June 14, 1932. H. G. WEYMOUTH ET AL 1,862,916

STRAINER FOR MECHANICAL REFRIGERATION

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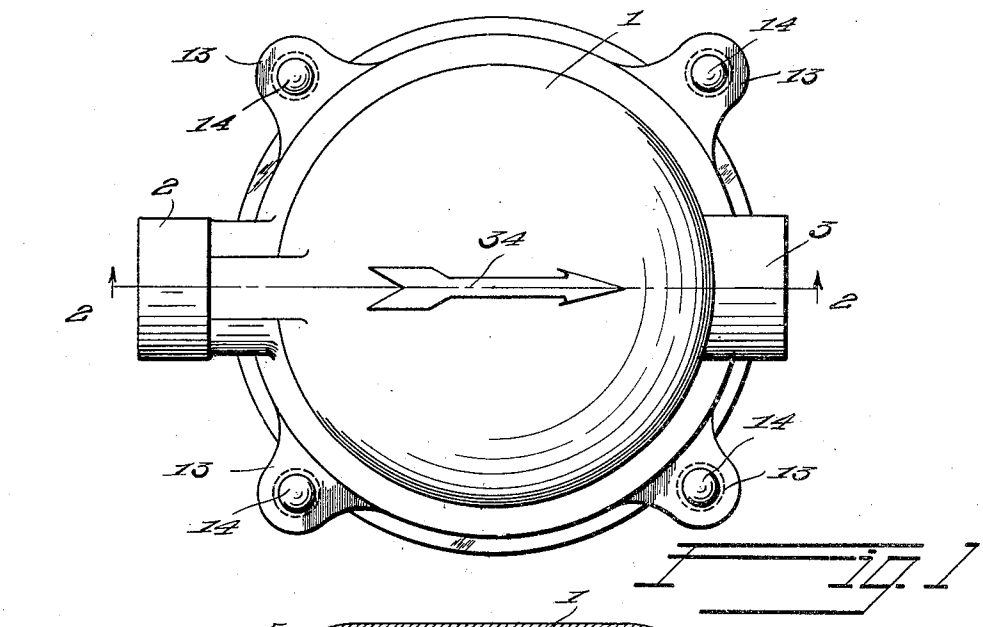


FIG. 1

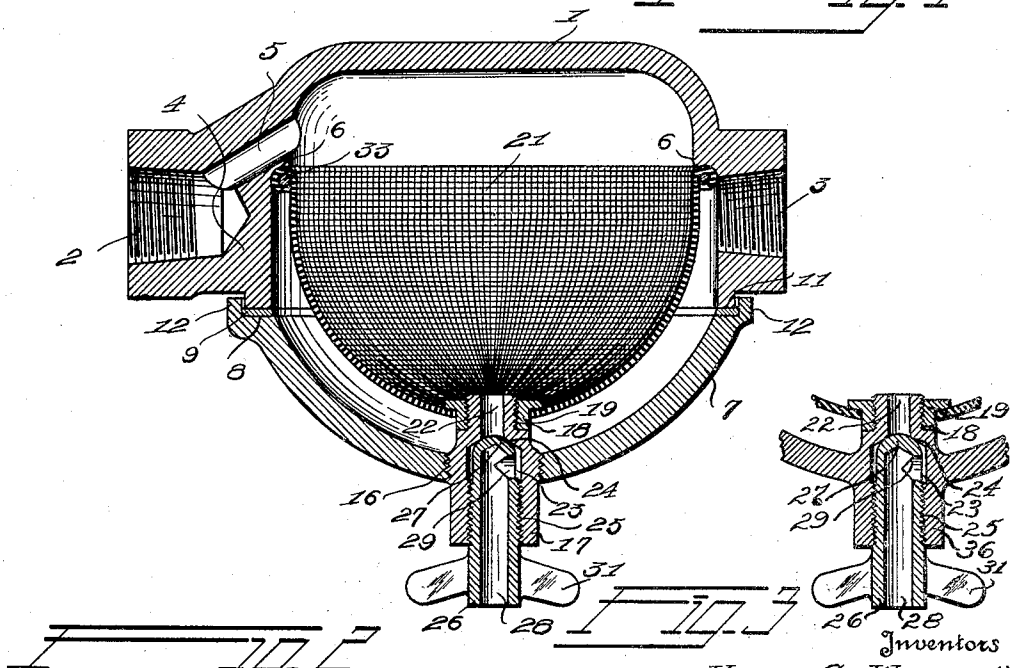


FIG. 2

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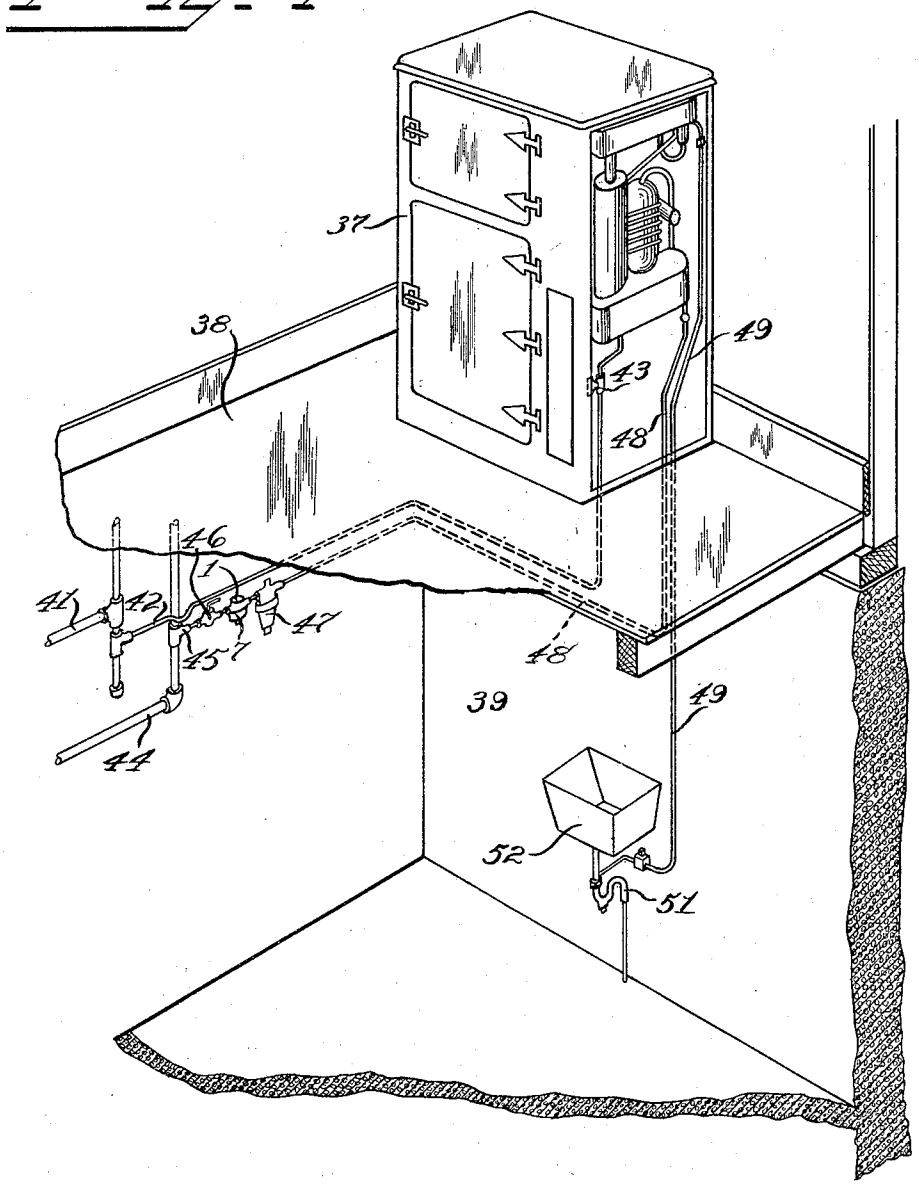
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Fig. 4



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UNITED STATES PATENT OFFICE

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STRAINER FOR MECHANICAL REFRIGERATION

Application filed February 10, 1930. Serial No. 427,330.

This invention, relates to a combined drain valve and strainer for use particularly in a refrigerating system although not limited to such use.

In several forms of mechanical refrigerators now in use it is necessary that water be continually circulated through cooling coils of the refrigerator. Since the cooling coils generally have passageways of small diameter, it is essential to efficient operation that the cooling water be free of sediment and foreign matter as far as possible, since such sediment will quickly be deposited within the cooling coils and either cause complete stoppage of flow or seriously cut down the quantity thereof.

One object of this invention therefore is to provide a readily accessible strainer for removing all detrimental foreign matter from the cooling liquid of a mechanical refrigerator.

Mechanical refrigerators of the type having a cooling coil usually circulate water from the city mains directly through the coil. However it is necessary to materially reduce the pressure of the water in the main and such reduction of pressure may be simply accomplished by the interposition of a pressure regulator. In many cases these regulators must reduce the water pressure 50 to 100 pounds, since the pressure in the mains may be from 60 to 110 pounds and the pressures desirable in the cooling coils are from 10 to 15 pounds. The pressure regulators used for these reductions of pressure have comparatively small passageways, and for efficient operation it is necessary that these passageways be kept clear of sediment and foreign matter.

Another object of the invention therefore is the interposition of a strainer and sediment trap between the water main and the pressure regulator of the cooling system of a mechanical refrigerator whereby sediment and foreign matter are effectively removed from the cooling liquid prior to the passage of the liquid through the regulator.

Another object of this invention is to provide combined drain valve and strainer which may be readily positioned against the ceiling of the cellar of a residence having a mechanical refrigerator for example, and in which the parts are readily disassociated for cleaning, and in which the sediment entrained with the liquid is caught in the strainer prior to its passage through the cooling coils of the refrigerator.

Another object of this invention is to provide a strainer of the above indicated character which has associated therewith a draining and flushing valve which is readily accessible, whereby water may be flushed through the strainer and out the drain valve to thus flush and cleanse the strainer without disassembling the parts.

Another object of this invention is to provide a combined strainer and sediment trap of the above type in which the strainer may be readily removed from the remaining structure without disconnecting the device from the pipe line, and in which the strainer embodies a flexible screen that is yieldingly held in position, because of its inherent resilience, when the removable member that carries it is secured in operative position.

These and various other objects of the invention will be apparent from the following description and the appended claims when taken in connection with the accompanying drawings; wherein

Figure 1 is a top plan of our combined strainer and drain valve body.

Figure 2 is a section taken substantially on line 2—2 of Figure 1.

Figure 3 is a broken section similar to Figure 2 showing a slight modification.

Figure 4 is a diagrammatic showing of a refrigerator connected up to the gas and water mains for operation, showing the positioning of our improved strainer.

The combined strainer and drain valve are shown in detail in Figs. 1, 2 and 3 and will be described first. Referring to Figs. 1 and 2, the main upper casting 1 is centrally chambered, and has an inlet connection 2 and an outlet connection 3, said connections being screw-threaded for the reception of the pipe lines. The connection 2 may be connected to a pipe leading from the ice refrigerator, and the connection 3 may be connected to a

pipe leading to a sewer or other outlet disposal. A wall 4 extends upwardly adjacent the inlet connection 2, and a passageway 5 extends from the inlet connection 2 above the wall 4 and into the central chamber of the casting 1. The casting 1 within the chamber has an annular shoulder 6 therein, which shoulder is positioned just above the outlet connection 3 and just below the passageway 5. The casting 1 is adapted to be inserted in the drain line usually positioned adjacent the ceiling of the cellar and is adapted to detachably receive the bottom plate 7.

The bottom plate 7 is formed as a shallow cup having a flat flange 8 thereon adapted to cooperate in close fitting engagement with a flange 11 on the body portion 1, said flanges 8 and 11 enclosing therebetween a gasket 9. The cup-shaped member 7 has an upwardly extending flange 12 at the edge thereof and adjacent the flange 8 to center the member 7 and to retain the washer 9 in position in order to prevent said washer from spreading outwardly when the members are clamped together. The upper casting 1 has outwardly extending lugs 13 having screw-threaded apertures therein for the reception of bolts 14, the lower casting 7 having corresponding lugs through which the threaded bolts 14 pass, the members 7 and 1 thus being clamped in fluid tight engagement when the bolts 14 are screwed in position.

The bottom casting 7 has a central screw-threaded opening 16 adapted for the reception of a correspondingly theraded valve body 17. Valve body 17 is reduced adjacent its upper end and is externally threaded as at 18 for threaded engagement with a flanged collar 19 which is rigidly secured to a cup shaped screen 21. Said screen 21 is usually formed of a fine mesh wire screen made of Monel metal, and the collar 19 may be secured thereto as by welding, soldering or brazing.

The valve body 17 has a central bore 22 therein communicating at its lower end with an enlarged bore 23, shoulder 24 being positioned at the junction of the bores 22 and 23. The valve body 17 is interiorly threaded at the lower end thereof, as at 25, for the reception of a correspondingly threaded valve member 26. Valve member 26 has a curved end 27 adapted for engagement with the shoulder 24 for closing off the passageway 22 when the valve is screwed upwardly in position. The valve member 26 has a central bore 28 therein communicating with the bore 23 of the valve body by way of an opening 29 adjacent the upper closed end of the valve member 26. The valve member is provided with wings 31 integral therewith to provide a ready means of rotating said member.

The upper end of the screen member 21 is secured to a wire ring 33, as by bending around said ring, and the screen with the ring 33, attached thereto is adapted to firmly abut against the shoulder 6 of the body 1 when the member 7 is secured in operative position.

The body portion 1 may be provided with an indicating arrow 34 to aid in connecting our improved combined screen and drain with the line, the arrow indicating the normal direction of flow of liquid through the device.

It will be noted that the screen is entirely supported by the lower cup-shaped member 7, and is therefore readily detachable from the body portion 1 by removal of bolts 14. When bolts 14 are removed the cup-shaped member 7 may be detached from the body 1, carrying with it the screen and the drain valve connection.

The operation of the device is as follows: The body portion 1 is permanently connected in the cooling line of a refrigerator, usually being positioned against the ceiling of the cellar below the refrigerator and with the inlet connection of the pipe line secured at the connection 2 and the outlet pipe leading to the refrigerator connected at the connection 3. The screen 21, having the collar 19 thereon, may then be threaded on the valve body 17 of the cup-shaped plate 7 and the parts assembled. The gasket 9 will prevent leakage between the two body portions of the drain connection, and the upwardly extending flange 12 will prevent the washer from being pressed outwardly to allow leakage at this point. The screen 21 is usually made of such depth that the upper end thereof including the wire 33 will firmly engage against the shoulder 6 when the bolts 14 are secured in position, such that there will be no tendency for screen 21 to come unscrewed from the valve body 17. Since the screen will yield, because of its inherent resilience, the bolts 14 may be tightened to insure that no leakage occurs between the body 1 and member 7. Liquid entering the inlet connection 2 will pass by way of passageway 5 into the screen 21, through screen 21, and outwardly by way of the connection 3. Any sediment entrained with the liquid will be effectively entrapped in the screen 21.

If the screen becomes clogged sufficiently to require flushing, such flushing may be easily accomplished without disconnecting the mechanism from the line and without interfering with the normal flow of liquid. The device and the pipe leading thereto may be flushed by simply turning the wings 31, thus screwing the valve member 26 downwardly to remove the curved end 27 thereof away from the shoulder 24, thus opening passage-way 22 to the enlarged passage 23. Liquid may thus drain through passage 22, opening 29 and passage 23 and outwardly by way

of the bore 28, to thus flush out the entire device.

If the screen becomes clogged sufficiently to require further cleaning, the lower casing or plate 7 may be readily detached from the casing 1 by removing the bolt 14, and the entire screen, the lower casing 7 and valve mechanism may be thus removed and cleaned.

In the modification shown in Figure 3 the valve body 36 is made integral with the lower casting 7, said body 36 having the screw-threaded portions 18 and 25 similar to the corresponding portions shown in Figure 2. By having the valve body and lower casting in one piece, the number of parts is reduced and the possibility of leakage between these members is avoided. With the exception of this change, the parts of Figure 3 are the same as in Figure 2 and are not described in detail, similar reference characters indicating like parts.

Referring now to Fig. 4 wherein the strainer is shown in association with a refrigerator, the refrigerator as a whole is designated by reference character 37, being positioned as shown on the floor 38 above a cellar 39. The refrigerator shown operates by gas, and gas is supplied thereto from the gas main 41 by a pipe 42 having a cut-off valve 43 therein.

Water for cooling purposes is supplied from the water main 44 by way of a connection 45 through a cut-off valve 46, our improved strainer 1, a pressure regulator 47 and pipe 48. After circulation through the refrigerator the water is drained through pipe 49 to a drain connection 51, shown in this instance as the drain pipe of the wash tub 52.

It will thus be seen that our strainer is placed in a readily accessible position, and where it will prevent the entrance of all foreign matter and sediment into the pressure regulator as well as into the cooling coils of the refrigerator. The draining and flushing valve may be easily manipulated and the screen may be easily removed when necessary.

The operation of the valve for flushing purposes is simple, and the assembled parts are not subject to ready derangement. Our device as a whole is cheap to manufacture, simple to install, and thoroughly reliable in use, and is easily separated for thorough cleaning.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What we claim and desire to secure by United States Letters Patent is:—

1. In a combined drain and strainer for use in the water cooling lines of mechanical refrigeration systems, a cylindrical housing having an open bottom and closed top, the axis of which extends transversely to the direction of flow therethrough; inlet and outlet connections located near the top of the said housing and extending radially therefrom; a substantially cup shaped closure for the open bottom of said housing and a substantially cup shaped screen located within said closure; said closure and screen being in spaced cooperating nested relationship, the upper portion of said housing being reduced in diameter defining a chamber with which said inlet connection communicates, the said reduced portion defining a downwardly facing shoulder or annular seat against which the upper periphery of said screen abuts, the lower edge of the housing defining a downwardly facing annular seat against which the upper edge of said closure seats in sealing relation; and releasable means holding said closure and screen in clamping relation with their respective seats, whereby, when said means are released said closure and screen may be dropped away from said housing for cleaning or other purposes.

2. In a combined drain and strainer, a vertical cylindrical housing having inlet and outlet connections, the lower portion of said housing terminating in a cup; a substantially cup shaped screen mounted in said housing in nesting relationship thereto, the walls of the cup portion of said housing being spaced from, and substantially parallel to the walls of said screen, thereby defining a chamber; said inlet connection communicating with the interior of said screen; and said outlet connection communicating with said chamber; a sleeve threaded into the bottom of the housing and extended upwardly and threaded into a sleeve secured in an aperture in the said screen; said first named sleeve having a valve therein, whereby said screen may be cleaned of any waste material contained therein by merely opening said valve.

In testimony whereof we affix our signatures.

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