

May 27, 1952

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2,598,148

DIVERTER VALVE

Filed July 28, 1948

FIG. 1

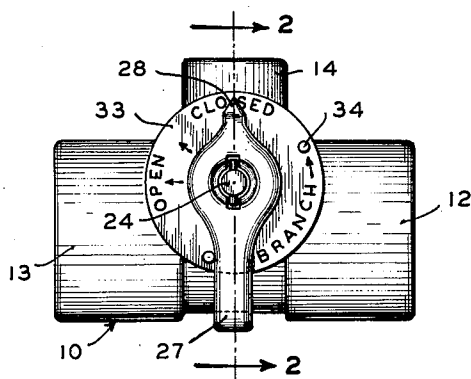


FIG. 2

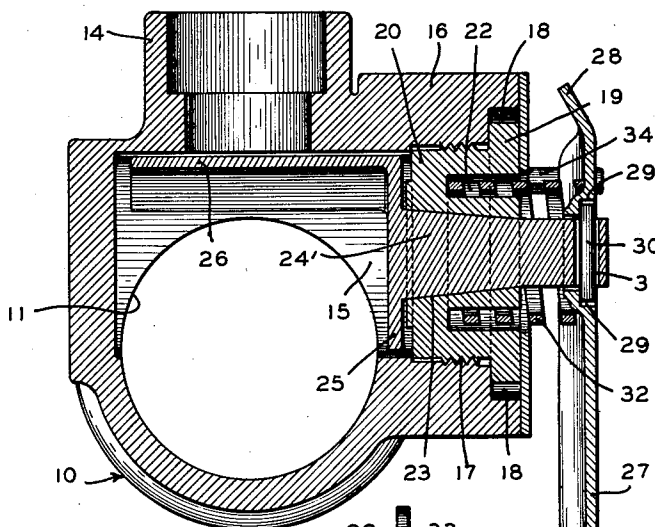
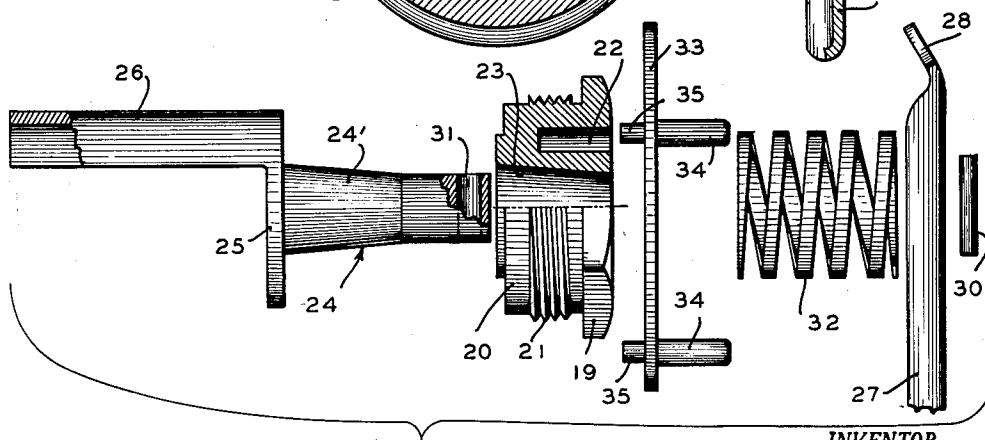


FIG. 3

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2,598,148

DIVERTER VALVE

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Application July 28, 1948, Serial No. 41,157

2 Claims. (Cl. 251-112)

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This invention relates to heat exchange systems of the character employing a fluid as a heat transmitting agent or vehicle. The invention is particularly applicable to a heat exchange system in which it is desired to selectively direct the heating medium into a heat exchanger and to control the amount of fluid so directed.

The invention is specifically directed to an adjustable supply T located in a line through which the heat transmitting vehicle or fluid passes to the portion of the system where the temperature is desired to be controlled, and is a modification of Patent No. 2,404,996 of August 1, 1946.

Heretofore in heat exchange systems in which the heat exchange medium is diverted from a supply line to individual units as in the above mentioned patent, the valve by means of which the heat exchange medium is directed into the heat exchange unit contained gaskets or other sealing elements. Frequently these have been unsatisfactory and subject to criticism from viewpoints of efficiency and durability. The questions of expense of manufacture, simplicity of assembly, installation and operation, and other similar factors are likewise important.

It is an object of the invention to provide an improved adjustable supply T for use between the supply line of a heat exchange system and each branch or unit thereof by means of which the direction of flow of heating fluid may be simply and accurately controlled or completely shut off without possibility of leakage or necessity of replacing any parts for an indefinite period.

A further object of the invention is to provide an adjustable supply T of simple and inexpensive construction requiring no special skill or equipment to install, can be readily taken apart or assembled, and is susceptible of simple and convenient adjustment by the general public.

A further object of the invention is to provide a bronze adjustable supply T, the main body of which is an inexpensive casting on which few machine operations are required, with the connection between the operating handle and the valve yieldably mounted in contact under sufficient tension to prevent leakage but permitting the necessary rotative adjustment thereof.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a front elevation of a device constructed in accordance with the present invention;

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Fig. 2, a vertical transverse section on the line 2-2 of Fig. 1; and,

Fig. 3, an exploded view of the several parts of the valve exclusive of its housing.

With continued reference to the drawings, the adjustable supply T of the present invention comprises a valve body 10 of bronze or other desirable material, cast or otherwise produced. The body or housing is provided with a horizontal passage or bore 11 adapted to form part of the supply line of a heat exchange system and having inlet and outlet connections 12 and 13 respectively. As stated, the body is of bronze or the like and is adapted to be used with copper or pipes of a similar character, not shown. The housing 10 is further provided with a vertical branch or connection 14 disposed at right angles to the supply line and through which the heating medium may be diverted into a suitable heat exchanger, not shown.

The housing or T is also provided with a transversely disposed cylindrical bore which intersects the longitudinal horizontal bore at substantially right angles thereto and forms a valve chamber 15 communicating with both the bore 11 and the branch connection or passage 14. An enlarged annular portion 16 is provided, surrounding the entrance to the valve chamber 15, internally screw threaded as at 17 and having an annular recess 18 for the reception of the hexagonal head 19 of a closure plug 20 which is externally screw threaded as at 21 for engagement within the threaded portion 17 of the entrance to the valve chamber. The recess 18 is of greater diameter than the threaded portion 17 and, as will be apparent from an examination of Fig. 2 of the drawing, the inner wall of said recess acts as a stop to limit the inward movement of the closure plug.

The closure plug 20 is provided on the outer face thereof with an annular groove or recess 22 and further with a centrally located conical tapered passage or bore 23 adapted for the reception of the complementarily tapered shank or stem 24 of a valve member 24. A disc-like portion 25 is integrally formed upon the valve stem and carries thereon an arcuate deflector valve 26 of sufficient width to close the entrance to the branch passage 14, when the valve is in the position illustrated in Fig. 2.

An operating handle or lever 27 is mounted upon the outer extremity of the valve stem 24, in any desired manner. Preferably this lever, which terminates in a pointed indicating finger 28, is provided with an aperture through which

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the valve stem passes, there being diametrically opposed recesses 29 on the periphery of this aperture for the reception of the extremities of a locking pin or the like 30 designed to pass through a suitable aperture 31 provided in the valve stem adjacent the outer extremity thereof.

Any suitable means may be employed to insure the snug engagement of the valve stem within the tapered bore of the closure plug. A preferred embodiment thereof comprises a coil spring 32 adapted to fit within the recess 22 provided in the outer face of the closure plug and adapted to bear against the inner surface of the operating lever, forcing said lever against the extremities of the pin 30. This spring is of sufficient length and tension that the compression thereof, occasioned by the assembly of the valve stem and lever and the installation of the locking pin, will insure adequate frictional engagement between valve and plug.

An indicating dial 33 is provided, marked with appropriate legends to visually indicate the condition of the valve with respect to the branch passage 14. Preferably stop pins 34 are mounted upon this dial to limit the rotative movement of the lever 27. If desired, the pins 34 may extend through the dial 33, terminating in reduced portions 35 adapted to be seated within properly aligned apertures (not shown) provided in the outer face of the annular portion 16 of the valve housing. Such an arrangement insures proper alignment of indicating dial, housing and valve.

One form of indicating dial has been disclosed showing the indicia "Branch," "Open," and "Closed." It will be apparent to those skilled in this art that proper installation places the lower extremity of the operating lever 27 between the stop pins 34, where the word "Branch" appears. With the lever in extreme vertical position the indicator points to "Closed" and the arcuate deflector valve 26 is so positioned as to prevent ingress of heating fluid into the branch passage 14. With the lever then rotated counterclockwise to substantially horizontal position, the finger 28 will indicate "Open," there being an intermediate arrow showing a partially open position. In open position a portion of the arcuate deflector valve will extend into the path of movement of heating fluid which will thus be directed into the branch passage.

The tapered engagement between valve stem and closure plug compensates for any frictional wear, eliminates the necessity for the provision of a gasket or other packing material, and effectively prevents any leakage of heating fluid around the valve. Necessity for repair or replacement has virtually been eliminated and practice has disclosed a far greater degree of efficiency of operation where a leakproof valve is thus provided.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. An adjustable supply T for a fluid flow system comprising a valve body, a passage through said body, a second passage joining the first, a substantially cylindrical valve chamber intersecting said passages and having its axis located above the axis of the first passage, a removable

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closure member in said valve body disposed axially of said valve chamber and having an outwardly tapered axial passage therethrough, said member being provided with an annular seating depression about said opening on the exterior surface thereof, a rotary valve in said chamber of a length substantially corresponding to the length of said chamber and with a transverse curvature substantially corresponding to the curvature of the chamber, said valve having a mounting portion in the form of a disc connected and disposed at right angles to its curved portion and of a diameter substantially corresponding to the diameter of the valve chamber so that pressure of fluid within said valve chamber will tend to urge said disc toward the corresponding end of the valve chamber, a valve stem fixedly attached to said disc and extending through said removable member and provided with an outwardly tapered portion complementary to said axial passage in said removable member, an operating member having an annular portion provided with opposed recesses and adapted to fit over the outer end of said stem, the outer end portion of said stem being provided with a transverse bore and a removable pin extending there-through and seating in said recesses for maintaining operative relationship between said operating member and said stem, and spring means seated in said annular depression and bearing against said operating member, the pressure exerted by said spring and by the fluid on said disc maintaining the tapered portion of said valve stem in firmly seating contact with the tapered passage in said closure member.

2. An adjustable supply T for a fluid flow system comprising a valve body, a passage through said body, a second passage joining the first, a substantially cylindrical valve chamber intersecting said passages and having its axis located above the axis of the first passage, a removable closure member in said valve body disposed axially of said valve chamber and having an outwardly tapered axial passage therethrough, said member being provided with an annular seating depression about said opening on the exterior surface thereof, a rotary valve in said chamber of a length substantially corresponding to the length of said chamber and with a transverse curvature substantially corresponding to the curvature of the chamber, said valve having a mounting portion in the form of a disc connected and disposed at right angles to its curved portion and of a diameter substantially corresponding to the diameter of the valve chamber so that pressure of fluid within said valve chamber will tend to urge said disc toward the corresponding end of the valve chamber, a valve stem fixedly attached to said disc and extending through said removable member and provided with an outwardly tapered portion complementary to said axial passage in said removable member, an operating member detachably connected to the outer end of said stem, and spring means seated in said annular depression and bearing against said operating member, the pressure exerted by said spring and by the fluid on said disc maintaining the tapered portion of said valve stem in firmly seating contact with the tapered passage in said closure member.

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