachment, and

FIGURE 7 is an exploded view, again in section, of the various parts of the spray attachment.

As shown in FIGURE 1 the main body of the tap **1** is provided with a discharge outlet **2** of known form for the discharge of water into a sink or wash basin or the like. The tap body **1** is of hollow construction and is internally screw-threaded at **3** to receive a manually adjustable valve head on which a sealing member **5** is mounted. A hollow tube **8** is fitted into the neck **6** of the body **1**, the neck **6** being internally screw-threaded at **7** and the tube **8** is secured at its upper end to a nut **9** which is externally screw-threaded for cooperation with

the internal screw-thread **7** of the body **1**; the tube **8** constitutes an inlet pipe of the tap.

A second hollow tube **10** is mounted around the first tube **8** and is shorter than tube **8**. There is defined an annular space **11** between the two tubes **8** and **10**. An extension **12** of the body forms a housing between which and the tube **10** is defined a second annular space **13**. The extension **12** is open to the outlet **2** at its upper end and is also open at its lower end. The extension **12** has an externally screw-threaded portion **14** on which a nut **15** is fitted. The sink unit or like to which the tap is to be secured includes a flange which is located between the nut **15** and a shoulder **16** on the body **1**.

A junction piece **17** is fitted over the lower end of the extension **12** and is secured thereto by a compression fitting **18** and a screw-threaded washer **19** which is located on the outside of the junction piece **17** and has screw-threaded engagement therewith. The lower part of the junction piece **17** is sealed against the second pipe or tube **10** by means of a second compression fitting **20** and a washer **21** which again has screw-threaded engagement with the junction piece **17**. Between the two compression fittings **18** and **20** the junction piece **17** is formed with a port **22** constituted by the bore of a projection **23** of the junction piece **17**. The extension **23** is externally screw-threaded whereby it may be connected to a pipe leading from the outlet of a liquid, e.g. water heater.

The chamber **13** disposed between the outer surface of the second pipe **10** and the housing afforded by the extension **12** interconnects the outlet **2** and the port **22**. The chamber **13** is closed at its lower end by means of the junction piece **17**.

A similar junction piece **24** is secured to the pipe **10** at the lower end thereof by means of a compression fitting **25** and a washer **27** which is screw-threaded internally for cooperation with external screw-threads on the junction piece **24**. The junction piece **24** is connected by means of a compression fitting **26** and a screw-threaded washer **28** to the pipe **8**. In this way the chamber **11** between the two pipes **8** and **10** is closed at its lower end.

A jointing member **29** is secured to the lower part of the pipe **8** and has a bore **30** extending therethrough. A restricting screw **31** is provided in the bore **30** of the jointing member **29** to control the rate of flow of water through the inlet **32** into the bore **33** of the pipe **8**.

When water flows from the mains supply through the inlet **32** it passes up the central bore **33** of the pipe **8** to a valve seat **34** disposed at the upper end of the pipe **8** and constituted by part of the nut **9**. The sealing member **5** is then lifted by rotation of the operating member so as to allow water to flow from the pipe **8** into a valve chamber **35**. The nut **9** is formed with a series of ducts **36** whereby the water can flow from the chamber **35**, through the ducts **36**, into the chamber **11** between the two tubes **8** and **10** and hence to a port **37** constituted by an extention of the junction piece **24**. The port **37** is connected to the inlet of a water heater and heated water flows from the heater to the tap through the port **22**. From the port **22** the water flows into the chamber between the outer tube **10** and the extension **12** and thence to the discharge outlet **12** of the tap. Expansion water from the heater also passes through chamber **13** to the outlet **2**.

In FIGURE 3 there is shown a hot water system which includes a tap as shown in FIGURE 1. Cold water from the mains supply flows along a feed line **38** and passes to a cold tap **39** and to a hot tap **40** via a line **41**. The cold water flows past the restrictor **31** at the lower end of the tap and passes upwards through the central bore of the tap to the valve mechanism at the upper end of the bore. The water then flows from the tap through a feed line **42** to a heater **43** and heated water flows along line **44** into the tap **40** and then into the sink or wash basin.

The form of control valve shown in FIGURE 2 is intended to be used when the discharge outlet leading to the sink or wash basin is either remote from the valve or is common with that of a similar valve. The valve body **45** includes an internally screw-threaded portion **46** and an externally screw-threaded portion **47**. A manually operable member is contained within a head **48** and a sealing member **49** is movable by means of the operating member within a chamber **60** within the valve body **45**. The sealing member **59** is arranged to seal against a valve seat **50** and a screw-threaded washer **51** is threaded onto the externally screw-threaded portion **47** of the body **45** for securing the control valve to the flange of a sink unit or wash basin. A collar **45***a* supporting the valve from the wash basin or sink unit is disposed about the valve body **45** and is freely movable relative thereto. The collar **45***a* may be made either of metal or of a synthetic plastics material. The body **45** may alternatively be provided with an integral collar portion.

A hollow pipe **52** passes through the hollow body **45** and is secured at its upper end to a nut which is externally screw-threaded and which affords the valve seat **50**.

A junction piece **53** is fitted around the lower part of the pipe **52** and is clamped against the lower end of the valve body **45** by means of a compression fitting **54** and a screw-threaded washer **55**, said washer **55** including an internally threaded portion which cooperates with an externally threaded portion of the junction piece **53**. The junction piece **53** is also clamped to the tube or pipe **52** by a further compression fitting **56** and a screw-threaded washer or equivalent member **57** which is internally threaded for co-operation with the lower end of the junction piece **53** which is externally screw-threaded. An annular space **58** is defined between the pipe **52** on the one part and the housing afforded by the body **45** and the junction piece, **53** on the other part and this annular space **58** is arranged to be connected by means of a port **59** to a thermal storage heater or to a discharge pipe.

The jointing member **61** is secured to the base of the pipe defined by a further compression joint, the jointing member **61** being identical with that shown as **29** in FIGURE 1 and including a restricting screw **31** for controlling the rate of flow of water into the pipe **52**. With this control valve water flows through the inlet **52**, the bore **30** of the jointing member **61** and the bore **62** of the pipe **52** to the valve chamber **60**. The sealing member **49** is moved out of engagement with the valve seat **50** allowing water to flow into the chamber **60** and, from the chamber **60**, through ducts **63** in the nut constituting the valve seat and thence to the annular space **58** between the pipe **52** and the body **45** and junction piece **53** to the outlet port **59** and thence to the water heater or discharge pipe.

A system into which the control valve shown in FIGURE 2 may be fitted is illustrated in FIGURE 4. The mains supply is introduced through a feed line **64** to a cold valve **65** and a hot valve **66**. The water to the hot valve **66** flows through a feed line **67**. From valve **66** the water is fed, on moving the closure member **49** out of engagement with the valve seat **50**, to the water heater **68** via feed line **69**. From the heater **68** the hot water flows to the central outlet **69** of the system through the line **70**. The outlet line **71** from the cold valve **65** is connected to the line **70** between the heater **68** and the outlet **69**. In this way the volume and temperature of the water issuing through the outlet **69** is controlled by means of the two valves **65** and **66**.

In both the tap shown in FIGURE 1 and valve shown in FIGURE 2 assembly and dismantling thereof is facilitated by the use of the junction pieces **17**, **24** and **53** which are connected to the extension **12**, the pipe **10** and the body **45** respectively to close the ends of said parts. By arranging for screw-threaded connections of the junction pieces to their associated members, rapid connections and disconnections can be effected.

In FIGURE 5 there is shown a "deck pattern" fitting

in which the hot tap, shown on the left hand side of FIGURE 5, is similar to that shown in FIGURE 1. By a "deck pattern" fitting is meant one which is adapted to seat directly on the flange or rim of a wash basin or sink.

The tap has an outlet **72** which connects the tap to the discharge outlet **73** of the fitting. The outlet **73** is also connected tot he cold tap **74** of the fitting. The outlet **73** may include a swivellable spout and the form of the outlet **73** may be as of any conventional forms at present in use.

Identical parts of the hot tap shown in FIGURE 5 to those of the tap shown in FIGURE 1 are indicated by like reference numerals. Water enters the tap through the central bore **33** of the inlet pipe **8** and passes into the chamber **35** upon movement of the closure member **5** out of engagement with the valve seat **34**. The water then flows from valve **35** through the ducts **36** into the annular space **11** between the two pipes **8** and **10**. The water flows from space **11** to a water heater as described above with reference to FIGURE 1 and then reenters the tap, flowing into the annular space **13** between the pipe **10** and the housing of the tap, from said space **13** the hot water flows to the outlet **72** of the tap and then to the outlet **73** of the fitting.

In FIGURES 6 and 7 there is shown a spray attachment which is particularly suitable for installation in the discharge outlet of the tap as shown in FIGURE 1. The spray attachment includes an outer casing **75** which has an internally screw threaded portion **76**. The outer casing **75** is arranged to receive a hollow body **77** which has a cylindrical throughbore **78** which, at its outer end is formed with a restriction and, at its inlet end, is internally threaded at **79**. The body **77** includes an increased diameter portion **80** which is externally threaded and which terminates in an annular flange **81**. The annular flange **81** and the enlarged portion **80** are formed with a series of generally axial ducts **82** which terminate in nozzles in the outer face of the flange **81**. The thread of portion **80** of the body **77** cooperates with the thread **76** of the casing **75** whereby the body **77** may be secured in the casing to define an annular chamber **92** between the body and the casing.

An externally screw-threaded annular member **87** has a throughbore **88** and is arranged to have threaded engagement with the portion **79** of the body **77** whereby the member **87** is secured to the body **77**. The member **87** includes a generally cylindrical body portion having a flange arranged to abut the end face of the body **77** and the member **87** has an extension **89** which is of reduced diameter and which extends towards the outlet end of the body **77**.

A closure plug **83** having a head **84** with radial grooves **85** formed therein is pressed into a tube **86** of rubber or other elastomeric material which seals tightly around the plug **83**. The rubber tube **86** is provided with small cut away portions at the end thereof adjacent the head **84** to enable the flow of water between the end face of the tube **86** and the inner face of the head **84** of the plug **83**. The rubber tube **86** is arranged to fit tightly around the extension **89** of the member **87** so that the inner end of the plug **83** closes the bore **88** of the member **87**.

The assembled spray attachment is shown in FIGURE 6 and the parts thereof are shown in FIGURE 7. The assembled attachment is fitted into an outlet at **90** and water enters the attachment through an annular port **91** into the chamber **92** defined by the body **77** and the casing **75**. The water then passes from the chamber **92** through the ducts **82**. If the ducts should become blocked the water pressure in the bore **88** of the member **87** is such as to cause the rubber tube **86** to expand axially whereby the plug **83** is moved out of engagement with the end of the extension **89** of the member **87**. Water can then flow through the bore **88** and between the plug **83** and the rubber tube **86** and through the cut aways in the

tube into an annular space **93** between the tube **96** and the body **77**. As radial grooves are formed in the head **84** water in the space **93** can flow through said radial groove **85** and thence through the outlet port **95** which is bounded by an inwardly directed lip **94**.

The spray attachment thus enables expansion water to flow from the heater and discharge through the port **95** if the ducts **82** are blocked. The expansion of the elastomeric tube **86** under slight pressure prevents the build up of pressure within the heater.

What I then claim is:

1. A control valve which includes a housing having a vertically extending hollow bore, an inlet pipe in the hollow bore arranged coaxial with said bore, a second pipe coaxial with and on the outside of the inlet pipe to provide a first annular chamber between said second pipe and the housing and a second annular chamber between the inlet pipe and the second pipe, valve means at the upper end of said inlet pipe for controlling the flow of liquid from the inlet pipe into said second annular chamber, an outlet leading from said second annular chamber for the flow of liquid to a thermal storage tank, an inlet

communicating with the first annular chamber for receiving heated liquid from the storage tank and a discharge outlet for the discharge of the heated liquid from said first annular chamber.

2. A control valve according to claim **1** which includes a pair of junction pieces each for attachment to the second pipe, one of said junction pieces also being connected to the housing and the other of said junction pieces also being connected to the inlet pipe.

References Cited

UNITED STATES PATENTS

1,825,443	9/1931	Chormann et al.	137—334 XR
1,987,883	1/1935	White et al.	137—334
2,584,436	2/1952	Donaldson	137—610 XR
2,986,155	5/1961	Doyle	137—218
3,194,258	7/1965	Grant	137—218 XR
3,242,940	3/1966	Sirotck	137—218

SAMUEL SCOTT, Primary Examiner