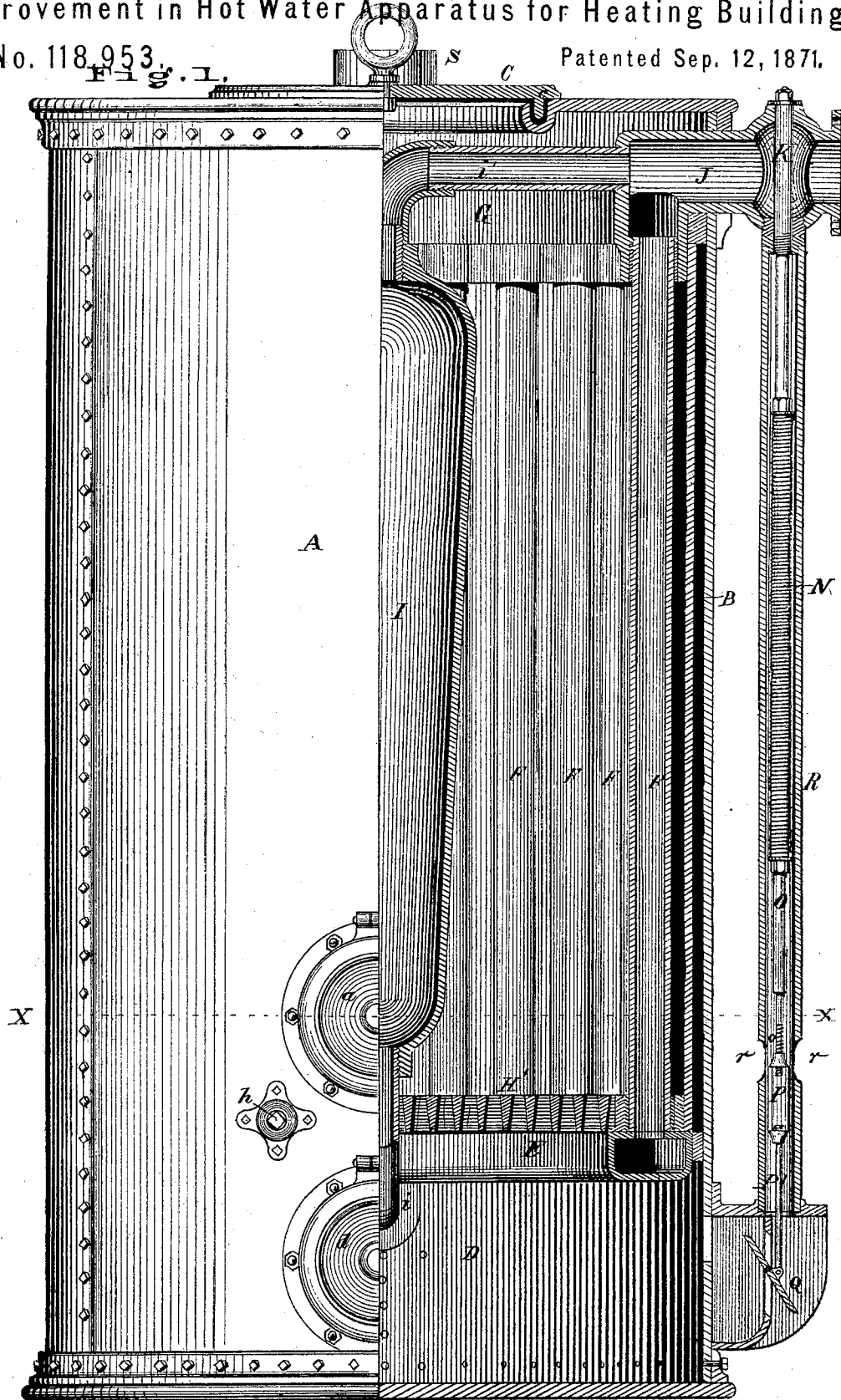


Improvement in Hot Water Apparatus for Heating Buildings.

No. 118,953.

Patented Sep. 12, 1871.



ATTEST.

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INVENTOR.

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By Knight, Bros. & Co. Atty.

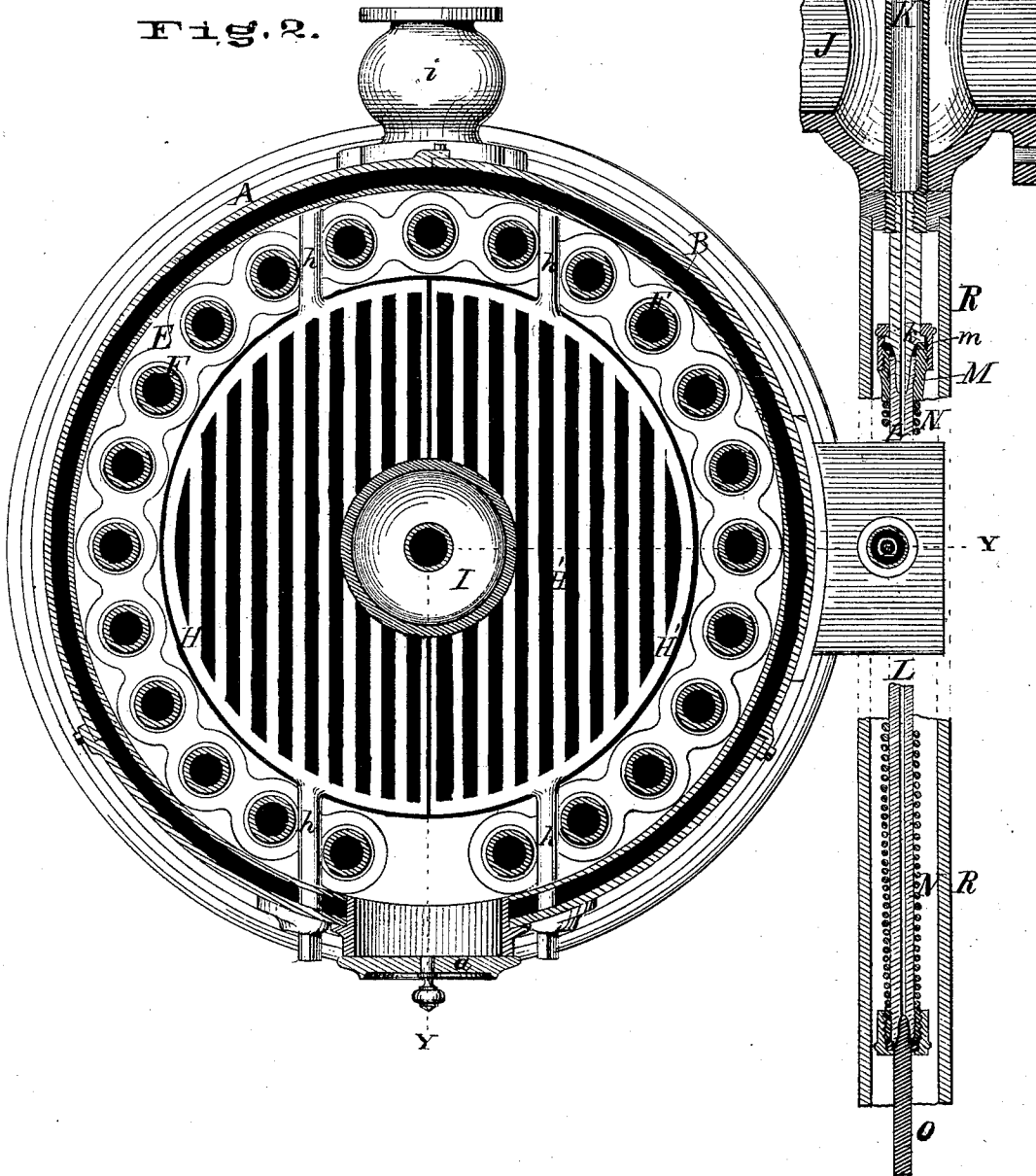
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Fig. 3.

Fig. 2.



ATTEST:

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UNITED STATES PATENT OFFICE.

AMBROSE MARRIOTT, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN HOT-WATER APPARATUS FOR HEATING BUILDINGS.

Specification forming part of Letters Patent No. 118,953, dated September 12, 1871.

To all whom it may concern:

Be it known that I, AMBROSE MARRIOTT, of St. Louis, in the county of St. Louis and State of Missouri, have invented a certain new and useful Improved Hot-Water Apparatus for heating buildings, of which the following is a specification:

My invention relates partly to an apparatus for heating buildings, secured to me by English patent No. 948, of 1863, (dated April 15, 1863,) and partly to improvements thereon.

In the English patent the fuel space of the base-burning furnace is surrounded by water-pipes connecting an upper and lower annular water-chamber, from the upper one of which the water is discharged through an enlargement in the pipe, in which is a globular vessel containing mercury, and communicating by an elastic tube with the damper of the furnace, so that the increased heat of the water will expand the mercury and elongate the elastic tube, and partially close the damper to diminish the heat of the fire by lessening the draught, the length of the damper-rod being adjusted by a screw-swivel at its lower end.

My present improvement consists, principally, in the introduction of a central water-chamber of upwardly-increasing diameter; in a tilting grate, consisting of two semicircular segments, perforated centrally to allow passage to the water-chamber or a pipe leading therefrom, said grate being above the level of the lower annular water-chamber; and in the substitution, for the globe containing mercury, of a cylindrical section of pipe of somewhat larger diameter and bore than the elastic part.

Figure 1 shows my heater, one-half in elevation and one-half in axial section at the line *y y*, Fig. 2. Fig. 2 is a horizontal section at the line *x x*, Fig. 1. Fig. 3 is an enlarged view of portions of the regulator in axial perspective.

A is a cylindrical case, having an air-jacket, B, to check the escape of heat. In the top of the case is a central opening, covered by a lid, C, whose flange, *c*, enters a groove surrounding the opening, said groove containing sand to prevent the escape of smoke beneath the flange *c*. D is the ash-pit, having a tightly-fitting door, *d*, and around the upper part of the ash-pit is an annular water-chamber, E, whose rear part communicates with the feed-water pipe *i*. The annular chamber E communicates, by a number of

vertical water-pipes, F, with a similar water-chamber, G, near the top of the case. One or more of the pipes F are cut away at the furnace-door *a* to allow access to the furnace-grate, the lower-ends of said pipes communicating with a segmental chamber about level with the top of the door *a*, and said chamber communicating with the annular chamber E by the pipes F at its ends. Above the level of the water-chamber E is the grate, consisting of two semicircular segments, H H', made to tilt on their supporting pivots *h*, one end of which upon each section is squared to receive a lever by which the grate is tilted. I is a central water-vessel, receiving water through the feed-pipe *i* at its lower end, and discharging at the top by means of the horizontal pipe *i'* into the discharge-pipe J, which is also in communication with the annular chamber G, and receives water therefrom.

The vessel I has greater diameter at its upper than at its lower end, as shown, which formation has the following advantages: First, it allows the easy subsidence of the fuel. Second, it is more strongly affected by the ascending heated currents. Third, it allows the more free upward movement of the heated water.

The heated water passing out through a pipe, J, heats a vertical pipe, K, containing mercury. The said pipe has a nipple, *k*, which is forced into the end of the India-rubber tube L, and expands it into the sleeve M of the coupling, which latter has a screw-cap, *m*, acting on a collar of the pipe K to hold the pipe and the rubber tube together. The rubber tube is surrounded by a spiral, N, of wire, to prevent the radial expansion of the rubber, but to allow and assist its elongation, for as the spiral is elongated it grasps the tube more tightly and conduces to its lengthening. The lower end of the rubber tube L and spiral N is coupled to a rod, O, ending in a screw, *o*, screwing into a swivel, P, whose rod, P', is hinged to a damper, Q, in such a manner that the elongation of the elastic tube will partially close the damper, and its contraction open the same. The regulator pipe is inclosed in a case, R, which has apertures, *r*, to allow access to the swivel P. S is the smoke-pipe.

The water enters through the pipe *i*, and passes upward into the rear part of the annular chamber E, and into the lower end of the central vessel or heating-chamber I, and passing upward through the said central vessel and the pipes F,

the heated water passes out through the pipe J to the heating-pipes in the house, and returning therefrom enters the feed-pipe i, and becomes again heated. When the fire in the furnace becomes too hot, and communicates too much heat to the water, the superabundant heat causes the mercury in the tube K to expand, which results in the elongation of the rubber pipe or tube L, and the partial closing of the damper. The lessening of the draught-opening checks the fire and reduces the heat of the water. When the water becomes too cool the elastic tube contracts and opens the damper more widely, causing an increase of draught and of heat in the fire. To adjust the apparatus to give the amount of heat required, the damper-rod is lengthened or shortened by means of the screw O and swivel P, the lengthening acting to diminish and the shortening to increase the heat.

I claim—

1. In a heating apparatus, substantially as de-

scribed, the central heating-vessel I, having an upwardly-increasing diameter, as described.

2. The regulating apparatus, consisting of the damper Q, swivel P, elastic wire-covered tube L N, and metal tube K, containing mercury, all substantially as set forth.

3. The grate, placed above the level of the lower water-chamber E, and consisting of two semicircular tilting segments, H H', substantially as described.

4. The combination and arrangement of the lower and upper annular water-chambers E G, connecting-pipes F, and central heating-chamber I, all substantially as and for the purpose set forth.

In testimony of which invention I have hereunto set my hand.

AMBROSE MARRIOTT.

Witnesses:

SAML. KNIGHT,
D. A. BRISLIN.