

Aug. 17, 1926.

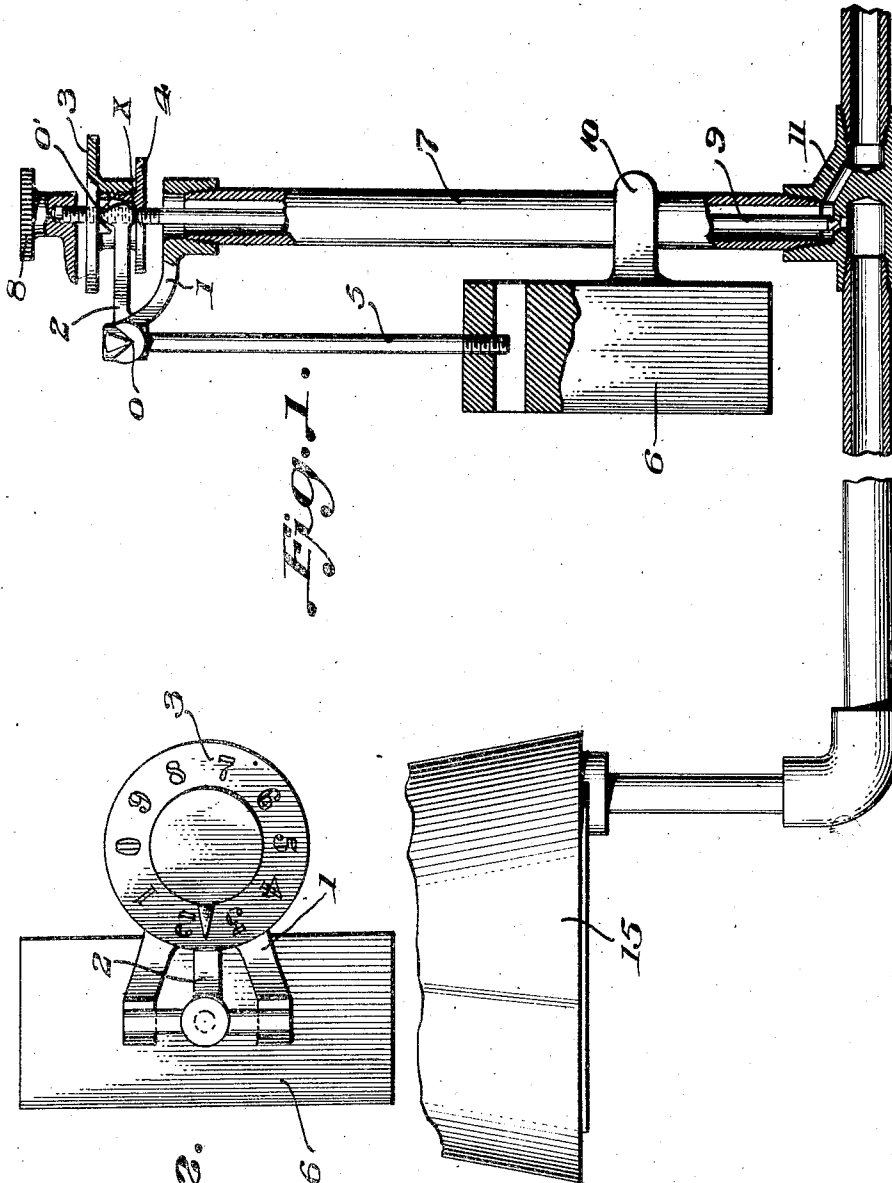
1,596,770

H. M. SHEER

SELF REGULATING VALVE

Filed Jan. 21, 1925

2 Sheets-Sheet 1



Inventor,
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By *Vernon E. Hedges* his Atty.

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Fig. 3.

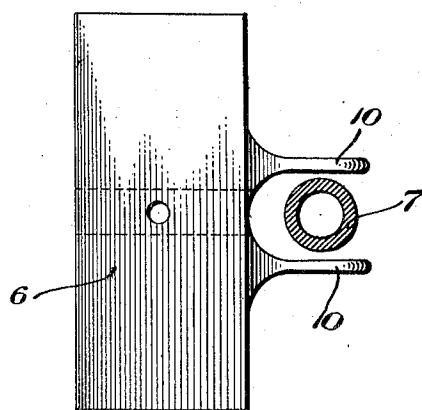


Fig. 5.

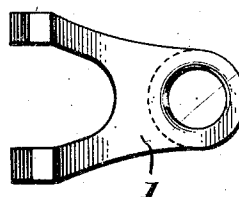


Fig. 6.

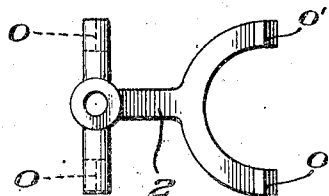


Fig. 4.

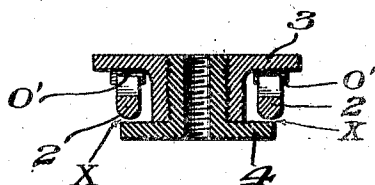


Fig. 7.

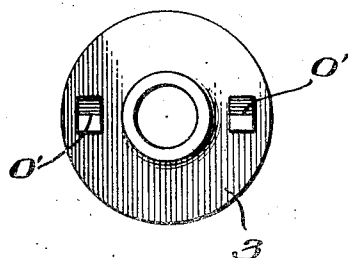
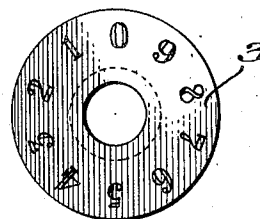


Fig. 8.



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UNITED STATES PATENT OFFICE.

HENRY M. SHEER, OF QUINCY, ILLINOIS.

SELF-REGULATING VALVE.

Application filed January 21, 1925. Serial No. 3,887.

My invention relates to an improvement in self-regulating valves.

The object of this valve is to compensate for any variation in the flow of oil from the supply reservoir or container to the burner, due to raising or lowering the burner, thereby preventing the burner from flooding with oil, this self-regulating valve operating independently of the valve proper, and its adjustment can be made without affecting the action of the device.

It is only when the heater is tilted, the burner is lowered, or the oil tank raised that this self-regulating valve is brought into action. In normal operation, the heater is intended to be level, and rest firmly on the floor.

In the accompanying drawings:

Fig. 1 is a side view with parts broken away;

Fig. 2 is a plan;

Fig. 3 is a view looking down on the weight;

Fig. 4 is a transverse vertical section through the upper end of the device;

Fig. 5 is a view of the bracket;

Fig. 6 is a view of the connecting-arm;

Fig. 7 is a bottom plan view of the dial; and

Fig. 8 is a top view of the same.

A valve 11 is interposed between the sections of the feed-pipe, the ends of which are preferably screwed thereto. Screwed into this valve is an upright pipe 7 of sufficient length to support the operating mechanism of the device. This mechanism consists of a weight 6 supported by a rod 5, which is screwed into the upper end of the weight, and also the connecting-arm 2. This connecting-arm is provided with knife or scale bearings 0, which in turn are supported by bracket 1 screwed to the upper end of the upright pipe 7. The lugs 10 on the weight 6 straddle the pipe 7, and are to prevent the weight from being accidentally swung to one side thereby tipping the connecting-arm 2 from its bearings.

The needle valve stem 9 extends through and above the upright pipe 7, and is threaded on the upper end. Screwed onto this threaded portion of the valve stem is the flanged bushing 4, which receives the numbered dial 3, the latter resting on the connecting-arm 2 at knife-bearings 0'. This makes the entire valve stem assembly floating, and friction is reduced to a minimum

by the use of the knife or scale bearings 0 and 0'. The flanged bushing 4 is screwed into the dial from beneath, and set so that there is just a little play between the bushing and the ball point on the knife-bearings 0', as at X. This serves to keep the knife bearing 0' in place, and to give a positive action to the valve stem.

After a brooder equipped with this self-acting valve has been put into operation, if the floor should warp from moisture, and raise the oil-container (not shown), an increase in oil pressure at the valve would result. As the oil container is raised, however, the angle of the pipe 7 changes, causing the weight 6 to swing away from the upright pipe 7 to close partly the valve 11, and to take care of increased oil pressure. In case the burner is raised, oil pressure is reduced and by the weight swinging toward the upright pipe 7, the valve will open and allow more oil to flow to the burner. If the burner is raised so far that the valve is opened, wide, there would be no danger of flooding, as the oil groove of the burner would be above the oil level in the oil container, and the flame would go out.

A knob with pointer 8 secured on the upper end of the valve stem 9 is provided for the adjustment of the valve.

My improved valve may be adjusted like any ordinary globe or needle-valve by turning this pointer 8 quite independently of the compensating and self-adjusting feature, as will be readily understood, as in this way the normal relation of the needle-valve 9 to its seat in the valve 11 is accurately adjusted. It is only when the heater is tilted, the burner lowered, or the oil tank raised that the self-adjusting feature is brought into action. In normal operation, the heater is intended to be level and rest firmly on the floor, and the oil flow to the burner is controlled by means of the needle-valve 9 through adjusting-knob 8. But in case the floor should spring or warp, which apparently happens all too often, as is evidenced by the number of fires reported, the self-adjusting mechanism will control the valve-stem 9, closing the valve in direct proportion to the distance the oil-container may be raised or the burner lowered out of normal, so that the flow of oil, that is the quantity delivered to the burner, will remain approximately uniform.

The weight 6 on the rod 5 swings like a

pendulum and acts on the needle-valve 9 through the arm 2. Scale beam bearings 0 and 0' are used throughout, thus reducing friction to a minimum.

Thus it will be seen that my improved valve automatically controls the amount of oil delivered to the burner, and as a consequence, it also controls the flame. In other words, this improved valve will automatically maintain the same size of flame, whether the burner is lowered or the oil container is raised, an inch or more from normal operating level. As the burner is lowered, or the oil container is raised, the valve will act in direct proportion to the distance the oil container is raised or the burner is lowered. Extinguishing the flame is only intended as a last resort, and only takes place after the burner is lowered or oil container is raised far enough to close the needle-valve.

The length of the arm 2 and taper of the needle-point or valve will determine how far the burner can drop before the valve is fully closed. To those unfamiliar with conditions encountered in brooder-houses, such as warping of the floor boards and the springiness of the floor, which is often the case, the advantages of my improved compensating valve cannot be fully appreciated. For example, when adjusting the flame the weight of the operator is placed on the floor close to the brooder-heater. If the floor is springy, the flame, itself, will change as soon as the weight of the operator is removed. My improved compensating valve entirely overcomes this trouble and with its use, there is no appreciable change in the flame due to these conditions. Fires have occurred where operators have stated under oath, that just a short time before the brooder had been examined, the tank refilled with oil, and the flame adjusted, and that it was burning a perfect and proper size flame. These fires have always occurred in buildings with wooden floors, principally in the cheaply constructed wooden floor brooder-houses. It is conditions like these, that my invention contemplates and it effectively overcomes these dangers and difficulties.

I claim:

1. A valve mechanism including an upwardly extending valve casing, a valve stem extending upwardly through said casing, a laterally extending support mounted on said casing and projecting outwardly therefrom, a laterally extending connecting rod pivotally mounted on said support and operatively connected with said valve stem for actuating said stem, and gravity actuated means suspended from the outer end of said connecting rod for operating said rod and the valve stem.

2. A valve mechanism including a frame, a valve stem, means operatively connected

with said valve stem for actuating the same, and arms extending outwardly from said means and embracing a portion of the frame for limiting lateral movement of said means relative to the frame.

3. A valve mechanism including a valve casing, a valve, a connecting rod connected with and for operating said valve, said connecting rod having scale beam bearings pivotally connected with the valve casing, and gravity controlled means for actuating said connecting rod.

4. A valve mechanism including a valve stem, a plate mounted thereon, a second plate spaced apart from said first-mentioned plate and adjustable longitudinally of said valve stem and relative to said first-mentioned plate, and means interposed between the plates for operating the valve stem.

5. A valve mechanism including a valve stem, a plate mounted thereon and having a sleeve extending outwardly therefrom, a second plate adjustably mounted on said sleeve, and means interposed between the plates for operating the valve stem.

6. A valve mechanism including a valve stem, a plate mounted thereon and having a hub portion, a second plate spaced apart from said first-mentioned plate and detachably secured to said hub portion, and means interposed between the plates for operating the valve stem.

7. A self-regulating valve including a valve-seat, an upright pipe, a needle-valve, a connecting-arm having scale beam bearings pivotally connected with the upper end of the pipe and with the needle-valve stem, and a weight suspended from the connecting-arm.

8. A self-regulating valve including a valve-seat, an upright pipe, a needle-valve, a connecting-arm having scale beam bearings pivotally connected with the upper end of the pipe and with the needle-valve stem, a weight suspended from the connecting-arm, and means extending from the weight and loosely embracing the upright pipe to define the pendulum-like movement of the weight.

9. The combination of a supply pipe, a valve interposed between sections thereof and having a valve-seat, an upright pipe extending from the valve, a bracket at the upper end thereof, a connecting-arm pivoted to the bracket, a weight suspended from the arm, a needle-valve stem protruding at its upper end above the upright pipe, a dial secured to the protruding end of the needle-valve stem, and to which one end of the connecting-arm is pivoted, and a pointer secured on the upper end of the needle-valve stem for adjusting the needle-valve.

10. The combination of a supply pipe, a valve interposed between sections thereof and having a valve-seat, an upright pipe

extending from the valve, a bracket at the upper end thereof, a connecting-arm pivoted to the bracket, a weight suspended from the arm, a needle-valve stem protruding at its upper end above the upright pipe, a dial secured to the protruding end of the needle-valve stem, and to which one end of the connecting-arm is pivoted, a pointer secured on the upper end of the needle-valve stem for adjusting the needle-valve, and a flanged-bushing screwed into the dial and provided with sockets adapted to be set to allow slight play between the flange and bearings on the under side of the dial.

In testimony whereof I affix my signature.

HENRY M. SHEER.