

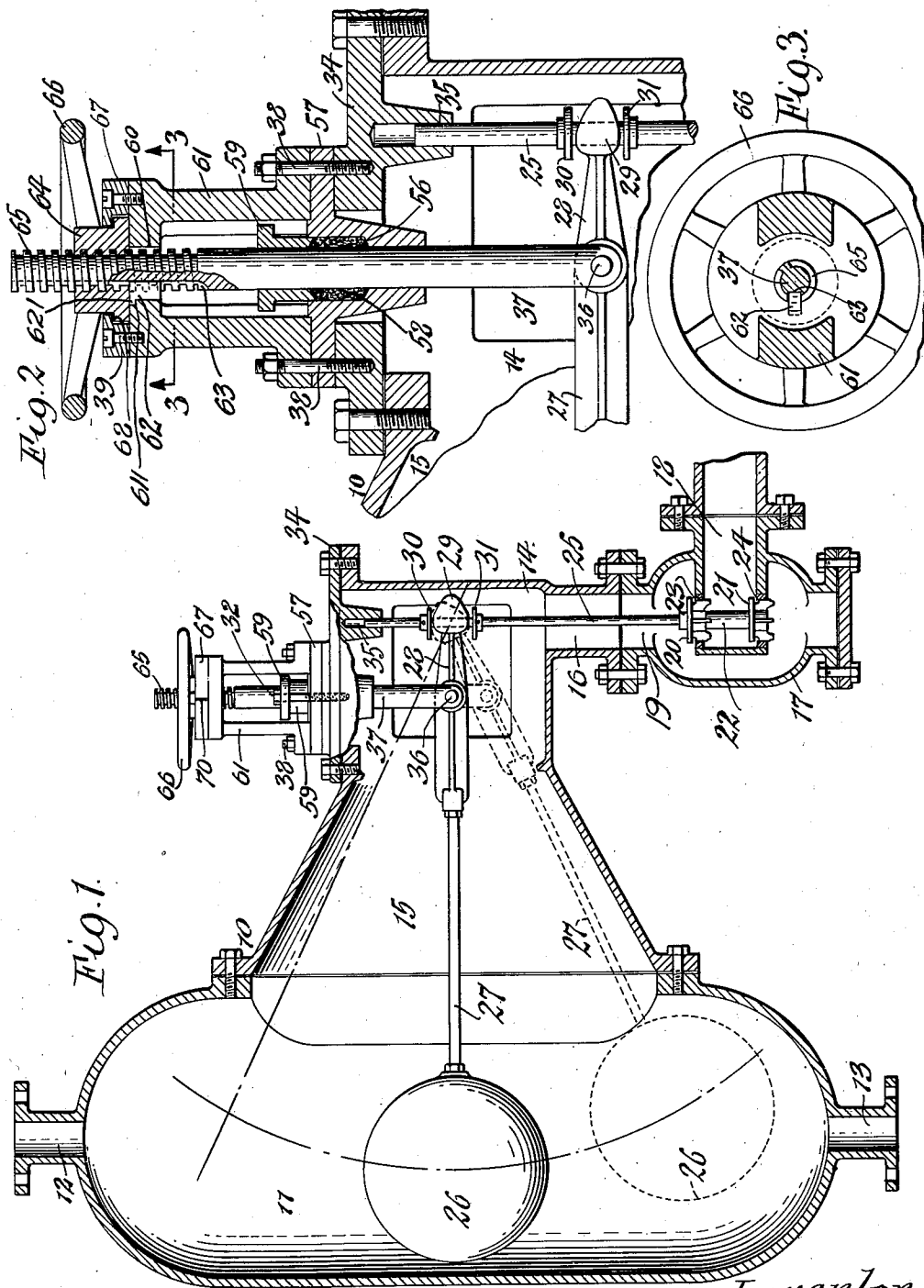
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SCREW AND NUT GEARING

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SCREW AND NUT GEARING

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1 Claim. (Cl. 74-424.8)

This invention relates to a liquid level control mechanism which is more particularly designed for use in connection with an evaporator or similar installation for maintaining the liquid therein at a predetermined level.

The object of this invention is to provide a mechanism of this character which is efficient and reliable in operation and capable of being easily adjusted from the exterior of the inclosing casing and which is simple in construction and not liable to get out of order.

This application is a division of an application filed May 21, 1937 and serially numbered 144,025. In the accompanying drawing:

Fig. 1 is a vertical section of a liquid level control mechanism constructed in accordance with this invention.

Fig. 2 is a fragmentary vertical section, on an enlarged scale, of the means for adjusting this control mechanism.

Fig. 3 is a horizontal section taken on line 3-3, Fig. 2.

In the following description similar characters of reference indicate like parts in the several figures of the drawing.

The inclosing casing or housing 10 containing the liquid chamber of the liquid level control mechanism may be of any suitable form but, as shown in Fig. 1, the same preferably comprises an upright float chamber 11 provided at its upper and lower ends with upper and lower tubular connectors 12, 13 which are adapted to be connected with the interior space of the evaporator above and below the normal variation of the liquid level therein.

At one side of the float chamber is arranged an operating chamber 14 which is connected with the float chamber 11 by a hollow neck 15 which tapers from the float chamber to the operating chamber and connects the same so that the interior of the float chamber, operating chamber and neck practically form one liquid space in which the level of the liquid rises and falls during the operation of the apparatus.

On its underside the operating chamber is provided with a tubular inlet 16 for the admission of the liquid which is to be evaporated. The entrance of this liquid may be controlled by a valve device of any suitable construction but preferably is of the balanced type and comprises a hollow valve body 17 having an inlet 18 at one side thereof which connects with a liquid supply and an outlet 19 which connects with the inlet 16 of the operating chamber, and two valve disks 20, 21 connected by a stem 22 and movable vertically

in unison toward and from valve seats 23, 24 formed around ports in the valve body and leading from the upper and lower parts of the liquid inlet 18 to the internal space of the valve body, as shown in Fig. 1.

From the valve stem 22 a valve rod 25 extends upwardly through the outlet 19 of the valve body, the inlet 16 of the casing and into the operating chamber of the latter. This valve rod together with the parts connected therewith is adapted to be raised and lowered by a float mechanism for opening and closing the inlet valve in response to the variations in the level of the liquid in the casing, which float mechanism is preferably constructed as follows:

The numeral 26 represents a float which preferably has the form of a ball and which rises and falls with the level of the liquid in the float chamber. Motion is transmitted from this float to the valve rod by a float lever arranged horizontally in the casing and having a float arm 27 connected with the float and a shifting arm 28 which is operatively connected with the valve rod. This connection is preferably of such character that a slight slack in or lost motion is possible between the float lever and the valve rod and this is accomplished in the present case by making the outer end of the float lever arm in the form of a fork which straddles the valve rod and providing each branch of this fork with a bearing head 29, the upper and lower sides of which are adapted to engage with upper and lower bearing collars 30, 31 secured to the adjacent part of the valve rod.

As the float rises during an increasing height of the liquid level in the casing the float lever is moved so that the lower sides of the bearing heads 29 engage with the lower collar 31 of the valve rod and move the latter downwardly, whereby the control valve is closed when the liquid has risen to the predetermined level in the casing 10 and no further liquid is admitted into the same. When the float descends in response to a lowering of the liquid level in the casing below the normal height then the float lever is moved in the opposite direction and the bearing heads on its shifting arm engage their upper sides with the upper collar 30 and raise the same together with the valve rod, whereby the control valve is opened and liquid is admitted to the casing for restoring the level of the same therein. The upper end of the valve rod 25 is guided in a tube 35 formed on the underside of a plate 34 which is detachably secured to the top of the chamber 14.

During its rocking movement the float lever

turns on a horizontal fulcrum which in the present case consists of a pivot pin 36 passing transversely through the float lever. In the operation of an evaporator it sometimes is necessary or desirable to raise or lower this fulcrum for the purpose of raising or lowering the liquid level which is to be maintained in the evaporator. Heretofore this has been usually accomplished by means which were wholly within the casing of the float valve mechanism and this necessitated interrupting the operation of the apparatus and also dismantling parts of the same in order to gain access to the internal parts whereby this adjustment was effected.

The improved means for adjusting the fulcrum of the float lever are so organized that the same can be manipulated from the exterior of the casing and without removing any parts or stopping the operation of the evaporator for this purpose. As shown in the drawing the improved means for adjusting the fulcrum of the float lever vertically are constructed as follows:

The numeral 37 represents an upright fulcrum bar or rod, the lower bifurcated end of which straddles the float lever and supports opposite ends of the fulcrum or pivot pin 36.

The central part of the upright fulcrum rod or bar 37 passes through a stuffing box on the cover plate 34 of the operating chamber 14, which stuffing box comprises a pocket 56 surrounding the fulcrum rod and formed in a plate 57 mounted on the cover 34, a packing 58 arranged in this pocket around said rod, and a gland 59 surrounding this rod and pressing against the top of said packing, said gland being secured to the plate 57 by screws 32. The upper part of said fulcrum rod 37 passes through an opening 60 in the upper part of a bracket 61 mounted on the plate 57 and is capable of moving vertically therein but is held against turning by a key 62 in the opening of said bracket engaging with a longitudinal keyway 63 in said fulcrum rod. The key is held against upward movement by engaging its upper end with the

underside of the nut 64 and against downward movement by a laterally projecting lug 621 on the key engaging with an upwardly facing shoulder 611 on the bracket 61. The bracket 61 and stuffing box plate 57 are secured to the cover plate 37 by bolts 33. Above the bracket is arranged a rotatable screw nut 64 which engages with a screw thread 65 on the upper part of the fulcrum rod and is adapted to be turned by a hand wheel 66 formed on this nut. Vertical movement of this nut is prevented by resting its lower end on the upper end of the bracket 61 and providing a retaining ring or keeper 67 which is detachably connected by screws 39 to the upper side of the bracket and overhangs an upwardly facing shoulder 68 on this screw nut. This keeper is split, as shown at 70 in Fig. 1, in order to permit of applying the same to the nut and removing the same therefrom.

Upon turning the screw nut 64 by means of the hand wheel 66 in one direction or the other the fulcrum rod 37 may be raised or lowered and thus position the fulcrum 36 of the float lever and the float mounted therein in accordance with the level at which it is desired to maintain the liquid in the evaporator.

I claim as my invention:

The combination with a support, a bracket mounted on said support and having an opening, and a rod having a screw threaded part and a keyway arranged in said opening; of means for adjusting said rod lengthwise including a key mounted on said bracket and engaging with said keyway and provided with a laterally projecting lug which engages with an upwardly facing shoulder on said bracket, a screw nut engaging its underside with said bracket and key and rotatable on the screw thread of said rod and provided with an upwardly facing shoulder, and a split keeper having its parts secured to said bracket and engaging the shoulder of the screw nut on opposite sides of the axis of said rod.

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