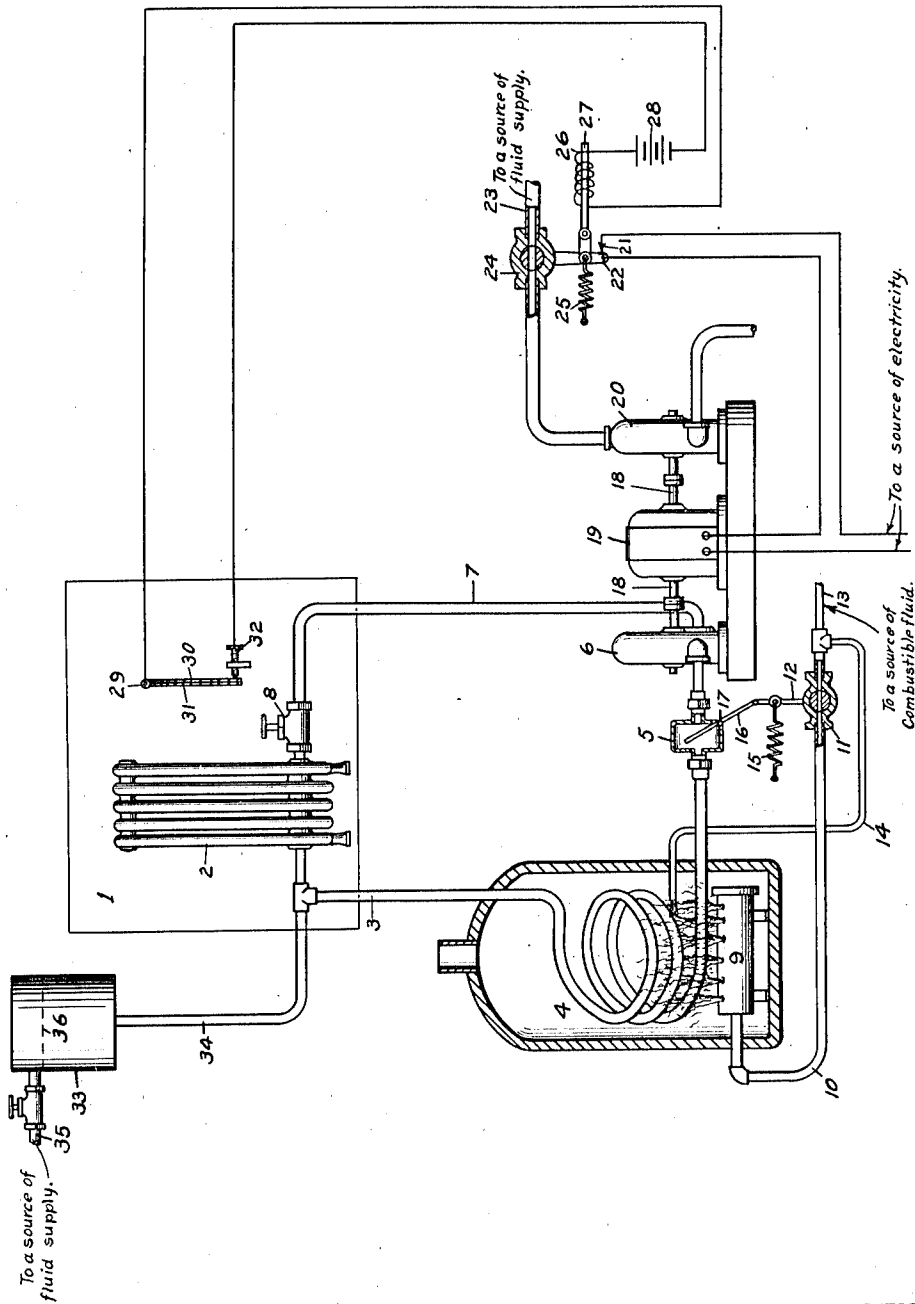


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HEATING SYSTEM.  
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1,061,635.

Patented May 13, 1913.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## HEATING SYSTEM.

1,061,635.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed April 17, 1912. Serial No. 691,335.

*To all whom it may concern:*

Be it known that I, OSCAR A. ROSS, a citizen of the United States, and resident of the city of Rochester, in the county of Monroe and State of New York, have invented a new and useful Heating System, of which the following is a specification.

This invention relates to a heating system.

The primary object of this invention is to produce a system, whereby a fixed temperature may be automatically maintained, in a closed space, for any length of time, without any attention to the apparatus immediately concerned.

Other advantages of applicant's system will appear as the description of the same progresses.

In the single figure accompanying this specification, applicant has shown, schematically, a preferred form of his invention, to enable a better understanding of the same to be had.

Numeral 1, designates a space, which it is desired to maintain at a constant temperature. In order to heat the air contained in the space, the radiator 2 is used, one end of which is connected, by means of pipe 3, with one end of a coil of pipe 4, the other end of the coil being connected through a valve actuator 5 with the exit end of a pump 6. The suction end of the pump is connected, by means of pipe 7, with the other end of the radiator 2, through the ordinary valve 8.

The radiator 2, pipe 3, coil 4, actuator 5, pump 6 and pipe 7 are completely filled with a fluid, preferably water, which is heated by the fluid burner 9, the flame from which impinges upon the outer surface of the pipe of coil 4. If found necessary or desirable the pipe 3 may be connected to the well known expansion tank 33, by pipe 34, and the tank may be connected by means of pipe 35 to a source of fluid supply. By such means the system may be kept completely filled with fluid at all times with no danger from expansion of the fluid by heat, as the excess volume may pass into the expansion tank which is kept filled only to the level of line 36.

The burner 9 is supplied with a combustible fluid by means of pipe 10, connected through valve 11 with a pipe 13, which is connected to a source of combustible fluid. The pipe 14 connects with pipe 13 at one end, and ends with a small bore, in proximity to burner 9 at the other end. The com-

bustible fluid issuing from the end of pipe 14 is lighted and allowed to burn continually. The valve 11 has a stem 12, to which one end of a retractile spring 15 is attached, the other end of the spring being attached to a fixed object. To the upper end of the stem 12, a member 16 is attached, which is pivoted at 17 and extends within the actuator 5, and has the end within the actuator so formed and positioned, that a flow of fluid through the actuator causes the member 16 to assume the position shown in the figure. If the flow of fluid ceases, the spring 15 causes member 16 to swing to a vertical position, and causes stem 12 to be drawn to the left of the position as shown in the figure, thus closing valve 11 and cutting off the supply of combustible fluid to the burner 9.

The pump 6 is directly connected, by means of shaft 18, with electric motor 19 and fluid motor 20. The circuit for the electric motor is completed by contact point 21 and arm 22 contacting. Fluid pressure is admitted to fluid motor 20 from pipe 23 through valve 24, which is shown in the open position.

Arm 22 has a retractile spring 25 connected thereto, which if unrestrained would cause valve 24 to close and arm 22 and contact 21 to break contact. The spring is restrained, when solenoid 26 is energized, for then the core 27 is pulled to the right as shown in the figure and keeps valve 24 open and contact 21 and arm 22 in contact.

Solenoid 26 is energized from battery 28, through thermostat 29. The thermostat 29 may be of any usual or preferred form, but is here shown as a brass strip 30 riveted to an iron strip 31, so that when the temperature of the space 1 in which radiator 2 and the thermostat is placed is increased beyond a predetermined value the strip 30 breaks contact with the adjustable screw 32 and so breaks the circuit of solenoid 26. If at any time it is desired to change the predetermined temperature it is done by adjusting screw 32.

The operation of the system is as follows: With all of the parts as shown in the figure, thermostat 29 completes the circuit of solenoid 26, which holds core 27 in the extreme right hand position, thus allowing fluid pressure to act upon motor 20 and thus closing the circuit of motor 19, which are caused to revolve and rotate the mechanism of

pump 6 which causes a circulation of fluid in the system of which radiator 2 forms a part. The flow of the fluid causes pivoted member 16 to remain in the position as shown, thus opening valve 11 and allowing combustible fluid to flow to burner 9, which upon burning heats coil 4 and the fluid circulating therethrough. The heated fluid passing through radiator 2 causes the temperature of space 1 to rise. When the temperature of space 1 reaches a predetermined limit thermostat 29 breaks the circuit through solenoid 26, thereby allowing core 27 and arm 22 under the influence of spring 25 to move to the left, thus breaking the circuit through the electric motor and closing the valve 24. As soon as the motors stop, the pump ceases to force fluid through actuator 5, consequently the lower end of pivoted member 16 together with stem 12 are drawn to the left by the action of spring 15, thus closing valve 11 and cutting off the supply of combustible fluid to the burner 9. The system remains in the last described condition until the temperature of space 1 falls so low that brass strip 30 touches adjustable screw 32, whereupon the circuit through the electric motor is again closed, the fluid motor is supplied with fluid pressure and the pump operates to cause a circulation of fluid in the system, which causes pivoted member 16 to move stem 12 against the resistance of spring 15, and opens valve 11, which allows combustible fluid to flow to the burner 9, and be lighted by the lighted fluid issuing from pipe 14. The system is then in the condition as shown in the figure.

Although applicant has illustrated and described two motors; one, an electric motor; the other, a fluid motor, it is to be

understood that one only would be used at one time.

Applicant's system is perfectly automatic, reliable and free from complicated apparatus, which is likely to get out of order, and consequently no skilled attendant is needed to operate it; in fact, no attendant at all is needed, for once started, it should operate indefinitely without attention. Applicant's system therefore possesses great utility. The system is also economical, for energy is used only when the temperature of space 1 falls below a predetermined minimum temperature, at all other times there is no expense to the system except the insignificant cost of the combustible fluid needed to supply pipe 14.

Having thus described the principle of my invention and explained the construction and operation of one particular physical embodiment thereof, what I claim as new and desire to secure by Letters Patent, is:

In an automatic heating system, a thermostat in the space to be heated and governed by the temperature thereof, a motor governed by said thermostat, a pump actuated by said motor, a fluid circuit including a radiator, the fluid of said circuit being caused to circulate by an actuation of said pump, a device through which said fluid flows adapted to be heated, a source of combustible fluid, a combustible fluid burner for heating said device, means to govern the supply of combustible fluid to said burner governed by the flow of said first mentioned fluid.

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Witnesses:

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MYRTLE A. HEATH.