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M. DE LIN

LIQUID FLOW REGULATING VALVE

Filed Sept. 28, 1925

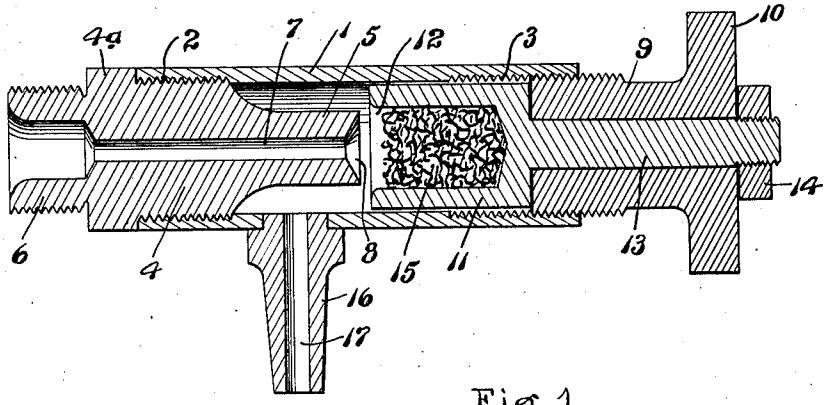

Fig. 1.

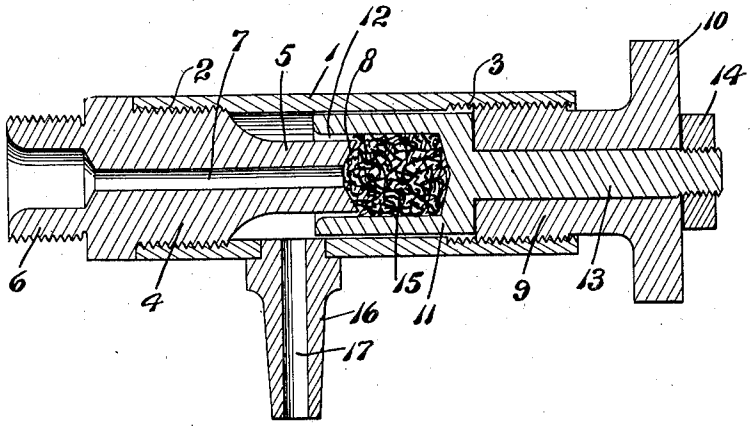

Fig. 2

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UNITED STATES PATENT OFFICE.

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LIQUID-FLOW-REGULATING VALVE.

Application filed September 28, 1925. Serial No. 58,998.

To all whom it may concern:

Be it known that I, MARTIN DE LIN, a citizen of the United States of America, residing at Holland, in the county of Ottawa and State of Michigan, have invented certain new and useful Improvements in Liquid-Flow-Regulating Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to water regulating valves and is particularly concerned with a valve by means of which the flow of water from a main water supply to a furnace humidifier may be properly regulated. In furnace humidifiers of the type shown in the pending application for patent of Oscar P. Nystrom, Serial Number 727,136, filed July 21, 1924, the water is continuously supplied to the humidifier from a source of water supply, and it is evident that the supply of continuously flowing water must be regulated so that there shall not only be sufficient water for humidifying purposes, but that at times, this regular supply may be increased or diminished; and during the regular operation of the humidifier, the passage of water must be substantially constant. Water supplied to furnaces in most instances, may contain sediment or may, when warmed, deposit scale or sediment, and it is necessary that this deposit shall not interfere with the proper passage of the water to the humidifier apparatus, and in case of the collection of sediment or scale, it must be easily removed.

My invention has for its primary object and purpose, the production of a regulating valve, simple in construction and inexpensive to manufacture, which has the above described qualities, and one which is durable and efficient in service.

For an understanding of the invention, reference may be had to the following description, taken in connection with the accompanying drawing, in which,

Fig. 1 is a longitudinal section taken centrally through the regulating valve, the parts being adjusted to permit free flow of water, and

Fig. 2 is a like view, the parts being adjusted for a limited flow of the water.

Like reference characters refer to like parts in the different figures of the drawing.

In the construction of the valve, a tubular sleeve 1 is used, being interiorly threaded at one end as indicated at 2, and also interiorly threaded at the opposite end, as shown at 3. Into the threaded end 2 of the sleeve a plug 4 is inserted, the same having an outer enlargement 4^a making a shoulder which comes against the end of the sleeve when the plug is fully inserted. The inner end of the plug is reduced in size and formed into a projecting neck 5 and the outer end of said plug is formed with an exteriorly threaded extension 6 to which connection may be made with any suitable pipe for carrying water from a water main or other source of water supply. A central longitudinal opening or passage 7 is made axially through the plug and the inner end of the neck 5 is formed, preferably, with a tapered or dished recess 8, as shown.

In the opposite threaded end 3 of the sleeve, an adjusting member 9 is threaded, the same being formed at its outer end with an enlargement 10 for ready operation of the adjusting member in or out of the sleeve. Within the sleeve and abutting at one end against the inner end of the member 9 is a cylindrical housing 11 formed with a cylindrical opening or recess 12 having a diameter somewhat larger than the diameter of the neck 5 of the plug 2. A stem 13 is formed integral with and extends from the outer end of the housing 11, passing freely through and axially of the adjusting member 9, its outer end being equipped with a nut 14 which holds the parts together. It is designed that the adjusting member may turn freely on the stem 13, the nut 14 not being drawn tight enough to bind the housing and adjusting member tightly together so as to cause the housing to rotate when the adjusting member is turned. Within the opening or recess 12 porous fibrous material 15 is placed. In practice this material is flax fibre, the best that I have found at this time for the purpose, but it is not to be understood that the invention is limited in use to the one kind of fibrous material.

Between the ends of the sleeve 1 and at its under side at a point under the reduced neck 5 of the plug 4, a nipple 16 having a longitudinal opening 17 centrally therethrough is secured, being secured in place in any suitable manner. This nipple serves to conduct

water downwardly, the same dropping from the lower end of the nipple to the humidifier apparatus.

With the construction described, the adjusting member may be operated inwardly so as to bring the fibrous material at 15 against the dished end of the neck 5 with a compression of the material. The neck freely enters the opening 12 and there are spaces left around the neck so that any water seeping through the fibrous material may flow to the nipple 16 and pass therethrough. The amount of the flow will depend upon the compression of the material 15, the harder it is compressed, the less the rate of flow. Accordingly, the flow of water may be regulated to the exact amount desired, and if it is so desired, it may be shut off entirely. The fibrous material freely expands with the removal of the pressure and the water will flow more freely on adjusting the adjusting member outward.

If at any time the fibrous material should be more or less clogged with sediment from the water it is necessary to merely move the adjusting member outwardly, moving the housing 11 and the material 15 therein outwardly away from the end of the neck 5, whereupon the full and free flow of the water will serve to flush said sediment from the fibrous material. If at any time the material becomes reduced in effectiveness, it is very easily replaced on removal of the adjusting member, and it is also evident that any stoppage of the passage 7 because of sediment deposits therein can be very easily corrected by removing the adjusting member and connected housing member placing the passage 7 in ready position for the entrance of a wire or other tool to open the passage. At times, it is desirable to pass the water in considerable amounts to the humidifier as when the same may have become dry and this is easily accomplished by moving the adjusting member outwardly to the position substantially that shown in Fig. 1, returning the adjusting member to the position shown in Fig. 2 after the required amount of water has been passed. At different times of the year and with the fire in the furnace at different intensities, the passage of water to the humidifier needs to be varied and this is very easily accomplished.

One feature of my invention which is of particular value is contained in the fibrous material that is located within the part 11 and pressed against by the stem 5. This material may be compressed to a greater or less degree and absorbs water in many ways similar to a sponge. When the same is saturated the excess drains out through the clearance space between said part 11 and the stem 5. The more the sponge-like material is compressed the less will be the flow and the flow of liquid can be regulated to substantial exactness with this construction.

While I have described this device as having particular utility in connection with furnace humidifiers it is not to be considered that the invention is restricted in any way to the one place of use. There are many other places where a regulation of the flow of a liquid is desirable and in which the device of my invention is of great utility. The construction shown and described is simple to manufacture, all parts thereof beirg readily manufactured in quantity on an automatic screw machine. The invention is defined in the appended claims and is to be considered as comprehensive of all forms of structure coming within their scope and in no sense restricted to any one particular character of use or limited in any way as to use or structure other than as required by said claims.

I claim:

1. A liquid flow regulating valve comprising a sleeve, a plug closing one end of the sleeve, said plug having a longitudinal passage therethrough and formed at its inner end with an inwardly projecting neck of reduced size, an adjusting member adjustably mounted in the opposite end of the sleeve and movable back and forth therein, a housing member substantially cup-shaped located at the inner end of the adjusting member, means connecting the housing member to the adjusting member to move longitudinally therewith, said housing member at its inner end being formed with an opening or recess of larger cross sectional dimensions than the cross sectional dimensions of said neck, fibrous material located in said opening against which the inner end of said neck may be pressed, and an outlet to the sleeve located between the plug and housing member at one side of said neck, substantially as described.

2. A liquid flow regulating valve, comprising a cylindrical sleeve interiorly threaded at both ends, a plug threaded into one end of the sleeve, said plug having a longitudinal passage therethrough and formed at its inner end portion with an inwardly extending neck of reduced diameter, an adjusting member threaded into the opposite end of the sleeve having a longitudinal opening therethrough, a cup-shaped housing located at the inner end of the adjusting member having an opening or recess formed at its inner end in alinement with the said neck and larger in diameter than the diameter of said neck, a reduced stem extending from said housing through the opening in the adjusting member, means at the outer end of said stem securing the housing and adjusting member together, compressible and expansible porous material located in the opening in said housing,

and an outlet nipple connected to the sleeve at its lower side and under said neck.

3. A liquid flow regulating valve, comprising an elongated sleeve, means closing one end of the sleeve having a passage therethrough for the passage of liquid into the sleeve, means adjustably mounted in the opposite end of the sleeve for movements lengthwise of the sleeve, a member connected with the last named means movable lengthwise of the sleeve with said means, said member carrying a mass of porous expansible and compressible material adapted to be brought against the first means and compressed between said means and said member, and an outlet to the sleeve at a point between its ends for the escape of liquid passing through said material.

4. In a device of the character described, a sleeve, means for closing one end of the sleeve having a passage therethrough for the passage of liquid, a body of flax fibres located within the sleeve, means adjustably mounted in the opposite end of the sleeve closing said end of the sleeve adapted to force said body of flax fibres against the inner end of said first means, and an outlet to the sleeve between its ends for the escape of liquid passed through said fibrous body.

In testimony whereof I affix my signature.

MARTIN DE LIN.