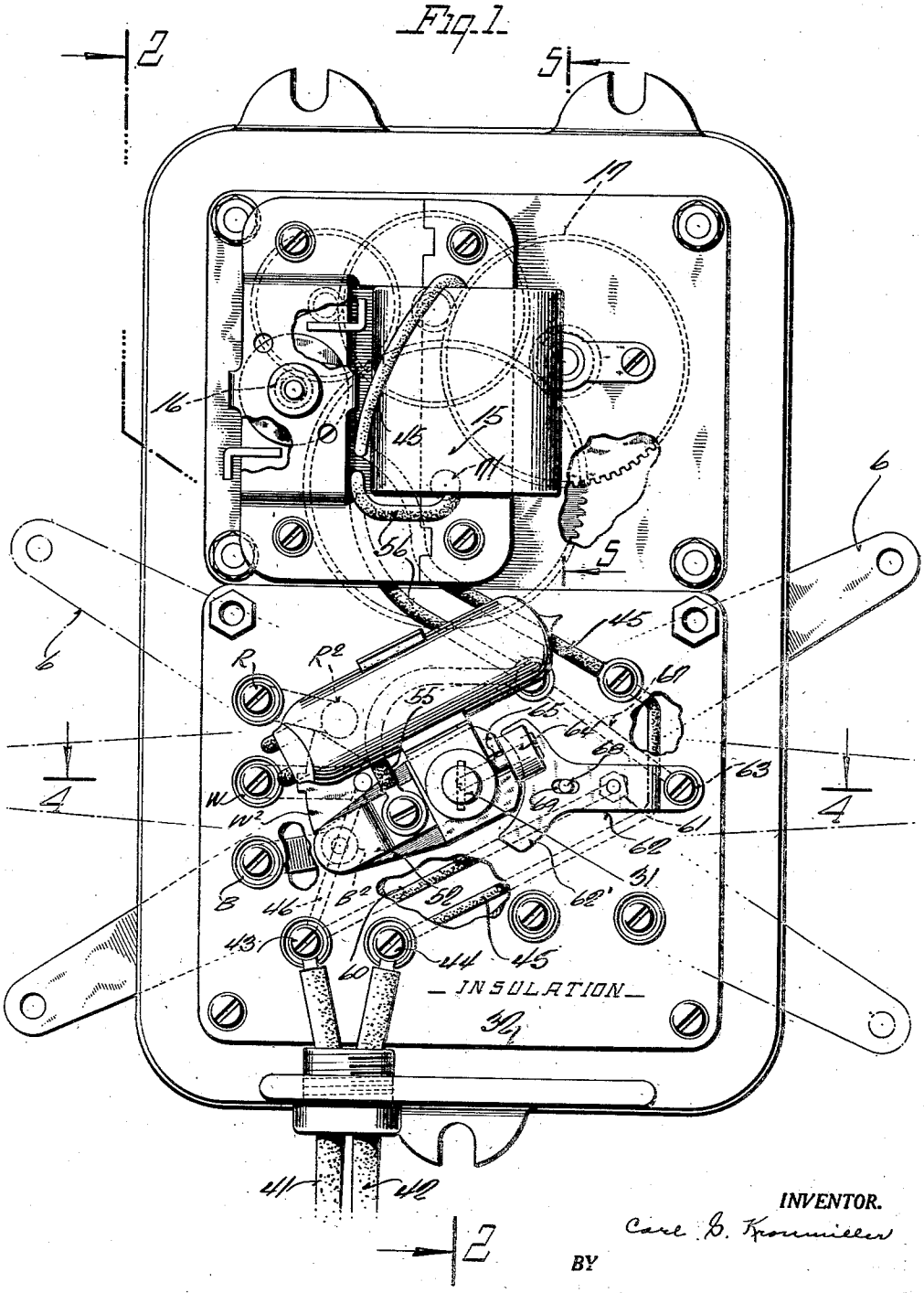
Sept. 12, 1933. C. G. KRONMILLER 1,926,680

DAMPER MOTOR

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Fig. 1.



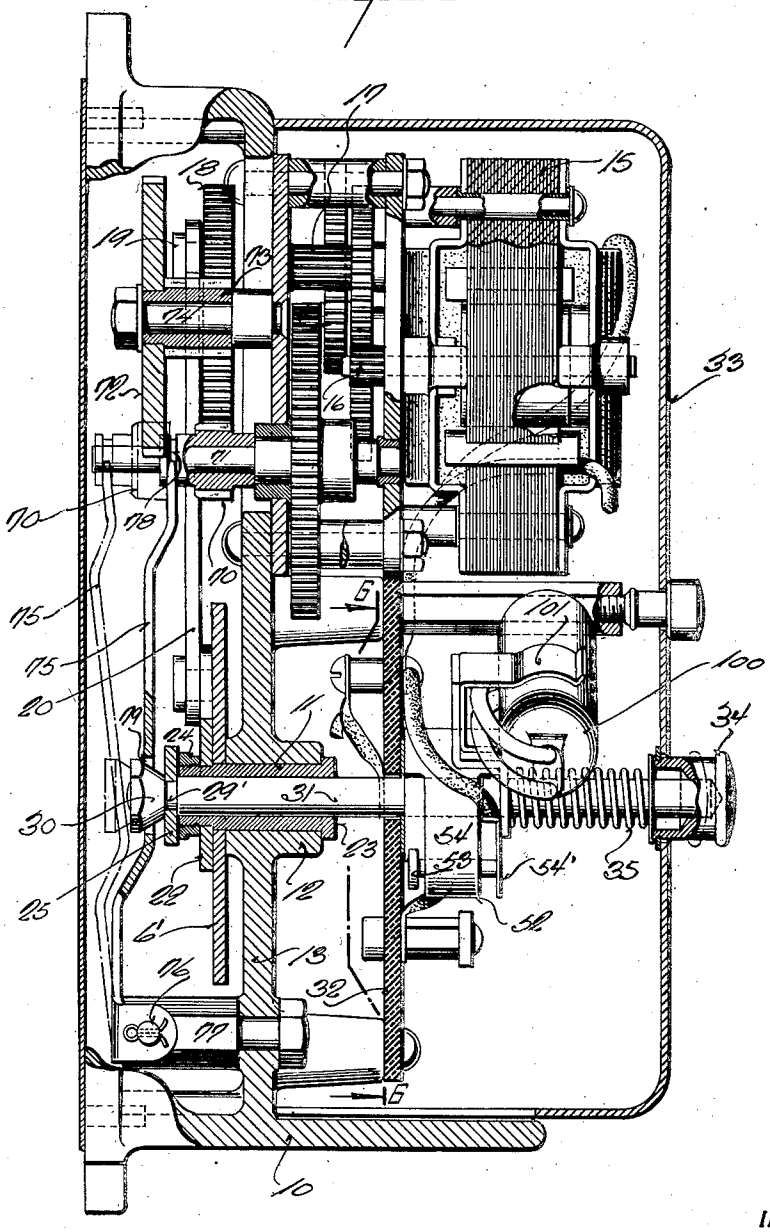
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DAMPER MOTOR

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Fig. 2.



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DAMPER MOTOR

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Fig. 3.

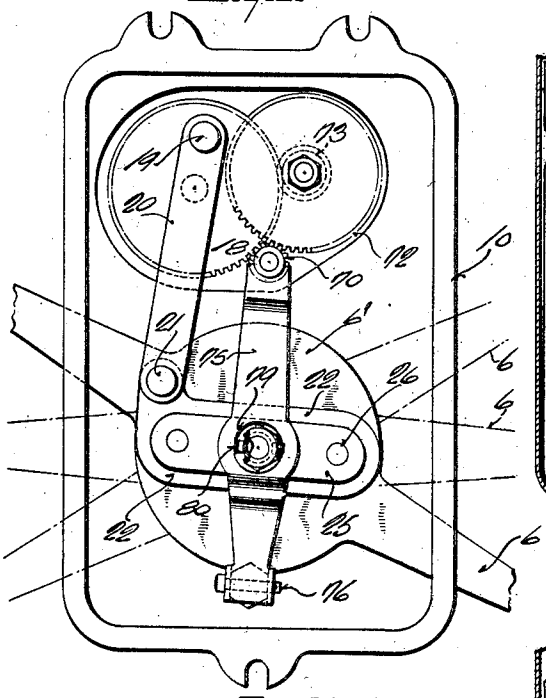


Fig. 6.

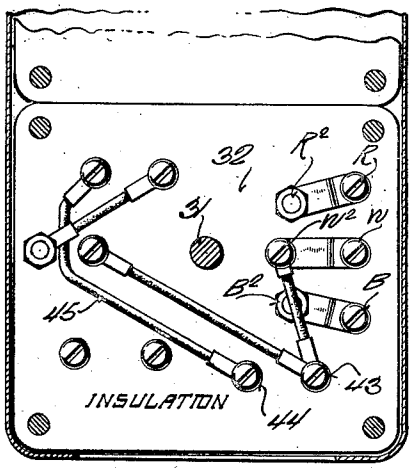


Fig. 11.

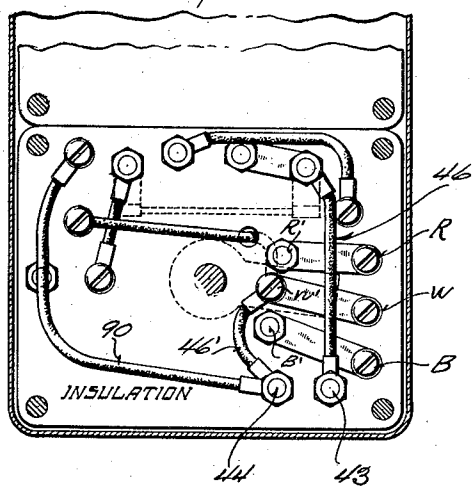
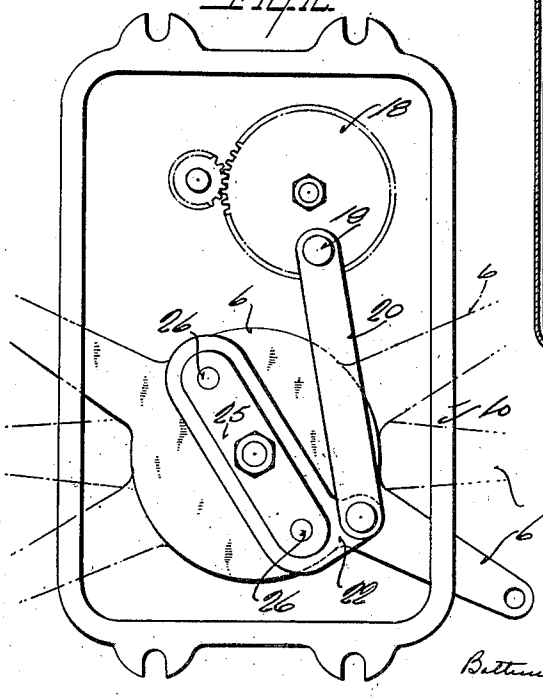


Fig. 12.



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Sept. 12, 1933. C. G. KRONMILLER 1,926,680

DAMPER MOTOR

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Fig. 4

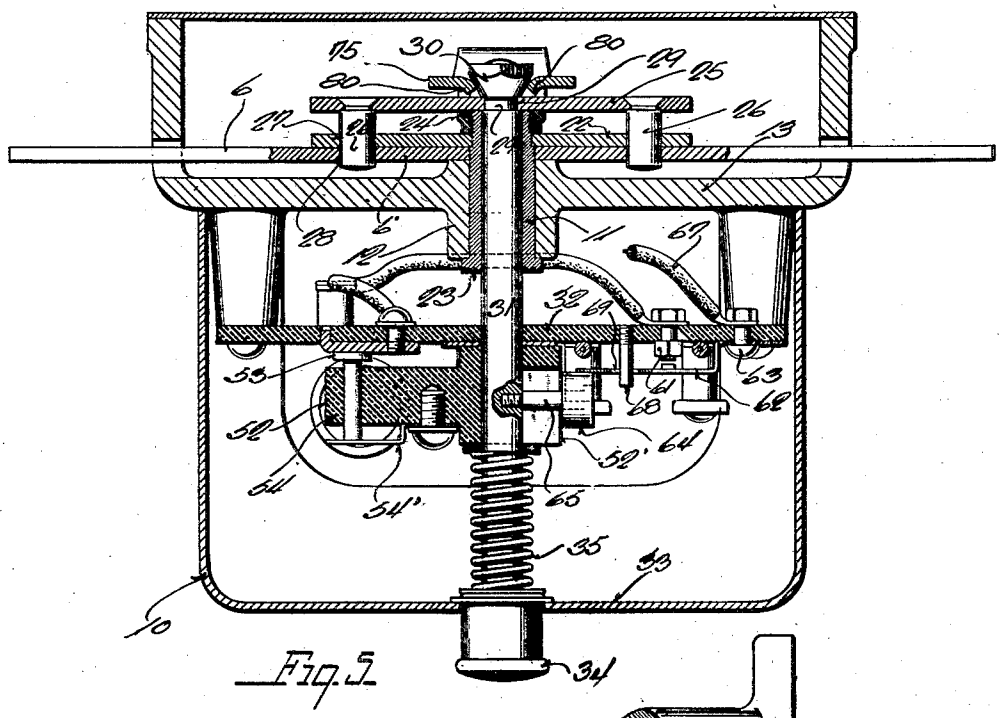
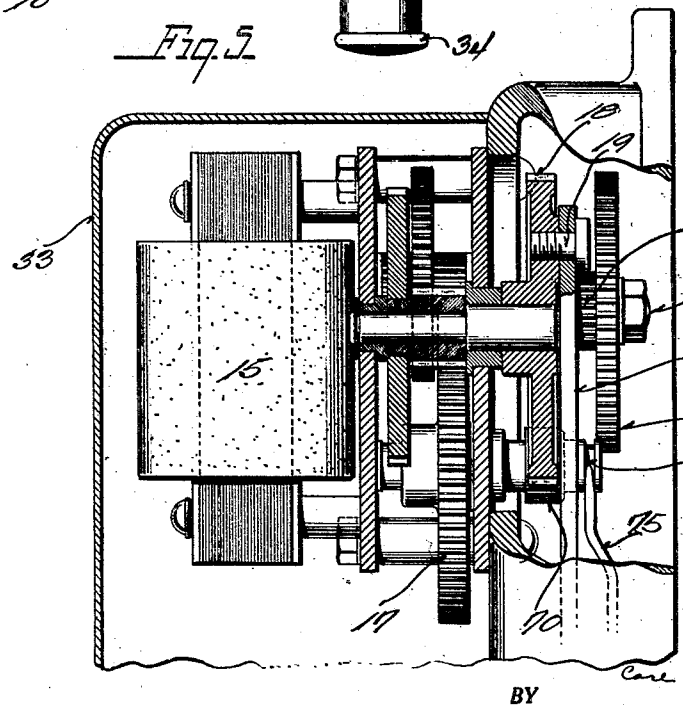


Fig. 5



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Sept. 12, 1933. C. G. KRONMILLER 1,926,680

DAMPER MOTOR

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Fig. 7

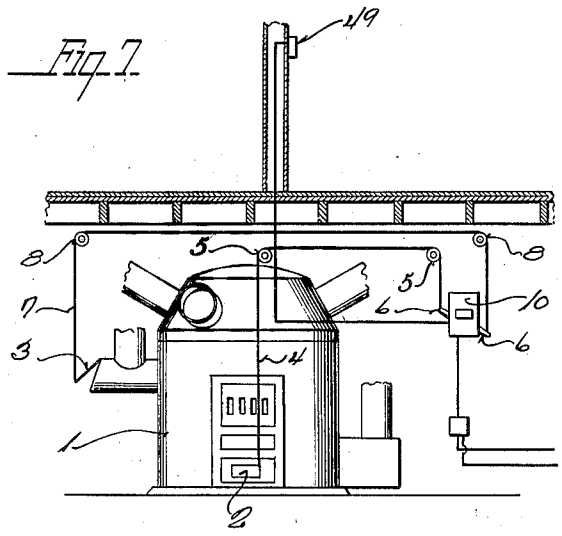


Fig. 8

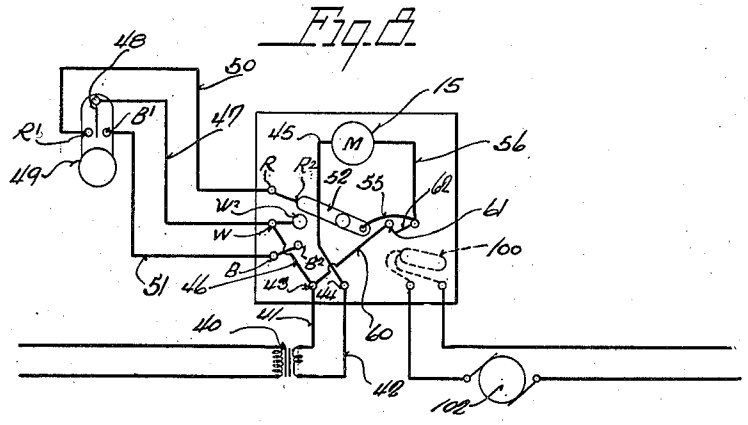
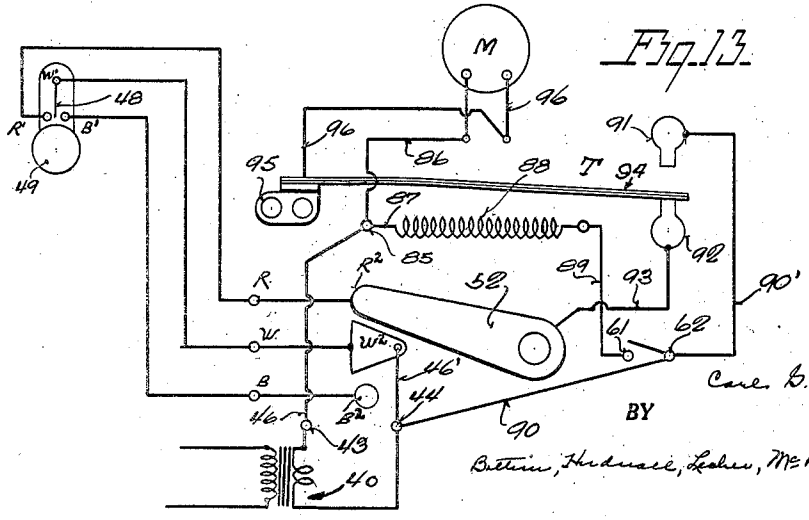


Fig. 13



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DAMPER MOTOR

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Fig. 10

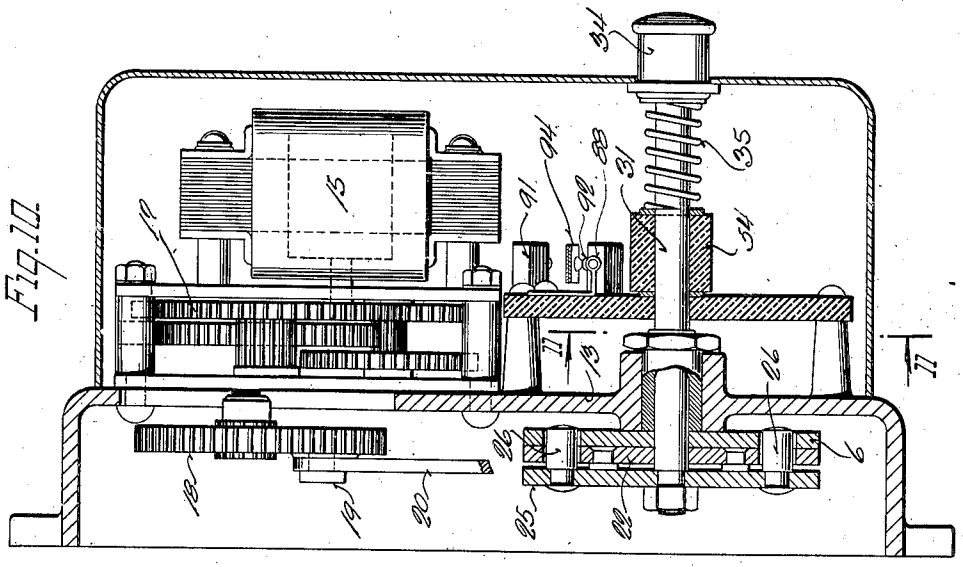
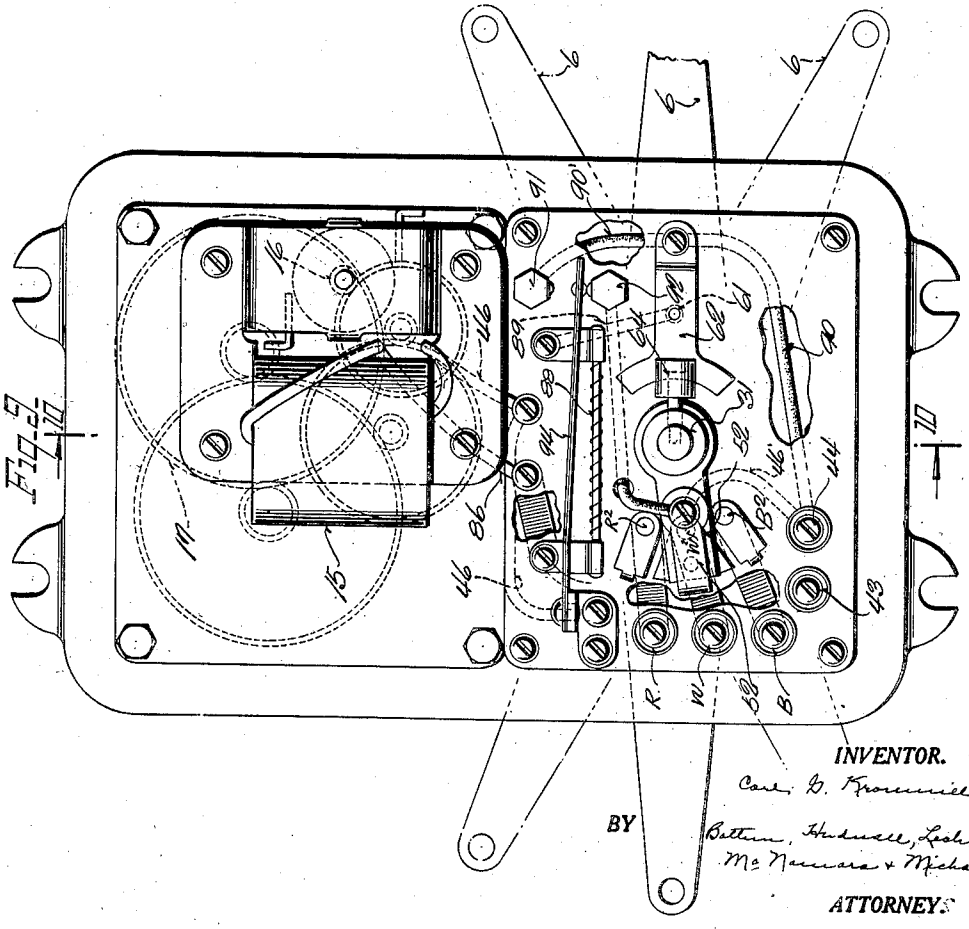


Fig. 9



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Patented Sept. 12, 1933 1,926,680

UNITED STATES PATENT OFFICE

1,926,680

DAMPER MOTOR

Carl G. Kronmiller, Elkhart, Ind., assignor to Minneapolis-Honeywell Regulator Company, Minneapolis, Minn., a corporation of Delaware

Application March 25, 1931. Serial No. 525,170

12 Claims. (Cl. 236—16)

This invention relates generally to mechanism for regulating the operation of dampers of heating plants and is especially designed and adapted for use in regulating the check and direct draft dampers on domestic coal fired heating plants. One of the principal objects of the invention is to provide a control of this character which is simple, compact and durable in construction, reliable and effective in operation, and adapted to be easily manufactured and installed at a moderate cost. The mechanism is equally adaptable for hot water, steam, vapor or warm air heating systems.

Another object of the invention resides in the provision of a control mechanism or system of this character which is adaptable to stoking in that during the stoking period the draft and check doors or dampers may be closed to prevent smoke from blowing out through the fire door and this without impairing the capacity of the system to exercise its control over the dampers following the stoking.

In one embodiment of the present invention the direct and check draft dampers are connected by cables, chains or other suitable motion transmission means to an operating lever supported for rocking movement and acting when tipped or rocked in one direction to close the direct draft and open the check draft, when tipped in the other direction to open the direct draft and close the check draft and when disposed intermediate its two extreme angled or tipped positions to close both the direct and the check draft dampers. The operating lever is actuated from an electric motor which may be an induction motor, the induction motor driving reduction gearing which acts through a crank pin, link and clutch to oscillate the operating lever. The crank pin and link arrangement is such that successive operations of the motor in the same direction reversely rock or tip the lever.

The clutch incorporated in the motion transmission train between the motor and the lever is manually operable and makes it convenient to disconnect the lever temporarily from its actuating mechanism and manually shift the lever to its neutral position in which both dampers are closed. This is especially desirable when stoking. Furthermore, the clutch is of such construction and is so organized in the motion transmission train that it is automatically re-engaged following the stoking period, and this automatic re-engagement may be made to occur upon subsequent change of position of the room thermostat or upon the lapse of a predetermined stoking period.

The operation of the electric motor is regulated by the conjoint action of a room thermostat and an automatic cycle-maintaining switch where re-engagement of the clutch following its throwout for stoking depends solely on a change of position of the room thermostat. Where automatic clutch re-engagement is to be had at the expiration of a predetermined stoking period, a third switch is incorporated in the motor controlling circuit with the room thermostat and the cycle-maintaining switch. The third switch is controlled by the clutch, the third switch being automatically closed when the clutch is disengaged and being automatically open when the clutch is engaged.

The cycle-maintaining switch prevents any possibility of incomplete cycling. In other words, once the motor is started under the control of the room thermostat, the cycle-maintaining switch functions to maintain the circuit complete independent of any changes in the position of the room thermostat until the complete cycle has been carried out and the position of the dampers has been completely changed or reversed.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part of this specification, and in which:

Figure 1 is a view in front elevation showing a control unit embodying the present invention, the cover being removed and parts being broken away for the sake of illustration;

Figure 2 is a sectional view taken in the plane of line 2—2 of Figure 1;

Figure 3 is a view of the control unit in rear elevation, parts being broken away and shown in section and the rear cover plate being removed for the sake of illustration;

Figure 4 is a view in horizontal section taken on line 4—4 of Figure 1;

Figure 5 is a view in vertical section taken on line 5—5 of Figure 1;

Figure 6 is a view in section taken on line 6—6 of Figure 2;

Figure 7 is a diagrammatic view showing the system installed on one type of furnace;

Figure 8 is a wiring diagram showing how the switches are electrically connected with each other and with the motor in one embodiment of the invention;

Figure 9 is a view in front elevation showing a

modified form of the invention, the front cover plate being removed;

Figure 10 is a view in section taken on line 10—10 of Figure 9;

Figure 11 is a fragmentary sectional view taken on line 11—11 of Figure 10;

Figure 12 is a view in rear elevation of the device shown in Figures 9, 10, and 11; and

Figure 13 is a wiring diagram of the form of the invention shown in Figures 10 to 12.

Referring to Figure 7, the numeral 1 designates generally a furnace having a direct draft damper 2 and a check draft damper 3. A cable 4 connects at one end with the direct draft damper 2 and after passing over guide pulleys 5 is secured to one end of an operating lever designated generally at 6. Similarly, a cable 7 has one end connected to the check draft damper 3 and after passing over pulleys 8 is connected to the opposite end of the lever 6 from that to which the cable 4 connects. The ends of the operating lever 6 project through and beyond the slots in a housing designated generally at 10. The central portion of the lever 6 is enlarged as at 6' (see Figure 3), and is fulcrumed or supported for rocking movement on a bushing 11 fitted and held in a bearing 12 formed on an internal wall or partition 13 of the casing 10 (see Figure 2).

The power for oscillating the operating lever is supplied by an electric motor 15, which may be a low voltage squirrel cage induction motor. The rotor shaft of the motor 15 carries a pinion 16 which drives a reduction gear train designated as a whole at 17. The reduction gear train 17 actuates a driving gear wheel 18, which is provided with a crank pin 19. The crank pin 19 is pivotally connected to one end of a link 20, and the opposite end of this link 20 is pivotally connected as at 21 to a driving member in the form of a clutch plate 22 also supported for rotation on the bushing 11, as may be seen in Figure 2. One end of this bushing 11 is flanged as at 23 and on the opposite end a nut 24 is threaded to secure the bushing in position and maintain the operating lever 6 and clutch plate 22 on the bushing and against axial although free for rotary movement. Coacting with the clutch plate 22 is a driven clutch member in the form of a clutch bar 25, the end portions of which have clutch pins 26 secured thereto. In the engaged position of the clutch the pins 26 project through openings 27 in the driving clutch plate 22 and also through openings 28 in the enlarged portion 6' of the operating lever (see Figure 4). The central portion of the driven clutch bar 25 is formed with an opening 29 of non-circular form which is snugly fitted on a correspondingly formed portion 29' of a shaft 31 and is held in position thereon and thus effectively fixed to shaft 31 by means of a nut 30 threaded on the extreme inner end of the shaft. The shaft 31 is fitted for rotary and sliding motion in the bushing 11 and projects well beyond the front end of the bushing and extends through an insulating panel 32 suitably supported in the housing and also extends through the cover 33 constituting the forward part of the housing, the extreme front end of the shaft 31 terminating in a knob 34. A spring 35 encircles a portion of the shaft 31 and is under sufficient compression to tend to maintain the shaft 31 projecting beyond the cover 33.

Referring now to Figure 8, it will be seen that the electric current is taken from a transformer 40 and carried by wires 41 and 42 to binding posts 43 and 44 provided on the insulating panel 32. The binding post 44 is connected directly to one side of the motor 15 by means of a wire 45. In the actual construction the wire 45 may consist of several sections but the sections are always electrically connected and so function as a single conductor. The binding post 43 is connected by a wire 46 with a binding post designated at W. The binding post W is the conventional so-called "white" binding post or terminal and is disposed between binding posts R and B, which are the conventional binding posts of red and blue, respectively. The binding post W connects by a wire 47 (see Figure 8) with the movable blade contact 48 of a conventional room thermostat or thermostatic switch designated generally at 49. The binding posts R and B connect by wires 50 and 51 with the contacts R^1 and B^1 of the thermostatic switch. Electrically connected with the binding posts R, W and B are the contacts R^2, W^2 and B^2, of a cycle-maintaining switch. Slidably across these contacts R^2, W^2 and B^2, so as to be successively engageable therewith, is a movable contact 52. This movable contact 52 may be in the form of a button 53 carried by an insulating arm 54 constrained to rotate with the shaft 31 and urged toward the contacts R^2, W^2 and B^2 by a spring 54' (see Figures 2 and 4). The movable contact 52 is electrically connected to one side of the motor 15 by wires 55 and 56.

The structure as thus far described is a complete and operative unit and may be used to advantage under many circumstances. With this structure when the fire is to be stoked the knob 34 is pressed inwardly. This moves the clutch bar 25 and its pins 26 rearwardly and disengages them from the openings 28 of the operating lever. The operating lever is then moved to a horizontal position. In this position both the direct draft damper and the check draft damper are closed. The movement of the operating lever to horizontal position shifts the openings 28 out of register with the pins 26 and consequently the pins bear against an imperforate portion of the lever with the result that the clutch is this time disengaged and the knob 34 and the shaft 31 held retracted. Should the thermostat change its position the motor will be started up.

For example, if the operating lever had occupied the position shown in full lines in Figure 1 just prior to the shifting thereof to horizontal position, then the check draft damper would have been closed and the direct draft damper opened. This would mean, of course, that the room thermostat had had its movable blade contact 48 engaged with contact R^1 and that a cycle of operations had been completed, the contact 52 of the cycle-maintaining switch having moved down into engagement with contact B^2 and having thereby interrupted the motor circuit, assuming, of course, that the contact 48 of the room thermostat still remains engaged with the contact R^1. If now, after disengagement of the clutch and manual shifting of the lever 6 to horizontal position, the blade 48 moves over into engagement with the contact B^1, the room thermostat having been satisfied, then a circuit will be completed through the motor, for the current will flow through the wire 41, binding post 43, wires 46 and 47, contacts 48 and B^1, wire 51, contact B^2, contact 52 and wires 55 to 56 to one side of the motor 15 and thence from the other side of the motor back through wire 45 to binding post 44 and through the

wire 42 to the other side of the transformer. The motor starting up will act through the reduction gear to drive the gear wheel 18 and its crank pin 19. This will move the link 20 and consequently the plate 22, pins 26 and bar 25 until the pins again come into registry with the openings 28 in the lever 6. When this registration is brought about the spring 35 causes the pins 26 to snap back in the position shown in Figure 4, thereby establishing a driving connection between the motor and the operating lever and also between the motor and the movable contact of the cycle-maintaining switch. The operation of the motor will now continue and the lever will be shifted to the inclined position shown in dot and dash lines in Figure 3, and the contact 52 will be shifted up into engagement with the contact R^2, whereupon the motor circuit will be broken. The motor, however, remains under the full control of the room thermostat and will automatically function to rock the operating lever to one position or the other, depending upon the condition of the room thermostat.

In some instances it may be desirable to have the motor operate independently of the room thermostat during the stoking period and after the operating lever has been shifted to horizontal position and yet so operate that the clutch will not be engaged until after sufficient time has elapsed to allow for a full stoking period. It will be remembered that one side of the transformer is directly connected with one side of the motor. A direct connection or an electrical connection independent of the room thermostat may also be provided between the other side of the transformer and the motor, this second direct connection being made and broken under the control of a switch which may be conveniently interlocked with or controlled in its operation by the clutch, so that when the clutch is thrown out the switch will be closed and when the clutch is thrown in the switch will be opened.

Further, a second set of reduction gearing may be provided between the motor and may be operatively interposed between the first set of reduction gearing and the driving gear when the clutch is thrown out or disengaged so that the motion transmitted to the driving gear and consequently to the clutch plate, clutch bar and clutch pins will be somewhat slower whereby sufficient time will be required for the clutch pins to again come into registry with their co-operating openings in the operating lever, to insure an adequate stoking period. Here again the shifting of the second set of gearing into and out of operative position may be conveniently controlled from the operating means for the clutch whereby when the clutch is thrown out the second set of gearing will be thrown in and vice versa.

Referring now to Figures 1, 4 and 8, it will be seen that the binding post 43 may be connected by wire 60 with a fixed contact 61 of what may be termed a stoking switch. Cooperable with the fixed contact 61 is a movable contact 62 which may be of the shape shown in Figure 4, fastened by rivet 63 to the insulating panel 32 and biased by its inherent resiliency to disengaged position. The movable contact 62 has its free end of arcuate form as shown at 62′ in Figure 1, and this arcuate portion is engaged by a roller 64 carried by a pin 65 which extends through a slot 52′ in the insulating arm 52 and which is threaded into the shaft 31 as clearly shown in Figure 4. The pin 65 thus serves to constrain the roller to move with the shaft 31 and also function to constrain the arm 52 to rotate with the shaft 31. As will be seen from Figure 4 this arm 52 is held against motion in the direction of the axis of the shaft 31 by virtue of its abutting panel 32 at one side and its engagement with the spring 35 on the other side. The movable contact 62 of the stoking switch is electrically connected by rivet 63 with the wire 67 electrically connected to wire 56 leading to one side of the motor 15.

From this it will be seen that whenever the shaft 31 is pressed inwardly the contact 62 will be flexed into engagement with the contact 61 and the motor circuit will be completed independently of the room thermostat. However, when the shaft 31 is in its outermost position the contact 62 automatically disengages from the contact 61 and leaves the motor circuit under the control of the room thermostat.

To constrain the contact 62 to movement toward and away from the contact 61 a guide pin 68 is secured to the panel 32 and projects outwardly therefrom and through a guide slot 69 in the contact 62.

Referring now to Figures 2 and 5, it will be seen that the gear train 17 drives the driving gear wheel 18 through a pinion 70 mounted on the shaft 71 actuated from the gear train 17 and directly meshing with the gear wheel 18. If desirable, this pinion 70 may be splined on the shaft 71, that is to say, it may be so interconnected with the shaft as to be constrained to rotate therewith and yet free to slide along the shaft. By so mounting the pinion 70 it may be selectively meshed with the gear 18 or may be used to drive a large gear wheel 72 fixed to the hub extension of a pinion 73 mounted for rotation on the short stud shaft 74 and also meshed with the gear wheel 18. When the pinion 70 is shifted into engagement with the large gear wheel 72, the gear wheel 18 is driven at a still slower speed, since the gear wheel 72 and the pinion 73 constitute a second set of reduction gearing.

The shifting of the pinion 70 may be controlled by a shifting lever 75 having its lower end fulcrumed as at 76 on a supporting stud 77 secured to the partition 13 and having its upper end of forked formation and interfitted with an annular groove 78 formed in an extension of the hub of the pinion 70. The intermediate portion of the shifting lever 75 may be apertured as at 79 and provided with lugs 80 projecting into the aperture and confined between the clutch bar 25 and the nut or head 30 secured on the adjacent end of the shaft 31. With this arrangement the shaft 31 may rotate independently of the lever 75. However, when the shaft 31 is pressed inwardly the lever 75 is shifted from the position shown in full lines in Figures 2 to the position shown in dotted lines in the same figure, with the result that the pinion 70 is disengaged from the gear wheel 18 and meshed or engaged with the gear wheel 72. When the shaft 31 moves back to its normal position it carries the lever 75 with it and consequently the pinion 70 is moved back into mesh with the gear wheel 18.

The stoking period may also be prolonged for a desired length of time by having the stoking switch operate through a delayed action relay in completing the motor circuit. In other words, when the knob is pressed in to disengage the clutch and permit the operating lever to be

moved manually to neutral or horizontal position, although the stoking switch is closed, it does not function to directly close the motor circuit but energizes the delayed action relay. For example, the stoking switch may be utilized to complete a circuit through a heating element or resistor in operative relation to a thermostatic switch, as for instance, a bi-metallic element. The bi-metallic element coacts with two fixed contacts, so organized with the other instrumentalities that when the bi-metallic element is cold it coacts with the contact which incorporates the room thermostat in the system as the dominant control element, whereas when the bi-metallic element is heated it coacts with the contact so arranged in the system as to complete the motor circuit independently of the room thermostat.

Referring now to Figures 8 to 13, inclusive, it will be seen that this embodiment of the invention is identical with that hereinabove described, except that it varies slightly the position of the driving gear wheel 18, omits the second set of gearing, the shifting means for throwing the second set of gearing into and out of operation and introduces the delayed action relay. As in the other embodiment, the motor 15 drives the reduction gear train 17, which actuates the driving gear wheel 18. The driving gear wheel 18 acts through the crank pin 19 and link 20 to operate the clutch plate 22. The clutch plate 22 is operatively associated with the clutch bar 25, clutch pins 26 and with the operating lever 6 as in the other form of the invention. The clutch is thrown in and out by the shaft 31 as before and the shaft 31 has associated therewith the cycle-maintaining switch, including the insulating arm 54, movable contact 52 and fixed contacts R^2, W^2 and B^2. The stoking switch also comprises, as before, the contacts 61 and 62, the roller 64 and associated parts.

Referring now to Figure 13, it will be seen that the room thermostat or thermostatic switch 49 is connected to the binding posts R, W and B as before, and further, that the transformer 40 is connected up to the binding posts 43 and 44 as before. The binding post 43 is electrically connected by wire 46 with a binding post 85. The binding post 85 connects by a wire 86 with one side of the motor M and by a wire 87 with one terminal of a resistor or electric heating element 88. The other terminal of the heating element 88 connects by a wire 89 with the contact 61 of the stoking switch. The contact 62 of the stoking switch connects by a wire 90 with the binding post 44. Wire 46' also connects binding post 44 with contact W^2 which is at all times electrically connected with binding post W. An extension 90' of the wire 90 connects binding post 44 with the contact 91 of a thermostatic or heat controlled switch T. Opposite the contact 91 is a second fixed contact 92 connected by wire 93 with the movable contact 52 of the cycle-maintaining switch. The thermostatic switch T also includes a bi-metallic or heat responsive contact member 94, the free end of which is engageable with the fixed contacts 91 or 92 and the fixed end of which is fastened to and insulated from a supporting bracket 95 and is electrically connected by wires 96 to one side of the motor.

With this organization, when the knob 34 is pressed inwardly the contact 62 of the stoking switch is engaged with the contact 61. This completes the circuit through the resistor 88, the current flowing from binding post 44 through wire 90, contacts 62 and 61, wire 89, resistor 88, wire 87, binding post 85, and wire 46 back to the binding post 43. At this time the bi-metallic element 94 is engaged with the contact 92 and the motor circuit can only be completed through the room thermostat. However, as the resistor 88 heats up the bi-metallic element, the bi-metallic element flexes until its free end is disengaged from the contact 92 and engaged with contact 91. The disengagement of the bi-metallic element 94 from the contact 92 makes it impossible to complete the motor circuit through the room thermostat, and the engagement of this element 94 with the contact 91 completes the motor circuit independently of the room thermostat, since the current now flows from the binding post 44 through wires 90 and 90' to contact 91, thence through bi-metallic element 94 and wires 96 to one side of the motor. Leaving the other side of the motor the current flows through wire 86, binding post 85, and wire 46 back to binding post 43. This condition obtains and the motor is running until the clutch is re-engaged, at which time the spring 35 shifts the shaft 31 outwardly, thereby opening the stoking switch and interrupting the flow of current to the heating element 88. The heating element 88 and bi-metallic element 94 cool off with the result that the bi-metallic element disengages contact 91 and engages contact 92, thereby throwing the motor back under the control of the room thermostat.

If desired, a mercury switch 100 of the type operated by tilting may be supported in a carrier or bracket 101 secured to the shaft 31 and as illustrated in Figure 8 the mercury switch may be incorporated in the circuit of a furnace fan motor 102. As is well known, these furnace fans are used to force the circulation of air on warm air heating systems.

In all embodiments of the invention a simple, compact and reliable type of rotary electric motor may be employed and functions through the gearing and the crank, link and clutch mechanism to drive or actuate the operating lever for the dampers in an effective and reliable manner. The clutch is so organized with the operating lever that disengagement of the clutch does not place the lever or the chains connected thereto under any unusual strains. Finally, the assembly has the advantage of being of simple and of very compact construction and is susceptible of being manufactured and installed at a very moderate cost.

The invention claimed is:

1. A control system for a damper comprising an operating lever connected to the damper, a motor, a room thermostat controlling the operation of the motor, motion transmission means between the motor and the lever including a manually releasable clutch to provide for adjustment of the lever independently of the motor for stoking and means for energizing the motor independently of the room thermostat and including a normally open stoking switch interconnected with the manually operable clutch whereby said normally open switch is closed when the clutch is disengaged and is opened when the clutch is engaged, and a delayed action relay incorporated in the motor circuit and controlled by the stoking switch to complete the motor circuit independently of the room thermostat when the stoking switch is closed.

2. A control system for a damper comprising an operating lever connected to the damper, a motor, a room thermostat controlling the oper-

ation of the motor, motion transmition means between the motor and the lever including a manually releasable clutch to provide for adjustment of the lever independently of the motor for stoking and means for energizing the motor independently of the room thermostat and including a normally open stoking switch interconnected with the manually operable clutch whereby said normally open switch is closed when the clutch is disengaged and is opened when the clutch is engaged, and a delayed action relay incorporated in the motor circuit and controlled by the stoking switch to complete the motor circuit independently of the room thermostat when the stoking switch is closed, said delayed action relay including a thermostat switch having a bi-metallic element, fixed contacts cooperable with said bi-metallic element and connected in the motor circuit to provide for the completion of the circuit through the room thermostat when the bi-metallic element is cold and for completion of the motor circuit independently of the room thermostat when the bi-metallic element is heated and an electric heating element in cooperative relation to the bi-metallic element and interconnected with and energized under the control of the stoking switch.

3. A control system for dampers comprising an operating lever connected to said dampers, a motor, a room thermostat controlling the operation of the motor, a set of reduction gearing actuated by the motor, a rotatable driving element actuated from the gear train, motion transmission means actuated from said rotatable driving element and connected to the operating lever for reversely operating the same upon rotation of said driving element, said motion transmission means including a manually operable clutch providing when disengaged for manual shifting of the operating lever, means operated when the clutch is thrown out to complete the motor circuit of the room thermostat, a second reduction gear train, and means operated by the clutch for interconnecting the second reduction gear train between the first mentioned reduction gear train and the rotatable driving element when the clutch is thrown out.

4. A control system for dampers comprising an operating lever connected to the dampers, a motor, a reduction gear train actuated by the motor and having a shiftable pinion, a driving gear element, a second reduction gear train connected with the driving gear element, said shiftable pinion being adapted to directly drive the driving gear element or to drive the second reduction gear train, motion transmission means between the driving gear element and the operating lever and including a manually releasable clutch, a room thermostat controlling the operation of the motor, means operated when the clutch is thrown out to complete the motor circuit independently of the room thermostat and means operated when the clutch is thrown out to engage said shiftable pinion with the second reduction gear set.

5. A control system for a damper comprising an operating lever connected to the damper, a motor, motion transmission means actuated by the motor and including a driving gear wheel having a crank pin, a link actuated from the crank pin, a clutch having a member connected to the link and having pins actuated by said member, said lever having openings with which the pins are engageable when in registry therewith, means for biasing the pins to snap into said openings, manually operable means for disengaging the pins from said openings whereby to permit the lever to be shifted independently of the motor, a reduction gear train controlled by the manually operable means and shifted into operative position between the motor and the driving gear wheel when the clutch is disengaged.

6. A control system for a damper comprising an operating lever connected to the damper, a motor, motion transmission means actuated by the motor and including a drive gear wheel having a crank pin, a link actuated from the crank pin, a clutch driving member pivotally connected to the link, a cooperable clutch member having clutch pins, said clutch driving member and said lever having openings with which said pins are engagaeable when in registry therewith, a shaft fixed to said cooperable clutch member and shiftable to disengage the pins from the openings of the lever and means for biasing the pins to snap into said openings.

7. In a control apparatus for regulating a heating plant, a heat accelerating and retarding means, a thermostat subject to the temperature to be controlled, the thermostat normally controlling the said means, a manually operable mechanism for operating said means independently of said thermostat, a temperature responsive device adapted to restore control to the room thermostat when heated to a predetermined degree, heating means therefor, a source of power, a switch and wires interconnecting the source of power, heating means and switch, the parts being arranged so that manual operation of said mechanism closes said switch.

8. A control system for a damper comprising an operating lever connected to the damper, a rotary motor, motion transmission means actuated by the motor and including a drive gear wheel having a crank pin, a link actuated from the crank pin, a clutch driving member pivotally connected to the link, a cooperable clutch member having clutch pins, said clutch driving member and said lever having openings with which said pins are engageable when in registry therewith, a shaft fixed to said cooperable clutch member and shiftable to disengage the pins from the openings of the lever, means for biasing the pins to snap into said openings, said lever being shiftable angularly with respect to the pins when the pins are disengaged from its openings, whereby the clutch is held disengaged until the pins are again brought into registration with the openings of the lever under the action of the motor, and means for delaying the action of the motor in effecting such registration until after the lapse of a predetermined stoking period.

9. A control system for a damper comprising an operating lever connected to the damper, a rotary motor, motion transmission means actuated by the motor and including a drive gear wheel having a crank pin, a link actuated from the crank pin, a clutch driving member pivotally connected to the link, a cooperable clutch member having clutch pins, said clutch driving member and said lever having openings with which said pins are engageable when in registry therewith, a shaft fixed to said cooperable clutch member and shiftable to disengage the pins from the openings of the lever, and means for biasing the pins to snap into said openings, said lever being shiftable angularly with respect to the pins when the pins are disengaged from its openings, whereby the clutch is held disengaged until the pins are again brought into registration with the

openings of the lever under the action of the motor.

10. A control system for a damper comprising an operating lever connected to the damper, a rotary motor, gearing actuated by the rotary motor, motion transmission means actuated by the gearing for rocking the lever first in one direction and then in the other upon continuous operation of the motor in one direction, said motion transmission means including a clutch for establishing a driving connection between the motion transmission means and the lever, manually operable means for shifting the clutch to disengaged position wherein the driving connection between the motion transmission means and the lever is broken, said lever being shiftable out of predetermined angular relation with said clutch when the clutch is disengaged, and yieldable means for urging the clutch to engaged position, said clutch being movable to engaged position under the influence of said yieldable means only when the predetermined angular relation between the lever and the clutch has been re-established.

11. A control system for a damper comprising an operating lever connected to the damper, a rotary motor, gearing actuated by the rotary motor, motion transmission means actuated by the gearing for rocking the lever first in one direction and then in the other upon continuous operation of the motor in one direction, said motion transmission means including a clutch for establishing a driving connection between the motion transmission means and the lever, manually operable means for shifting the clutch to disengaged position wherein the driving connection between the motion transmission means and the lever is broken, said lever being shiftable out of predetermined angular relation with said clutch when the clutch is disengaged, yieldable means for urging the clutch to engaged position, said clutch being movable to engaged position under the influence of said yieldable means only when the predetermined angular relation between the lever and the clutch has been re-established, and means for effecting operation of the motor upon movement of the clutch to disengaged position whereby the motor re-establishes said predetermined angular relation between said clutch and said lever.

12. A control system for a damper comprising an operating lever connected to the damper, a rotary motor, gearing actuated by the rotary motor, motion transmission means actuated by the gearing for rocking the lever first in one direction and then in the other upon continuous operation of the motor in one direction, said motion transmission means including a clutch for establishing a driving connection between the motion transmission means and the lever, manually operable means for shifting the clutch to disengaged position wherein the driving connection between the motion transmission means and the lever is broken, said lever being shiftable out of predetermined angular relation with said clutch when the clutch is disengaged, yieldable means for urging the clutch to engaged position, said clutch being movable to engaged position under the influence of said yieldable means only when the predetermined angular relation between the lever and the clutch has been re-established, means for effecting operation of the motor upon movement of the clutch to disengaged position whereby the motor re-establishes said predetermined angular relation between said clutch and said lever, and means for prolonging the time required for the motor to re-establish the predetermined angular relation of and consequently the driving connection between said clutch and said lever.

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