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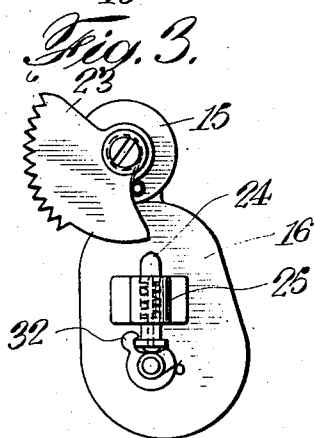
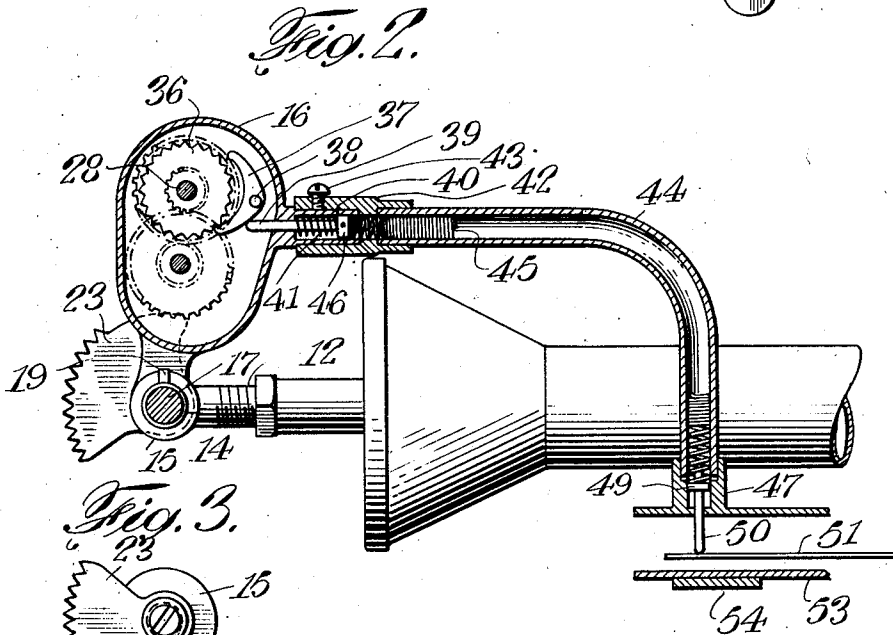
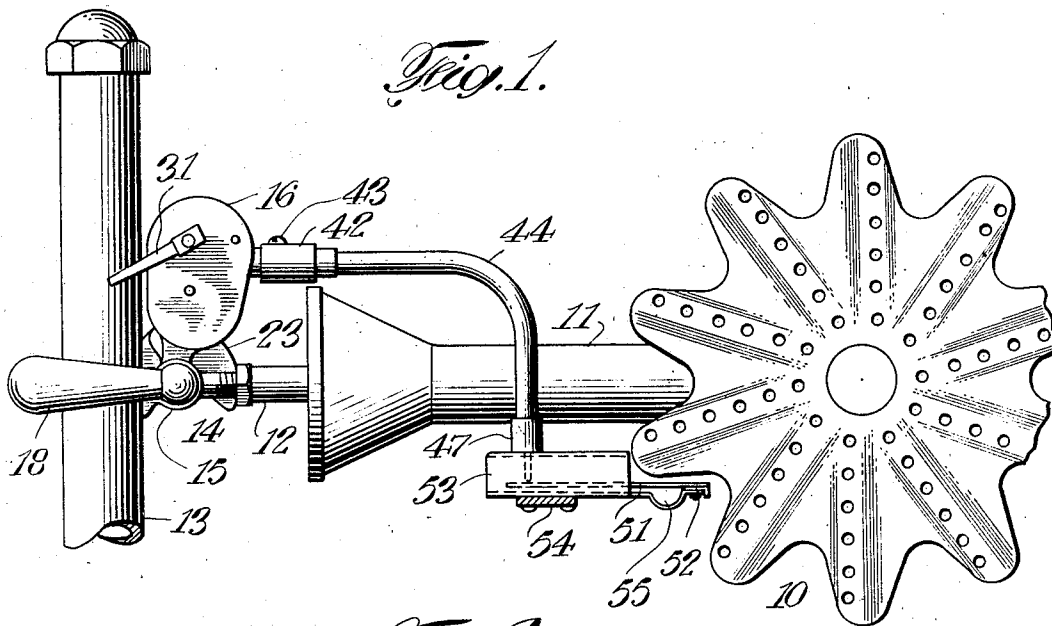
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SAFETY ATTACHMENT FOR GAS BURNERS

Filed April 30, 1928

2 Sheets-Sheet 1



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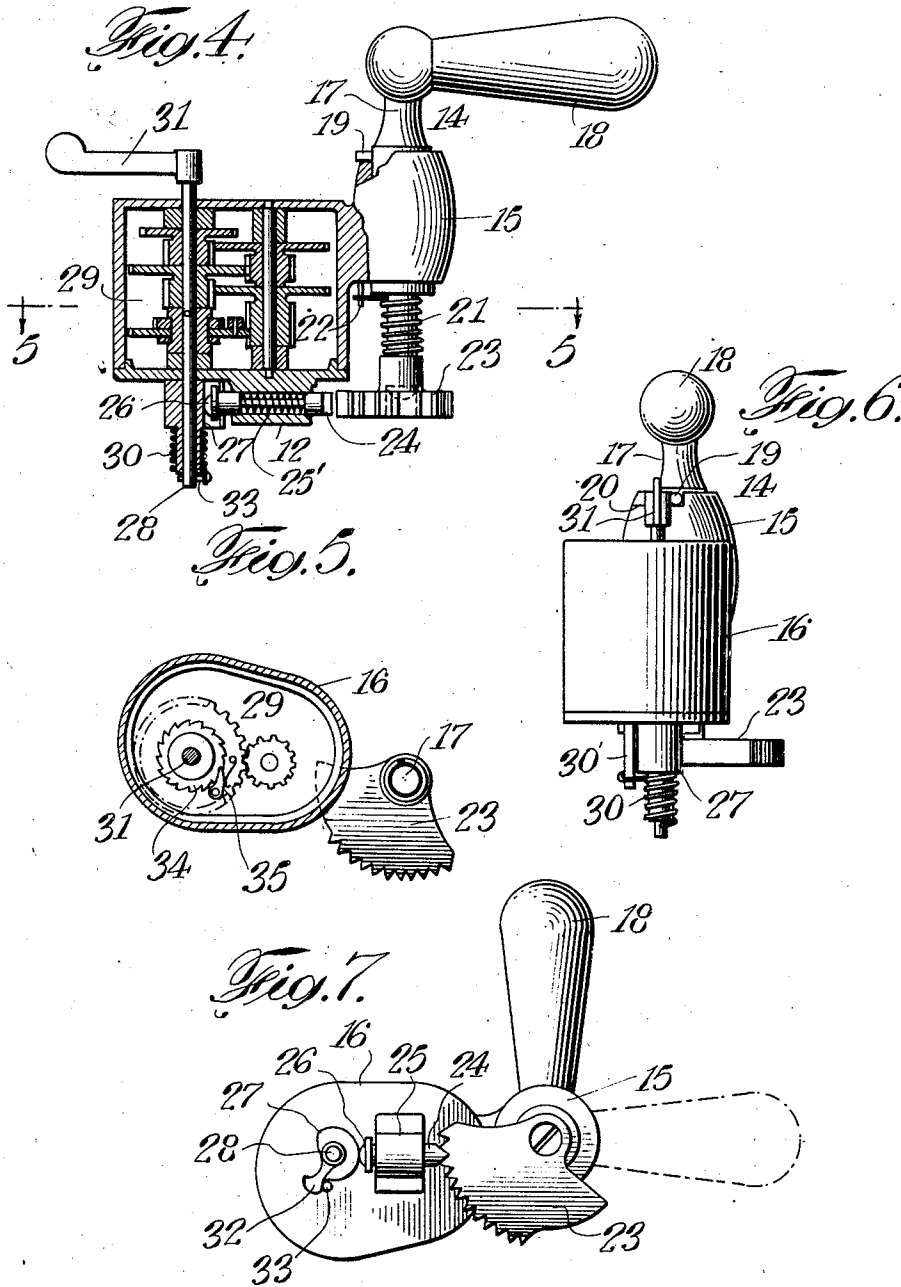
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SAFETY ATTACHMENT FOR GAS BURNERS

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UNITED STATES PATENT OFFICE

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SAFETY ATTACHMENT FOR GAS BURNERS

Application filed April 30, 1928. Serial No. 273,361.

My invention relates to improvements in safety attachments for gas burners, and the object of my invention is to produce a device controlled by the heat of the burner and acting in a positive and reliable manner to turn off the gas supply in case the flame becomes extinguished, or in case of accident to any part of the apparatus. I am aware that there are many inventions having this general object in view, but as a rule they are not absolutely reliable, and failure is serious. In my invention I provide a self closing valve for the gas supply, so that if it is turned on by a child or inadvertently by others, it will close before any dangerous amount of gas can pass. I also use in connection with the burner and within the zone of its heat, a thermostat which is not unusual, but I interpose between the self closing valve and the thermostat a clockwork gear train which can be wound up by a slight turn of the handle, and which when wound will actuate a locking device to hold the self closing valve open so that the gas may pass. This clockwork gear train is locked to prevent movement by the action of the thermostat, and if the thermostat or connections are destroyed, or the flame of the burner extinguished, then the gear train starts up, and after a short movement will release the self closing valve so that the latter instantly closes and cuts off the burner supply. My invention is also intended to produce a structure of such a nature that there is no danger of its getting out of order, and as before remarked, if by any unusual accident the parts become deranged, then the gas supply will be shut off automatically.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a plan view of a burner provided with my improved attachment.

Figure 2 is a broken sectional plan of the apparatus.

Figure 3 is a bottom plan of a part of the apparatus.

Figure 4 is a sectional elevation showing the arrangement of the valve, the gear train, and the connection between the two.

Figure 5 is a section on the line 5—5 of Figure 4.

Figure 6 is a rear elevation of a part of the apparatus, and

Figure 7 is a bottom plan with the gear train locked to the stem of the self closing valve.

I have shown the improvement in connection with a burner 10, mixing tube 11, gas pipe 12, main supply pipe 13, and valve 15 of conventional type, with the understanding that other forms of these parts can be used without affecting the invention. The casing 15 of the valve is connected with a housing 16 for the gear train 29 which will be hereinafter referred to, and the valve proper is not shown because it is of the usual or any preferred kind, except that its stem 17 is prolonged to extend downward through the casing as shown clearly in Figure 4.

I have shown the stem with the conventional actuating handle 18 and with a pin 19 moving in a seat 20 to limit the movement of the valve in either direction. The valve 14 is normally closed by the tension of the spring 21 (see Figure 4) which is wound around the lower part of the stem, is secured at one end to a pin 22 and at the other to the stem 17, so that when the handle 18 is released after the valve has been opened, the tension of the spring 21 will close it. The valve stem has at its lower part a ratchet 23 which serves as the medium for locking the valve in open position, but ordinarily the ratchet 23 is free as shown in Figures 3 and 4 so that the valve cannot be left open but will be closed by its spring.

The ratchet 23 can be engaged and fixed

in its position by a detent 24 which slides in and out with reference to the ratchet, and will engage it so as to hold it against the tension of its spring, but will permit it to be turned by hand when the handle 18 is moved. The detent slides in the casing 25 on the bottom of the housing 16, and is normally retracted, that is moved from ratchet 23 by a spring 25'. At its outer end it has an anti-friction head 26 which rides on a cam 27 which is carried by a shaft 28 of the gear train 29. This gear train is held in the housing 16, and is not described in detail because it can be any usual movement similar to that in alarm clocks, for example. It is turned in one direction by a spring 30 on the reduced end of the cam 27, which is fast to the shaft 28 and to a pin 30', and in the opposite direction that is to wind it up, by a handle 31.

The cam 27 has a projection 32 engaging a pin 33 to limit its movement. Any usual connection between the shaft 28 and the gear train for winding the latter can be used, and I have shown the conventional ratchet wheel 34 (see Figure 5) which is engaged by a pawl 35 on one of the gears of the train.

When the handle 31 is turned in one direction, it tensions the spring 30, and when the handle is released, the tendency is for the train to turn back in the opposite direction. When the handle is turned to wind up the gear train, the cam 27 riding on the end 26 of the detent 24, throws the detent into engagement with the ratchet 23, or in the path of its teeth, so as to be engaged by them, and the operation of the two parts will be described in detail later.

On the shaft 28 is a wheel 36 having teeth which are engaged by the oscillating pawl 37 to lock the gear train against unwinding. This particular means is the usual one, and any pawl and wheel and ratchet connection can be substituted for it, or it can be differently located in the gear train. The pawl 37 is shown pivoted at 38, and is actuated to engage the wheel 36 by the pin 39 which moves in a nipple 40 projecting from the casing 16, and the pin is normally pushed back out of engagement with the pawl by the light spring 41.

The coupling 42 which is held by a screw 43 fits over the nipple 40 and serves to connect with the flexible tube 44 which extends to the vicinity of the burner 10, and which encases a spiral spring 45 which extends through the tube and is rather closely wound so that it will have an endwise movement under the thermostatic pressure presently referred to, but is not wound so closely as to distort the thermostat in case it is highly heated, as will presently appear.

The spring or flexible shaft 45 at one end abuts with the head 46 of the pin 39, and at the other end it abuts with the head 49 of the pin 50 which moves in a hollow bracket or nipple 47 on the thermostat carrying chan-

nel 53. The protruding end of the pin 50 is in the path of the thermostat plate 51 of conventional structure which is held at one end as shown at 52 where it is attached to a prolongation of the channel 53 in which the thermostat is guided. The structure of the thermostat is such that when it is heated it has a tendency to coil or curve towards the pin 50, and obviously this will move the pin and through the shaft or spring 45 will move the pin 39 so as to push the pawl 37 into engagement with the wheel 36 and prevent the unwinding of the gear train 29 so long as the thermostat is heated.

It will be seen, now, that if the spring 45 is not too tightly coiled, it can yield somewhat after the pressure gets rather heavy upon it, and prevent any distortion of the thermostat 51 which might result if there were no lost motion in the spring or shaft.

The channel 53 can be supported in any convenient way, and I have shown it attached to a bracket 54 which in turn can be attached to any convenient support.

From the foregoing description the structure of the apparatus will be understood, and its operation is as follows. If the valve 14 is opened by the handle 18 and released, it immediately closes, and there is no burning of gas. If, however, the valve is opened, the gas lighted, and the handle 31 turned to wind up the gear train 29, the detent 24 will be forced into engagement with the ratchet 23 or into its path, and as soon as this engagement occurs the valve is held open. The burner having been lighted, it will begin to throw heat on the thermostat 51, and it will be noticed by reference to Figure 1 that there is a recess behind the thermostat to allow the heat to envelope it, and as the thermostat acts it locks the gear train in the manner already described so that as long as the burner is lighted the gear train will be locked and the valve 14 will be held open. In this connection it will be noticed that the valve can be adjusted by hand to regulate the size of the flame, just as in ordinary valves, because the detent 24 under the stronger action of the hand will slide over the teeth of 23 as the valve stem is turned. If, however, the flame is extinguished at the burner, then the thermostat 51 resumes its former position, the pin 39 is retracted, the gear train 29 begins to unwind, and after a moment the cam 27 will be moved so as to release the detent 24 and the valve 14 will close.

The clockwork mechanism has only a short movement, and it will release the valve 14 before any injurious amount of gas can have passed through the burner. It will be seen that if the thermostat should be burnt off, or the connected parts adjacent to it broken by any accident, then the pin 39 would be released and the gear train would unwind, releasing the valve 14 to its self clos-

ing action. It will be further noticed that the attachment which I have provided does not in any way interfere with the free setting or control of the gas valve 14, that the gear can be of a length which will give time for the heat of the burner to actuate the thermostat so as to lock the gear train and hold the valve 14 open before the latter will automatically close, and that therefore the structure is not in the least inconvenient, and provides for positive closing of the supply valve in case the burner is extinguished or in case of accident to parts adjacent to it.

I claim:—

1. A safety attachment for gas burners comprising a self closing valve regulating the gas supply to a burner, a thermostat in the heat zone of the burner, a clockwork gear train normally disconnected from the aforesaid gas valve, means for connecting the gear train to the stem of the gas valve when the gear train is wound up, and means controlled by the aforesaid thermostat for locking the gear train against unwinding.

2. A safety attachment for gas burners comprising a self closing valve regulating the gas supply to a burner, a thermostat in the heat zone of the burner, a ratchet having a plurality of stops on the stem of the aforesaid gas valve, a clockwork gear train, a detent actuated by winding up the gear train engaging the aforesaid ratchet, and means controlled by the aforesaid thermostat for locking the gear train against unwinding.

3. A safety attachment for gas burners comprising a self closing valve regulating the gas supply to a burner, a thermostat in the heat zone of the burner, a ratchet on the stem of the aforesaid valve, a clockwork gear train, a detent engaging the aforesaid ratchet, a cam actuated by the winding up of the gear train to move the detent into engagement with the ratchet, and means actuated by the thermostat for locking the gear train against unwinding.

4. A safety attachment for gas burners comprising a self closing valve regulating the gas supply to a burner, a thermostat in the heat zone of the burner, a manually wound spring gear train, means actuated by winding the gear train to connect it operatively with the aforesaid valve and acting by the unwinding of the gear train to release the valve, and means controlled by the thermostat for locking the gear train.

5. In a structure of the kind described, the combination with a self closing valve, a gear train intermittently connecting with said valve, and a thermostat, of an elastic shaft between said thermostat and said gear train, said shaft being moved lengthwise by said thermostat, and means actuated by said extension of the shaft to lock the gear train.

6. In a structure of the kind described, the combination with a self closing valve, a gear

train intermittently connecting with said valve, and a thermostat, of a flexible extensible shaft interposed between said thermostat and said gear train and acted on by said thermostat, an enclosing tube for said shaft and means actuated by the movement of the shaft to lock the gear train.

In testimony whereof, I have signed my name to this specification this 27th day of April, 1928.

OTTO MOHR. 75