June 30, 1942. M. RABINOWICZ 2,288,208

MEANS FOR CONTROLLING THE SUPPLY OF GAS TO BURNERS

Filed May 6, 1939 2 Sheets-Sheet 1

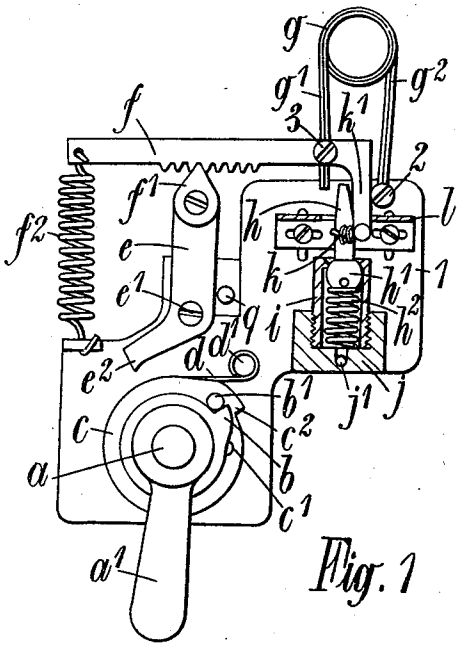


Fig. 1

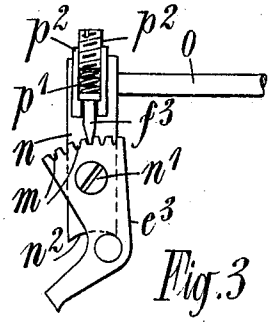


Fig. 3

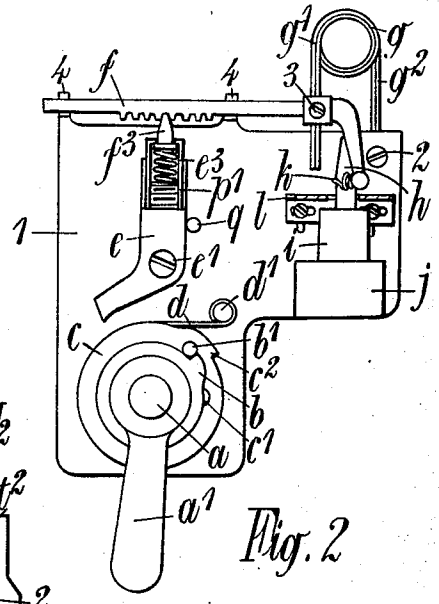
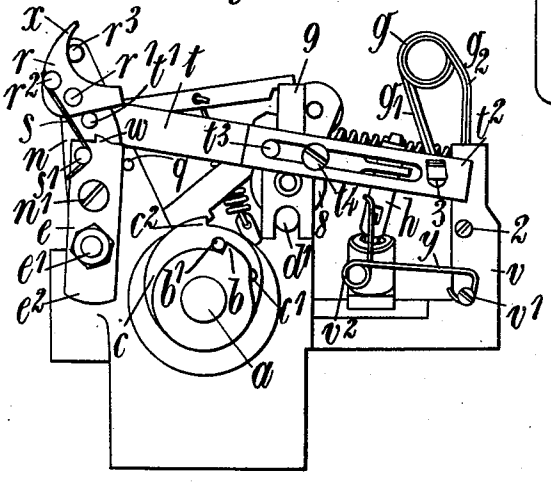


Fig. 2

Fig. 4



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MEANS FOR CONTROLLING THE SUPPLY OF GAS TO BURNERS

Filed May 6, 1939 2 Sheets-Sheet 2

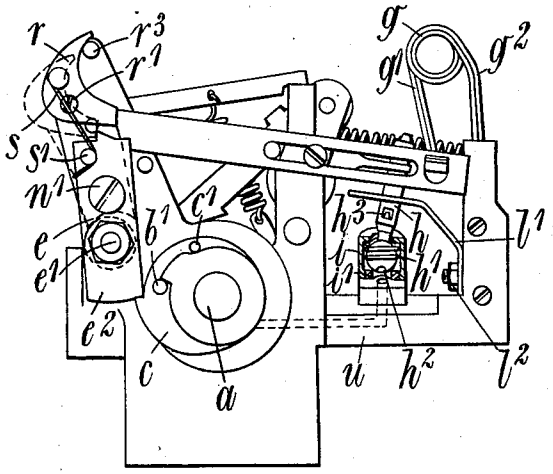


Fig. 5

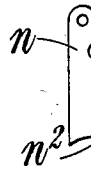


Fig. 7

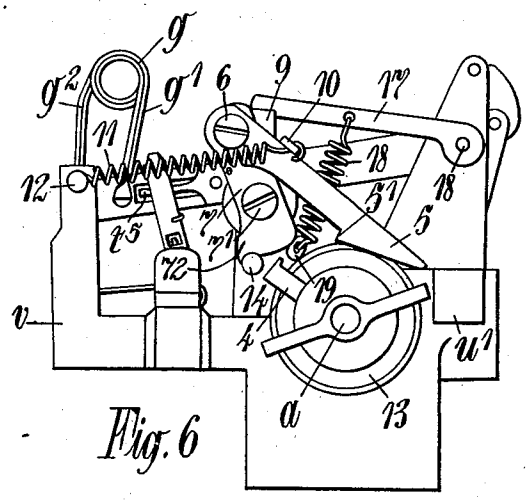


Fig. 6

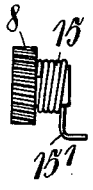


Fig. 9

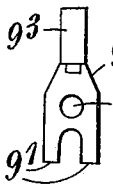


Fig. 8

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Patented June 30, 1942 2,288,208

UNITED STATES PATENT OFFICE

2,288,208

MEANS FOR CONTROLLING THE SUPPLY OF GAS TO BURNERS

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Application May 6, 1939, Serial No. 272,274
In Great Britain May 10, 1938

11 Claims. (Cl. 158—117.1)

This invention relates to gas burners of the type having means for automatically turning off the gas supply in the event of the burner, or a pilot burner co-operating therewith, being extinguished, locking means controlled by a thermostat heated by the main burner or pilot burner being provided for retaining the gas tap in the open position.

A great drawback of the thermostat control means employed in connection with such gas burners is the length of time which must elapse after lighting the burner or pilot burner before the locking means for the gas tap comes into action, necessitating the gas tap being held in the open position for an inconveniently long time. Similarly, on the burner being accidentally extinguished, a considerable time elapses before the locking means comes out of action, whereby a large volume of gas may in some cases escape before the means for automatically turning off the gas supply can come into action.

The present invention has for its object to remove this drawback and provide locking means for the gas tap which will come into and out of action with the minimum of delay. With this object in view, the movement of the locking member which retains the gas tap in the open position against the action of the automatic closing means is limited to an amount sufficient to ensure its engagement and disengagement, the said locking member being connected up to the thermostat by means of a slip drive comprising a driving connection which enables the thermostat to withdraw the locking member positively from its operative position during the initial cooling of the thermostat, the arrangement being such that the thermostat, during its initial contraction, moves the locking member out of its operative position, the slip drive permitting further expansion and contraction of the thermostat, respectively, without influencing the locking member.

According to one embodiment of the invention, the slip drive comprises a toothed rack operatively connected to the thermostat and pressed yieldingly into engagement with a tooth or teeth provided on the locking member or on an actuating member connected to the locking member, so as to enable the rack to overrun the locking member after the latter has moved into one or the other of its end positions. The rack may be pressed into engagement with the tooth or teeth by means of a spring, e. g. a tension spring attached to one end of the rack, the other end of the rack being connected to the thermostat, so as to enable the rack to be reciprocated by the expansion and contraction of the thermostat. The rack may, however, be guided in fixed guides and engage a spring-pressed tooth or pin on the locking member or on the actuating member connected thereto.

According to another embodiment, the locking member is operated by a lever arm having ratchet teeth thereon forming a toothed arc, which is engaged by a pin mounted on a sliding bar connected to the thermostat, the said pin being pressed into engagement by means of a spring.

According to a further embodiment of the invention, the slip drive comprises a positive driving connection for withdrawing the locking member, means being provided for interrupting the positive driving connection during the continued cooling of the thermostat, the slip drive also comprising a yielding driving connection for moving the locking member into its operative position during the initial heating of the thermostat and permitting the thermostat to continue its expansion after the locking member has moved into its operative position and allowing the positive driving connection to be restored. In the case of the last mentioned embodiment, the driving connection comprises a driving element, e. g. a pawl, which is urged into engagement with the locking member for instance by means of a spring and which during the continued contraction of the thermostat after the locking member has been withdrawn from its operative position, is disengaged from the locking member. The spring which urges the pawl into engagement with the locking member may also serve for providing the yielding driving connection for moving the locking member into its operative position, thereby simplifying the construction of the locking means as a whole. The disengagement of the pawl is preferably effected by means of a fixed stop which is engaged by a tail on the pawl during the continued cooling of the thermostat.

The invention is illustrated by way of example in the accompanying drawings, in which

Fig. 1 is a side elevation of one constructional form of the invention,

Fig. 2 is a side elevation of a second constructional form,

Fig. 3 shows a modification of the slip drive,

Figs. 4 and 5 are diagrammatic side elevations of a further constructional form showing the parts in different positions,

Fig. 6 is a side elevation of the reverse side of Fig. 5, and

Figs. 7 to 9 show details of the constructional form of the invention illustrated in Fig. 2.

Referring to the drawings, in the constructional form shown in Fig. 1, *a* is the spindle of the gas tap to which is fixed the handle *a'* and a disc having a tooth *b* which coacts with a pin *b'* on a disc *c* which is loosely rotatable around the spindle *a*. A clock spring *d* is attached at one end to a fixed pin *d'*, the spring *d* being coiled around the spindle *a* and attached at its other end to a pin *c'* fixed on the disc *c*, the arrangement being such that the spring *d* turns the disc *c* and the latter, through the driving connection formed by the pin *b'* and the tooth *b*, turns the spindle of the gas tap clockwise into the closed position of the tap. In order to maintain the gas tap in the open position, a locking member is provided comprising a cranked lever *e* pivoted at *e'* on a fixed pivot and having a tooth e^2 which is adapted to engage the tooth c^2 on the disc *c* when the tap is in the full open position. The lever *e* is also provided with a tooth *f'* which coacts with the teeth of a rack member *f* which is attached at one end to a thermostat comprising a bimetallic strip formed into a coil *g*, one end *g'* of which is attached to the rack and the other end g^2 to the baseplate **1** which supports the parts of the apparatus, the ends of the thermostat being fixed in position by means of screws **2** and **3**, respectively. The other end of the rack has a coil spring f^2 attached thereto, the opposite end of which is fixed to the baseplate **1**, so as to press the rack into engagement with the tooth *f'*.

The thermostat may be heated by arranging it in such a position that it is heated by the gas burner but it is preferable to heat the thermostat by means of a pilot jet *h*. When the thermostat, as shown comprises a bi-metallic strip, it is preferable to provide means for tilting the pilot burner away from the thermostat after the locking member has come into action. For this purpose the pilot burner *h* is movable inside a casing *i* and is provided with an apertured ball end *h'* which is pressed by means of a spring h^2 into close contact with a seating at the upper end of the casing, the pilot jet tube *h* projecting through the said upper end and being capable of rocking so as to direct the pilot flame towards or away from the coil *g*. The casing *i* is screwed into a fitting *j* to which gas is supplied through a bore *j'*. A flexible connecting device, e. g. a coil spring *k* is attached at one end to an arm *k'* depending from the rack *f*, the other end of the spring being provided with a loop which encircles the pilot burner *h*. The end of the arm *k'* is located in such a position that the spring *k* only tilts the burner *h* away from the thermostat as the latter approaches the limit of its movement i. e. after the end *g'* has moved away from the limb g^2 to almost its full extent, and tilts the burner *h* back again into its fully operative position during the initial part of the return movement of the thermostat occasioned by the extinguishing of the pilot flame. By this means the pilot flame plays on the thermostat for a sufficient time after it has commenced to expand to ensure that proper engagement of the locking means takes place, while allowing the burner to return to its operative position immediately disengagement of the locking means has taken place, so as to be ready to come into action immediately the pilot burner is relighted. Instead of the spring being attached to the arm *k'* it may be connected up to the thermostat directly.

The connection of the pilot burner to the thermostat or to the rack or other device controlled thereby, by means of a spring or other flexible connecting member considerably facilitates the adjustment of the pilot burner, in addition to simplifying the construction of the operating means therefor. By mounting the pilot burner in a universal mounting in the manner above described, the correct adjustment of the pilot burner is considerably simplified and it is only necessary to provide a parallel guide for the pilot burner tube having stops for limiting the extent of movement of the tube. Normally the pilot burner is arranged to move in the horizontal direction as shown, so that by arranging the parallel guide, the line of travel of the burner tube may be varied as desired. In Fig. 1, the parallel guide comprises a plate *l* having a slot through which the burner tube *h* projects, the said plate being adjustable horizontally as well as vertically, so as to enable the length of travel and the location of the end positions of the burner to be adjusted to suit requirements.

In the constructional form shown in Fig. 2 the rack *f* moves in fixed guides **4** and engages a spring pressed tooth f^3 which is housed in a casing e^3 fixed on or as shown integral with the detent *e*, forming the locking member. In this case the movable limb of the thermostat is connected up to the rack *f* midway between its ends so as to provide a more rigid connection. Otherwise the constructional form shown in Fig. 2 is the same as that shown in Fig. 1.

Instead of providing a spring-pressed tooth on the detent *e*, the latter may have a lever connected to it or forming part of it and having an arcuate end surface with a plurality of V-shaped grooves therein, a rocking member provided with a spring-pressed tooth or pin being pivoted on the said lever, the said tooth or pin engaging the V-shaped grooves and the rocking member being connected up to the thermostat, for instance by means of a connecting rod or link. In the constructional form illustrated in Fig. 3, the lever is integral with the detent e^3, the upper arcuate end being provided with a plurality of V-shaped notches or grooves *m* which are engaged by a rocking member pivoted on the detent at *n'* and connected up to the thermostat by means of a connecting rod *o*, one end of which is pivotally connected to the member *n* by means of a stud or crankpin fixed on the rear side of the member *n*. Integral with or fixed to the member *n* is a tubular spring casing *p* through the lower end of which passes a tooth or pin f^3 having a shoulder against which bears a helical spring *p'* which bears at its upper end against a screw p^2 which is screwed into the upper end of the casing and serves for regulating the force of the spring *p'*. The inner or lower end of the member *n* is forked or, as shown in Fig. 3, is provided with a notch n^2 which straddles the pivot *n'* so as to limit the extent of relative movement between the detent *e* and the rocking member *n*.

In the constructional forms above described, on the pilot flame being lit and playing on the coil *g* the end *g'* of the thermostat (Figs. 1 and 2) moves to the left, the gas tap having in the meantime been turned anti-clockwise so as to bring the tooth c^2 into position for engagement by the tooth e^2 of the locking member *e*, the retractive movement of which is limited by means

of a pin q to an extent just sufficient to enable the tooth e^2 to become disengaged from the tooth c^2. During the initial movement of the end g' of the thermostat, the tooth e^2 comes into engagement with the tooth c^2 and thereby retains the gas tap in the open position against the action of the closing spring d the force of the spring f^2 or p' being sufficient to enable the tooth e^2 to be moved positively into and out of engagement with the tooth c^2. During the continued expansion of the thermostat, however, the spring is overcome and the rack overrides the tooth f' (Fig. 1) or the tooth f^3 (Fig. 2), or, in the case of Fig. 3, the tooth f^3 is forced out of the notches in the arcuate upper end of the lever e^3, thus allowing the thermostat to expand to its full extent without exerting any further action on the locking member. Towards the end of the expansion movement of the thermostat, the spring k which acts on the burner tube h in the manner of a snap-over mechanism, tilts the tube away from the coil g, so that the latter is no longer subjected to the full intensity of the heat from the pilot flame. In a similar manner, when the thermostat cools due to the pilot flame being extinguished, the initial return movement of the end g' withdraws the tooth e^2 out of engagement with the tooth c^2 and after the movement of the locking member e has been arrested by the pin q the driving connection between the tooth and the rack or notches in the arcuate end of the locking member yields, thereby allowing the end g' of the thermostat to return to its initial position without further action on the locking member.

The locking member e may be connected up to the thermostat through the intermediary of a ratchet coupling comprising a toothed coupling disc fixed to the member e and concentric with the pivot e', the said coupling disc co-operating with a coupling disc co-axial therewith and provided with a lever arm which is operatively connected to the thermostat through a coupling rod.

Referring to Figs. 4 to 9, the spindle a of the gas tap has a disc with a tooth b fixed thereon which coacts with a pin b' on a disc c which is loosely rotatable around the spindle a and is turned clockwise by a clock spring (not shown) one end of which is fixed to the pin d' and the other to the pin c' in a similar manner to that shown in Fig. 1. The gas tap is maintained in the open position by means of a locking member e pivoted at e' on a fixed pivot and the lower end of which forms a tooth e^2 which is adapted to engage the tooth c^2 on the disc c. The locking member e is provided with a pivot n' on which is mounted a rocking member n (shown separately in Fig. 7) which is connected up to the end g' of the thermostat g by means of a connecting rod, one end of which is connected to the rocking member n by means of a pivot t'. The end g' of the thermostat is twisted and formed into a hook 3 which passes through a hole in the end of the connecting rod remote from the pivot t'. On the upper end of the rocking member n is pivoted at r' a pawl r constituting a driving element which is urged into engagement with a tooth w on the upper end of the locking member e by means of a spring s comprising a strip or wire, the lower end of which is bent aside and engages behind the edge of the member e and the upper end of which bears against a stud r^2 fixed on the pawl r, the spring s intermediate its ends being coiled around a stud s' fixed on the locking member e. The spring s constitutes a yielding driving connection between the rocking member n and the locking member e and enables the connecting rod t to move the locking member e into its operative position (as shown in Fig. 5) into engagement with the tooth c^2 during the initial heating of the thermostat, while permitting the thermostat to continue its expansion after the locking member has moved into its operative position, until the pawl r engages behind the tooth w under the action of the spring s as shown in Fig. 5 in broken lines, thereby restoring the positive driving connection. During the initial cooling of the thermostat, the pawl withdraws the locking member e positively out of engagement, the movement of the locking member being limited by the abutment stud q. Just prior to the locking member coming into contact with the abutment stud q the tail of the pawl r bears against a stud r^3 on the frame or baseplate which carries the parts and the pawl is tripped out of engagement with the tooth w, thereby allowing the thermostat to continue cooling without influencing the locking member e. The yielding connection provided by the spring s in Figs. 4 and 5 permits the lever or arm constituting the rocking member n to continue its movement under the action of the thermostat until the tail of the pawl moves out of contact with the pin r^3 and engages the bent or projection w under the action of the spring.

In all the constructional forms described, the movement of the locking member is limited in one direction by coming into contact with the gas tap or the member connected thereto with which it co-operates to retain the gas tap in its open position against the action of the automatic closing means, the adjustment of the parts being preferably such that when the thermostat is cold the locking member occupies a position with respect to the member with which it co-operates such that only a small movement of the locking member is necessary to bring it into its operative position during the initial heating of the thermostat. It is preferable however to provide a fixed abutment such as a pin q so as to provide a positive stop for the locking member. By this means the movement of the locking member is limited in both directions.

The relative movement between the locking member e and the lever n may be limited by suitable abutment means, for instance ribs or other projections provided on the edge of one of the said members and adapted to engage the edge of the other member. Preferably, however, abutments are provided on the lower end of the lever arm n which engage the pivot e' of the locking member or the boss which surrounds the pivot. These abutments in Fig. 7 are formed by a curved recess or notch in the end of the member n, the arrangement being similar to that shown in Fig. 3. This arrangement also provides for the contingency that the burner may become extinguished after the locking member e has come into action but before the pawl r has come into engagement with the bent w to effect positive disengagement, the abutment means at the end of the lever n providing a positive driving connection between the locking member and the arm n as the thermostat becomes cold, so that in the end position of the connecting rod t the locking member e is posi-

tively withdrawn, independently of the pawl r.

The connecting rod t is in two parts which are adjustable lengthwise with respect to one another and are held together by means of a screw t^4 passed through a slot in one of the parts, a pin or stud t^3 on the other part engaging in the said slot to maintain the parts in alignment. The connecting rod t is provided with a finger or projection t^5 which engages the tiltable pilot burner h and tilts it away from the thermostat when the connecting rod is moved to the left to engage the locking member e, the arrangement being such that the pilot burner is tilted away from the thermostat only as the latter approaches the limit of its movement after the locking member e has been engaged and is tilted again into its fully operative position during the initial movement of the thermostat when the flame of the pilot burner is extinguished. The pilot burner tube h is tilted towards the coil g by means of a spring y comprising a wire, one end of which is bent aside to engage the side of the upright member v to which the end g^2 of the thermostat is attached, the spring being looped around a stud v' and then extending in a more or less horizontal direction towards the burner tube h where the wire is provided with one or more coils v^2 and then extends upwardly to engage the tube h. In Fig. 5, the spring y has been omitted to show the construction of the universal mounting of the burner tube h which is provided with a ball end h' provided with a bore h^2 for establishing communication between the interior of the burner tube and the interior of a screwed nipple i' which communicates with a conduit in the bracket u leading to the gas tap, the said nipple at its upper edge forming a seating for the ball h' against which seating the ball is pressed by means of the cap i which is screwed on to the nipple i', a coil spring (not shown) being interposed between the top of the cap i and the upper surface of the ball so that the ball is pressed resiliently upon its seating. The burner tube h is constructed as an atmospheric burner having a gas nipple h^3 with air inlets adjacent thereto. The pilot burner tube in the constructional forms shown in Figs. 1 and 2 may also be constructed as atmospheric burners in a similar manner.

The burner which heats the thermostat is preferably provided with automatic ignition means, e. g. a frictional igniting device which is operated through the intermediary of a ratchet clutch device connected up to the gas tap or the means for actuating the gas tap. Referring to Fig. 6, a driving member **4** is fixed to the spindle a or the handle a' of the gas tap and is arranged to engage a tooth **5'** on a lever member **5** which is pivoted at **6** on a rocking member **7** which is pivoted on a stud **7'** which forms the bearing support of a friction wheel **8** which coacts with a flint contained in a flint holder **9**. The lever member **5** is provided with a lug **10** which is engaged by one end of a helical spring **11**, the other end of which is fixed to the upright member v by means of a screw **12**, the spring **11** being provided with a loop which engages around the shank of the screw. By this means, the free end of the lever member **5** is caused to bear against the boss **13** of the gas tap, the rocking member **7** being provided with a projection 7^2 which engages a stud **14** on the frame which carries the parts so as to limit the rearward movement of the member **7** under the action of the spring **11**. When the gas tap is turned clockwise to open it, the driver **4** engages the tooth **5'**, thereby turning the rocking member clockwise against the action of the spring **11**, the free end of the lever **5** riding on a fixed projection u' and bringing the tooth **5'** out of engagement with the driver **4** whereupon the lever and rocking member return to their initial position shown in Fig. 6. The rocking member **7** actuates the friction wheel **8** through the intermediary of a silent ratchet clutch comprising a spring coil **15** which grips the boss of the friction wheel with a certain amount of friction but which is capable of slipping when the outer end **15'** of the spring coil is turned in the direction which tends to unwind the coil but which grips the boss of the friction wheel tightly when the end **15'** is turned in the opposite direction, thereby providing a driving connection between the rocking member **7** and the friction wheel. The coil is wound in such a manner that the driving connection is produced only when the rocking member **7** is returning to its initial position under the action of the spring **11**. The end **15'** of the coil **15** passes through a hole **16** in the rocking member **7**. The flint holder **9** is provided with a forked end the limbs **9'** of which straddle the stud d' for the clock spring on the other side of the supporting frame, the flint holder being secured in position by means of the stud **7'** which is screwed into the frame and projects on the other side thereof to enable the flint holder to be passed over it by means of the hole 9^2, the flint holder being clamped in position by means of a nut screwed on to the projecting end of the stud **7'**, the tubular part 9^3 which receives the flint projecting on the opposite side above the friction wheel. The flint is pressed into contact with the friction wheel by means of a lever **17** mounted on a fixed pivot **18** and pressed down on the flint by means of a spring **18** the lower end of which is passed through an eye provided in a stud **19** screwed into the frame which carries the parts. The tube **9** is provided with a guide slot for the lever **17** and with a notch in which the lever can rest when it is desired to change the flint or for any other purpose. By means of the ignition device described, the flint is only acted on during the return motion of the lever **5** when the wheel **8** is turned rapidly under the action of the spring **11**, so that the production of a good supply of sparks is ensured.

By operating the igniting means from the spindle or handle of the gas tap, which is movable independently of the automatic closing means, it is unnecessary to wait until the part which coacts with the locking member is released by the latter before the gas can be relighted, so that on the burner or pilot burner becoming extinguished the igniting means can be operated immediately by the handle of the gas tap without waiting for the automatic closing means to come into action.

It is preferable to provide parallel guiding means for the pilot burner in the construction shown in Figs. 4 to 9, comprising, as shown in Fig. 5, a plate l' having a slot for guiding the pilot burner and secured to the upright v by means of a stud and nut l^2. By slackening the nut l^2 the plate l' can be tilted at different angles to obtain the required line of travel of the pilot burner.

In each of the constructional forms described the whole arrangement may be enclosed in a cowl or casing having a door to permit access to the

igniting device for the purpose of changing the flints.

The base member 1 on which the parts are mounted may be removable from the gas tap, so that the whole of the mechanism may be assembled on the base member as a unit which can be mounted on and removed from the gas tap without dismantling.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. The combination of a gas burner, a gas tap for controlling the supply of gas thereto, automatic closing means connected to the gas tap, manual actuating means for the gas tap to enable the tap to be opened against the action of said closing means, a thermostat device located in the heating zone of said burner, a movable locking member for retaining the gas tap in the open position and abutment means for limiting the withdrawal movement of the locking member to the amount required to bring it out of its operative position, with actuating means connected to said thermostat device for moving the locking member into and withdrawing it from its operative position, said actuating means including a yielding driving connection for moving the locking member into its operative position during the initial heating of the thermostat device, said driving connection permitting free movement of the thermostat device during the continued heating thereof, and a further driving connection comprising a movable driving member arranged to engage the locking member positively during the continued heating of the thermostat device subsequent to the locking member reaching its operative position, so as to be capable of withdrawing the locking member from its operative position during the initial cooling of the thermostat device, and disengaging means arranged to disengage said driving member during the subsequent cooling of the thermostat device, so as to permit free motion of the thermostat device during the continued cooling thereof.

2. The combination of a gas burner, a gas tap for controlling the supply of gas thereto, automatic closing means connected to the gas tap, manual actuating means for the gas tap to enable the tap to be opened against the action of said closing means, a thermostat device located in the heating zone of said burner, a movable locking member for retaining the gas tap in the open position and abutment means for limiting the withdrawal movement of the locking member to the amount required to bring it out of its operative position, with actuating means connected to said thermostat device for moving the locking member into and withdrawing it from its operative position, said actuating means including a lever pivoted on the locking member and operatively connected to the thermostat device, a yielding driving connection between said lever and locking member for moving the locking member into its operative position during the initial heating of the thermostat device, said yielding driving connection permitting the lever to move relatively to the locking member during the continued heating of the thermostat device, a pawl pivoted on said lever and arranged to engage the locking member positively during the motion of the lever relatively to the locking member after the locking member has moved into its operative position, so as to be capable of withdrawing the locking member from its operative position during the initial cooling of the thermostat device, and an abutment arranged in the path of said pawl so as to withdraw the pawl from the locking member during the continued cooling of the thermostat subsequent to the withdrawal of the locking member.

3. The combination as set forth in claim 2, in which the yielding driving connection comprises a spring connected to the locking member and arranged to bear against the pawl so as to urge the pawl into engagement with the locking member.

4. The combination of a gas tap for controlling the supply of gas to a gas burner, automatic closing means connected to the gas tap, manual actuating means for the gas tap to enable the tap to be opened against the action of said closing means, a pilot burner in communication with said gas tap, a thermostat device located in the heating zone of said pilot burner, said pilot burner being displaceable towards and away from said thermostat device, a movable locking member for retaining the gas tap in the open position and actuating means connected to said thermostat device for moving the locking member into and withdrawing it from its operative position with actuating means connected to the thermostat device and the pilot burner and arranged to move the pilot burner away from the thermostat device as the latter approaches the limit of its deflection due to the heating thereof and to move the burner towards the thermostat device as the latter approaches the limit of its return movement on cooling.

5. The combination of a gas tap for controlling the supply of gas to a gas burner, automatic closing means connected to the gas tap, manual actuating means for the gas tap to enable the tap to be opened against the action of said closing means, a pilot burner in communication with said gas tap, a thermostat device located in the heating zone of said pilot burner, said pilot burner being tiltable towards and away from the thermostat device, actuating means comprising a coil spring connected at one end to the pilot burner and at the other end to the movable part of the thermostat device, the tilting axis of the pilot burner being located with respect to the point of connection of said spring to the movable part of the thermostat device such that said point of connection moves past the tilting axis towards the end of the expansive movement of the thermostat device so as to move the pilot burner away from the thermostat device towards the end of said expansive movement, a movable locking member for retaining the gas tap in the open position and actuating means for said locking member connected to the thermostat device for moving the locking member into and out of its operative position.

6. The combination as set forth in claim 4, with a universal mounting for the pilot burner and adjustable parallel guiding means for the pilot burner, said parallel guiding means having a slot therein for the reception of the pilot burner, so as to enable the pilot burner to be adjusted to the required line of travel.

7. The combination of a gas burner, a gas tap for controlling the supply of gas thereto, automatic closing means connected to the gas tap, manual actuating means for the gas tap to enable the tap to be opened against the action of said closing means, a thermostat device located in the heating zone of said burner, a movable locking member for retaining the gas tap

in the open position and abutment means for limiting the withdrawal movement of the locking member to the amount required to bring it out of its operative position, with actuating means connected to said thermostat device for moving the locking member into and withdrawing it from its operative position, said actuating means comprising a lever pivoted on the locking member and operatively connected to the thermostat device, a pawl pivoted on said lever, said pawl having a stud thereon, a stud on the locking member, a coil spring encircling said latter stud and having one end in engagement with the locking member and the other end bearing against the stud on the pawl, so as to form a yielding driving connection between said lever and locking member for moving the locking member into its operative position during the initial heating of the thermostat device, said yielding driving connection permitting the lever to move relatively to the locking member during the continued expansion of the thermostat device, said pawl being arranged to engage the locking member during the motion of the lever relatively to the locking member, so as to withdraw the locking member positively from its operative position during the initial cooling of the thermostat device, abutment means for limiting the withdrawal movement of the locking member to the amount required to bring it out of its operative position, a tail on said pawl and a fixed abutment arranged in the path of said tail, so as to trip the pawl out of engagement with the locking member during the continued cooling of the thermostat device.

8. The combination as set forth in claim 2, with a boss on the pawl, the pivotal axis of the pawl passing through said boss, the end of the lever adjacent said boss having abutments arranged to extend on either side of said boss so as to limit the relative motion between the lever and the locking member, so as to enable the thermostat device to withdraw the locking member positively from its operative position.

9. The combination of a gas tap for controlling the supply of gas to a gas burner, automatic closing means connected to the gas tap, manual actuating means for the gas tap to enable the tap to be opened against the action of said closing means, a pilot burner in communication with said gas tap, a thermostat device located in the heating zone of said pilot burner, said pilot burner being displaceable towards and away from said thermostat device, a movable locking member for retaining the gas tap in the open position and abutment means for limiting the withdrawal movement of the locking member to the amount required to bring it out of its operative position, with actuating means for moving the locking member into and withdrawing it from its operative position, said actuating means including a connecting rod, a yielding driving connection between the connecting rod and the locking member for moving the locking member into its operative position during the initial heating of the thermostat device, said yielding driving connection permitting free movement of the thermostat device during the continued heating thereof, and a further driving connection comprising a movable driving member interposed between the connecting rod and the locking member and arranged to engage the locking member positively during the continued heating of the thermostat device subsequent to the locking member reaching its operative position so as to withdraw the locking member from its operative position during the initial cooling of the thermostat device, disengaging means arranged to disengage said driving member during the subsequent cooling of the thermostat device, and means for displacing the pilot burner, comprising a spring arranged to urge the pilot burner towards the thermostat device, and a finger on the connecting rod located to engage and move the pilot burner away from the thermostat device against the action of said spring as the thermostat device approaches the limit of its deflection during the heating thereof and to allow the burner to return under the action of the spring during the initial cooling of the thermostat device.

10. The combination of a gas burner, a gas tap for controlling the supply of gas thereto, automatic closing means connected to the gas tap, manual actuating means for the gas tap to enable the tap to be opened against the action of said closing means, a thermostat device located in the heating zone of said burner, a movable locking member for retaining the gas tap on the open position and abutment means for limiting the withdrawal movement of the locking member to the amount required to bring it out of its operative position, with actuating mechanism connected to said thermostat device and to said locking member for moving the locking member into and withdrawing it out of its operative position under the control of the thermostat device, said actuating means and locking member having teeth arranged for mutual driving engagement at least during the withdrawal of the locking member from its operative position, for ensuring the withdrawal of the locking member, and the actuating mechanism being movable relatively to the locking member during the continued heating and cooling of the thermostat device subsequently to the movement of the locking member into its operative and inoperative positions, respectively.

11. The combination of a gas burner, a gas tap for controlling the supply of gas thereto, automatic closing means connected to the gas tap, manual actuating means for the gas tap to enable the tap to be opened against the action of said closing means, a thermostat device located in the heating zone of said burner, a movable locking member for retaining the gas tap in the open position and abutment means for limiting the withdrawal movement of the locking member to the amount required to bring it out of its operative position, with actuating mechanism connected to said thermostat device and to said locking member for moving the locking member into and withdrawing it out of its operative position under the control of the thermostat device, said actuating means including a yielding driving connection to enable the thermostat device to continue its expansion and contraction after the locking member has moved into its operative and inoperative positions, respectively, and driving means arranged to effect a positive driving connection between the locking member and its actuating means as the thermostat device approaches its fully contracted state, so as to ensure positive withdrawal of the locking member under all circumstances.

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