

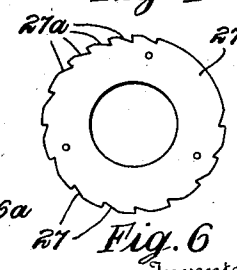
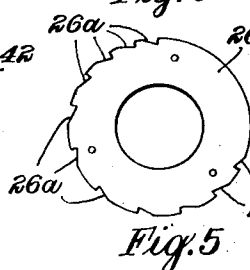
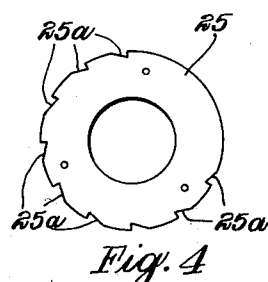
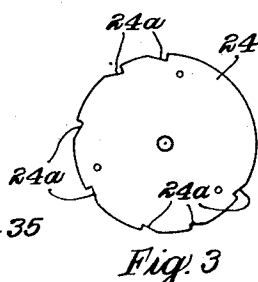
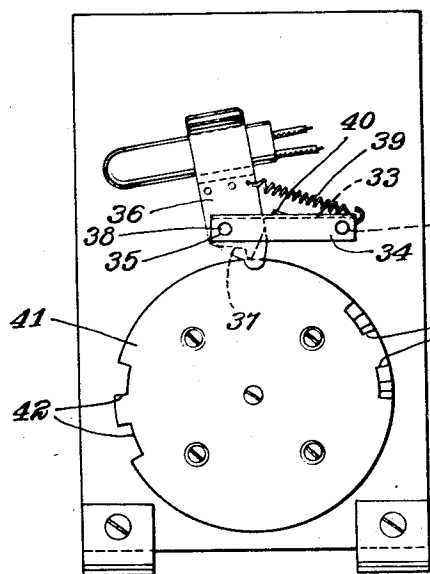
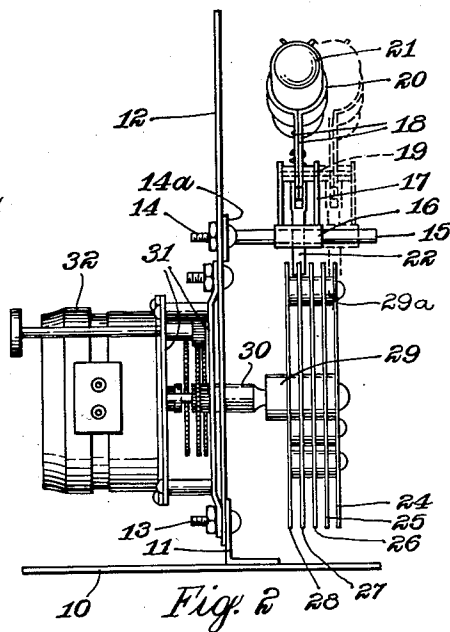
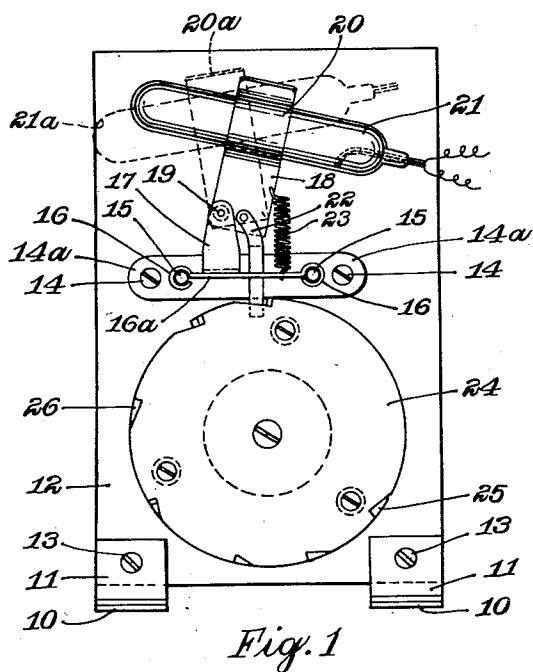
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CONTROL

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CONTROL

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3 Claims. (Cl. 200—38)

My invention relates to an automatic control, and more particularly to an improved control device for a furnace stoker to effect its heating operation irrespective of outside or inside thermostatic controls.

An object of my invention is to provide a direct automatic stoker control for steam heating systems subject to external variable conditions.

Another object of my invention is to provide an independent automatic control which requires only a mechanical adjustment for varying the on and off heating periods of an automatic stoker in a steam heating system.

A further object of my invention is to provide a steam boiler stoker control which operates independently of thermostatic furnace temperature controls.

A further object of my invention is to provide a time control switch for actuating an automatic circuit in accordance with a variable selective adjustment made with respect to time and/or temperature conditions.

Other objects of my improved control will be disclosed and apparent in the following description of the attached drawing wherein:

Figure 1 is a front plan view of my improved control.

Figure 2 is a side plan view of the control shown in Figure 1.

Figures 3, 4, 5 and 6 are front plan views of my control discs for the variable switch of Figure 1 and Figure 2.

Figure 7 is a modified adjustable variable switch showing the use of modified control discs.

In the drawing there is shown in Figure 1, base supports 10 upon which right angle legs 11 secure standard 12 in an upright or vertical position by bolt means 13. The standard 12 supports on its front face, by bolt means 14, a plate 14a from which carrier arms 15 perpendicularly project. Encircling the carrier arms 15 are sliding bands 16 supporting between them a carrying plate 16a upon which is mounted a support 17 for switch carrying arms 18. The base end of arms 18 is attached to the support 17 at pivot point 19 and these arms 18 are comprised of spring steel, or the like, with loops 20 for clamping a mercury switch 21, or the like, therebetween. The mercury switch 21 is of standard manufacture and operates in an electric circuit with an automatic stoker or other mechanism when actuated in accordance with my disclosure to complete or disconnect a circuit as provided by the timed relation hereinafter described.

At the base of arms 18 there is provided a pivoted elongated rider 22 which slideably extends through carrying plate 16. The arms being pivoted at their base at point 19 tend to tip forward by reason of tension spring 23 fastened at one end to arms 18 and at its opposite end to carrying plate 16 constantly exerting a forward pulling pressure, thereby causing the rider 22 to bear against the outer periphery of the ratchet disc 24 which is one of a plurality or series as hereinafter described. The rider 22 is adjusted thereon by tipping the arms and mercury switch 21 backward (as shown by dotted lines 20a and 21a) against the tension of spring 23 and sliding the plate 16 with its related parts (shown by dotted lines 16a in Figure 2) to one or the other of a plurality of ratchet discs as may be desired by the operator.

In Figure 2 the ratchet discs 24, 25, 26, 27 and 28 are shown mounted on spindle 29 and reinforced by spacers 29a and adapted to be rotated by shaft 30 which is turned by any suitable and conventional synchronous clock mechanism. The synchronous clock mechanism, preferably shown, is attached to the backside of standard 12 by suitable conventional means and comprises generally a standard gear housing 31 and standard electric clock 32.

The discs mounted on spindle 29 of Figure 2 illustratively shown in Figures 3, 4, 5 and 6 and indicated as 24, 25, 26 and 27 are provided with outer peripheries against which the rider 22 of Figure 1 or rider and spacer 37 shown in Figure 7, hereinafter described, is adapted to ride and maintain the switch control in operative or inoperative position when aligned thereon according to selective adjustment or positioning of the switch carrying plate 16. These discs are provided with timed actuating means, as, for example, ratchets or indentations 24a, 25a, 26a and 27a respectively which cause the rider 22, as shown in Figure 1, to move thereinto and cause the mercury switch 21, supported by carrying arms 20, as shown in Figure 1, or switch carrying arms 36, as shown in Figure 2, to tip forward by reason of the tension means as indicated into an operative position for passing an electric current therethrough.

The discs 24, 25, 26 and 27, including the disc 28 not specifically illustrated, are provided with spaced ratchets or indentations at different timed intervals corresponding with the desired on and off heating periods of an automatic stoker in accordance with the determination of the operator

under varied heating requirements. For example, in Figure 3 there is shown a disc 24 suitable for use in cool fall or spring weather where there is need for pressure in a steam boiler system only occasionally throughout the day after the first or early morning heating which takes place without the attendance of an operator and irrespective of thermostatic control from external or internal temperature conditions. The disc, as shown and for purposes of illustration, is adapted to revolve only once in every 24 hours with an on period occurring at 5:00 a. m., for example, and lasting for one-half hour. Thereafter other one-half hour periods will occur, at 7:00 a. m., 10:00 a. m., 1:00 p. m., 4:00 p. m., 6:00 p. m. and the last at 8:00 p. m. which periods of heating appear sufficient for conditions as indicated. However, when more extreme or colder weather, for example 15° to 20° below zero occurs the above heating periods will be inadequate whereupon the operator adjusts the variable control by lifting the rider, as above indicated, and slides the switch mechanism to a disc which operates the stoker at an earlier hour in the morning and many more times throughout the day. For example, as shown in Figure 6, the starting one-half hour heating period may be at 4:00 a. m. with other heating periods at 5:00 a. m., 6:00 a. m., 7:00 a. m., 8:00 a. m., 9:30 a. m., 11:00 a. m. etc., and continues at regulated periods throughout the day until the final heating period at night at which time the disc keeps the switch in an off position until the disc completes its circuit to start again at the desired time in the early morning hours.

The discs in Figure 4 and Figure 5 are similar in character to the discs in Figure 3 and Figure 6 except the ratchets or indentations are positioned for conditions intermediate of the two extremes used for illustration and represent winter conditions which require more heat than cool fall weather or less heat than extreme low temperatures. The disc 28 not illustrated, is similar to the disc 27 in that it is preferably prepared for even colder weather, for example, temperatures as low as 30° and 40° below zero and the timing intervals are spaced to provide more heating intervals throughout the day.

The modified control and disc means shown in Figure 7 discloses a metal plate 33 with its sides 34 bent at right angles to the top and holes 35 drilled in the ends for slidably mounting the plate on carrier arms 15 (shown in Figure 1 and Figure 2). Projecting through one end of the plate 33 are mercury switch carrying arms 36 separated by a spacer and rider means 37 and adapted to be pivotably secured and retained on one of the carrier arms 15 (shown in Figure 1 and Figure 2) at pivot point 38.

The tension spring 39 is provided to exert constant pressure on mercury switch carrying arms 36 by attachment at one end to plate 33 and at its opposite end to the arms 35 in order to maintain the switch in constant operative position against the abutment 40 except when forced to an off or inoperative position as hereinafter described.

The switch carrying arms 36 and rider 37 of Figure 7 are shown aligned on the outer periphery of the first of a series of six discs arranged in substantially the same manner as disclosed in Figure 2. The outer disc 41 is provided with notches 42 which actuate the switch means to afford an on position for substantially one-half hour periods at 5:00 and 7:00 a. m. and 5:00 and 7:00 p. m. for brief morning and evening heating

periods. The disc immediately back of disc 41 has notches in its outer periphery to afford an on position for substantially one-half hour periods at 5:00, 7:00 and 10:00 a. m. and 1:00, 4:00, 6:00 and 8:00 p. m. for a greater number of heating periods throughout the day in moderately cold weather. The next disc or No. 3 in the series affords an on heating period at 5:00, 7:00, 9:30 and 12:00 a. m. and 2:30, 4:30, 6:30 and 8:30 p. m. The next disc or No. 4 in series provides an on period every two hours from 5:00 a. m. until 10:00 p. m. The next disc or No. 5 in series provides an on period every one and one-half hours starting at 4:45 a. m. until 10:00 p. m. The last disc or No. 6 is provided for extremely cold weather and affords an on period approximately every one-half hour between 4:15 a. m. until 11:00 p. m. In general it has been found that half-hour heating periods will take care of all normal weather changes although further changes may be made in the heating periods or timing relations as are necessary to vary the on and off periods as desired.

While I have shown in the discs heretofore illustrated a ratchet or indentation 24a, 25a, 26a and 27a with its one edge cut perpendicular to the outer periphery and its other edge cut at a tangent thereto, I may, as provided in the outer disc 41 shown in Figure 7, use a series of discs with both sides of the ratchets or indentations 42 cut substantially at right angles to the periphery to obtain a sharp break at a desired on and off period. In this illustration it is to be understood that a series of discs similar to those illustrated may be used and each disc provided with a timed on and off period substantially as herein indicated.

In operation, this adjustable switch mechanism is made to function independently of any thermostatic or temperature control normally used to safeguard the system and in normal operation is used to produce that amount of heat in a heating system over and above the normal temperature at which the boiler is kept for the water supply and not the heating system by the usual thermostatic controls, although in application it may be used in conjunction with a master control by providing suitable attachment therewith.

For example, an aquastat control will maintain the normal hot water supply for household purposes and keep the boiler, for example, in a steam heating system, from 145° F. to 185° F. while the control herein disclosed operates to raise the temperature of the boiler at regular predetermined intervals throughout the day and/or night to supply additional heat to the heating system in accordance with required conditions.

While I prefer my improvement to be used in conjunction with a heating system, my switch mechanism has been found useful for other purposes where there is need for control under variable conditions, other than temperature as, for example, where an on or off circuit control can be varied and adjusted with respect to time for lighting effects by providing a series of discs with ratches or notches to operate the switch in accordance with variations as to periods of darkness or daylight, or control of mechanical and electrical mechanism and the like, and it will be understood that such uses and modifications incidental thereto may be made without departing from the spirit of my invention.

What I claim is:

1. An automatic switch control comprising a

timing means including a rotatable shaft, a plurality of individual adjustable disks on said shaft, a pair of spaced carrier arms mounted in parallel relation to said shaft and spaced radially therefrom a distance greater than the radius of the disks, a carrier plate longitudinally slidable on said arms, a switch assembly mounted on said plate and including a switch actuating arm selectively engageable by movement of the carrier plate with the periphery of any one of said discs.

2. An automatic switch assembly including a horizontal base, a vertical standard supported from said base, a timing means mounted on one face of said standard and including a horizontal rotatable shaft extending through said standard, a plurality of individual adjustable disks on said shaft, a pair of spaced carrier arms mounted in parallel relation to said shaft and spaced radially therefrom a distance greater than the radius of the disks, a carrier plate longitudinally slidable on said arms, a switch assembly mounted

on said plate and including a switch actuating arm selectively engageable by movement of the carrier plate with the periphery of any one of said discs.

5 3. An automatic switch assembly including a horizontal base, a vertical standard supported from said base, a timing means mounted on one face of said standard and including a horizontal rotatable shaft extending through said standard, 10 a plurality of spaced individually notched adjustable actuating disks on said shaft on the opposite side of the standard from said timing means, a pair of spaced carrier arms supported from said standard in parallelism with said shaft 15 and extending over said disks, a carrier plate longitudinally slidable on said arms, a switch assembly mounted on said plate and including a switch actuating arm selectively engageable by movement of the carrier plate with the periphery 20 of any one of said discs.

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