No. 893,124. PATENTED JULY 14, 1908.

R. E. ATKINSON.

HEATING SYSTEM.

APPLICATION FILED OCT. 26, 1905.

2 SHEETS—SHEET 1.

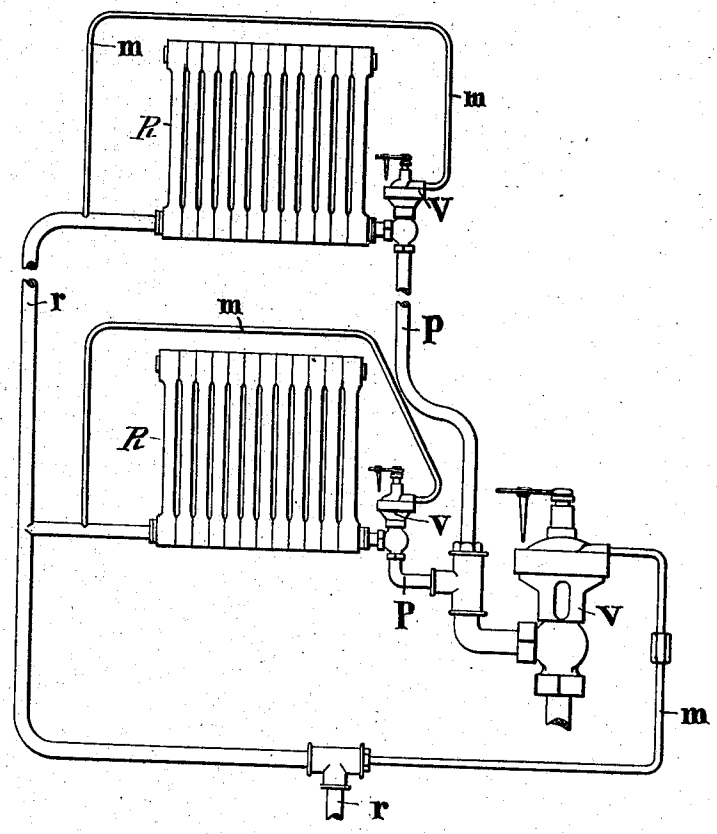

Fig. 1.

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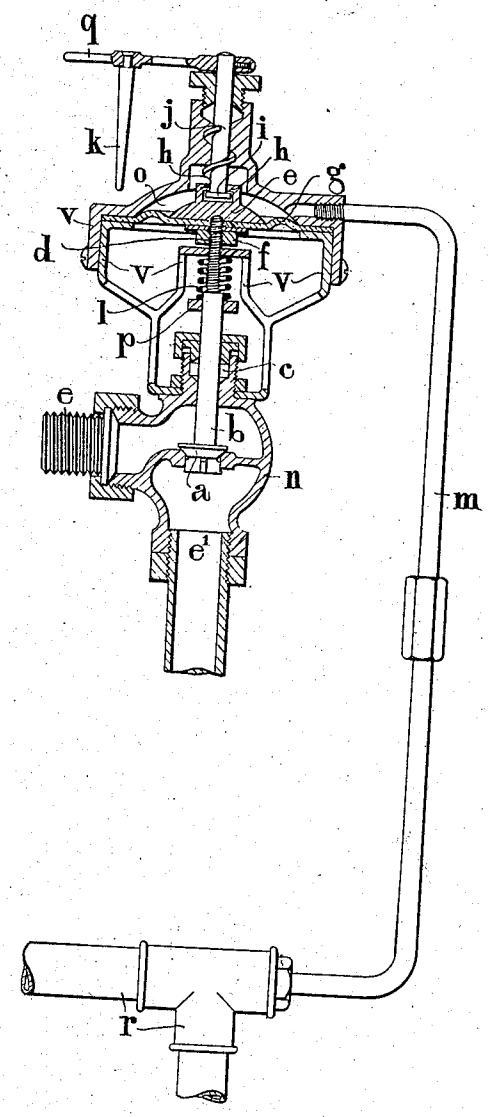
2 SHEETS—SHEET 2

Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

ROBERT ERNEST ATKINSON, OF LEICESTER, ENGLAND.

HEATING SYSTEM.

No. 893,124. Specification of Letters Patent. Patented July 14, 1908.

Application filed October 26, 1905. Serial No. 284,545.

To all whom it may concern:

Be it known that I, ROBERT ERNEST ATKINSON, a subject of the King of Great Britain and Ireland, residing at 57 Evington road, Leicester, in the county of Leicester, England, have invented certain new and useful Improvements in Heating Systems, of which the following is a specification.

This invention relates to steam heating systems of the type wherein the steam is supplied to the various radiators, calorifiers, or the like through a valve which is connected to a diaphragm that is subjected to the atmospheric pressure on the one side and the pressure prevailing in the return pipe on the other side, in order that variations in pressure in the return pipe may cause the valve to open or close, and thereby control the supply of steam according to prevalent requirements, the presence of steam or a rise in pressure in the return pipe causing the valve to be closed, and a fall in pressure in the return pipe causing the valve to open.

The object of the present invention is to enable the automatic diaphragm steam controlling valve, to be directly influenced by the variations in pressure in the return pipe without the intervention of thermostatic devices as hitherto employed, the valve being adapted when required, to be positively closed by hand.

In the accompanying drawings, Figure 1 is a diagrammatic elevation showing the valve on the main and on each radiator, Fig. 2 being a sectional elevation of the valve on the main those on the radiators being of identical construction.

In carrying out the invention a valve V, is mounted on the steam main, M, and a similar valve on each pipe, P, adjacent each radiator, R, that on the main naturally being larger than those on the radiators. Each valve, V, is of the identical construction shown in Fig. 2 which illustrates the valve, V, on the main, M. Each comprises a steam controlling valve, *a*, carried by a valve spindle, *b*, and adapted to seat upon a suitable seating within a casing, *n*. The spindle, *b*, passes through a stuffing box, *c*, and has one end, *d*, screw threaded, in order that it may be screwed into a boss, *e*, upon a diaphragm, *g*, it being locked thereto by a lock nut, *f*. The diaphragm, *g*, is suitably clamped at its circumference to a casing, *v*, the under part of the diaphragm being open to the atmosphere, while the upper side is subjected to the varying pressure within a chamber, *o*. The chamber, *o*, is connected by a pipe, *m*, with the return pipe, *r*. The valve, *a*, tends to close under the action of a spring, *l*, which abuts against the casing, *v*, at one end against a collar *p*, on the spindle, *b*, at the other end. It will thus be understood that as the pressure in the return pipe, *r*, falls, the pressure in the chamber, *o*, acting upon the diaphragm, *g*, on the one side, will also fall, and the effect of the atmosphere on the under side of the diaphragm will be to raise the valve, *a*, from its seat. Therefore, when the pressure in the return pipe falls below a predetermined limit, the valve, *a*, will rise and admit steam to the radiator or other heater through the branch or connection, *e*, the casing, *n*, being connected to the steam supply pipe, *e'*. If, however, too much steam is being supplied to the radiator, or other unit, the steam is escaping to the return pipe, *r*, then the pressure in the chamber, *o*, will rise and will overcome the effect of the atmospheric pressure on the under side of the diaphragm, and the valve, *a* will be closed.

In order that the valve, *a*, may be positively closed by hand, when it is desired to close down the radiator or other unit or system the supply of steam to which is controlled by the valve, *a*, the boss, *e*, on the diaphragm, *g*, is formed with two lugs, *h*, under which a collar, *i*, on a spindle, *j*, engages with a certain amount of play. The clearance between the collar, *i*, and the lugs, *h*, and also between the collar and the boss, *e*, is sufficient to allow the valve, *a*, to lift to an extent to give a maximum opening as long as the spindle, *j*, is in the normal position. The spindle, *j*, is provided with a screw thread of rapid pitch, and also fitted with a handle, *q*, provided with a pointer, *k*, so that, when desired, the spindle can be given a vertical rotation by hand, which will cause the collar, *i*, to thrust down the boss, *e*, of the valve spindle, *b*, sufficiently to close the valve, *a*.

A valve constructed and operated according to the invention can be applied to a heating system upon the steam supply pipe or main only, to each supply pipe for each individual unit or radiator in the system, only or in both positions as in the example described.

Having now described my invention, what

I claim as new and desire to secure by Letters Patent is:—

In a heating system comprising a plurality of radiators a steam supply main, supply pipes therefrom to the radiators, a return main and a diaphragm valve on each radiator supply pipe, and a direct connection between one side of said diaphragm and the return main, the combination of a diaphragm valve on the supply main also having a direct connection between one side of its diaphragm and the return main substantially as and for the purpose hereinbefore described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT ERNEST ATKINSON.

Witnesses:

ALBERT E. PARKER,

BERTRAM H. MATTHEWS.