

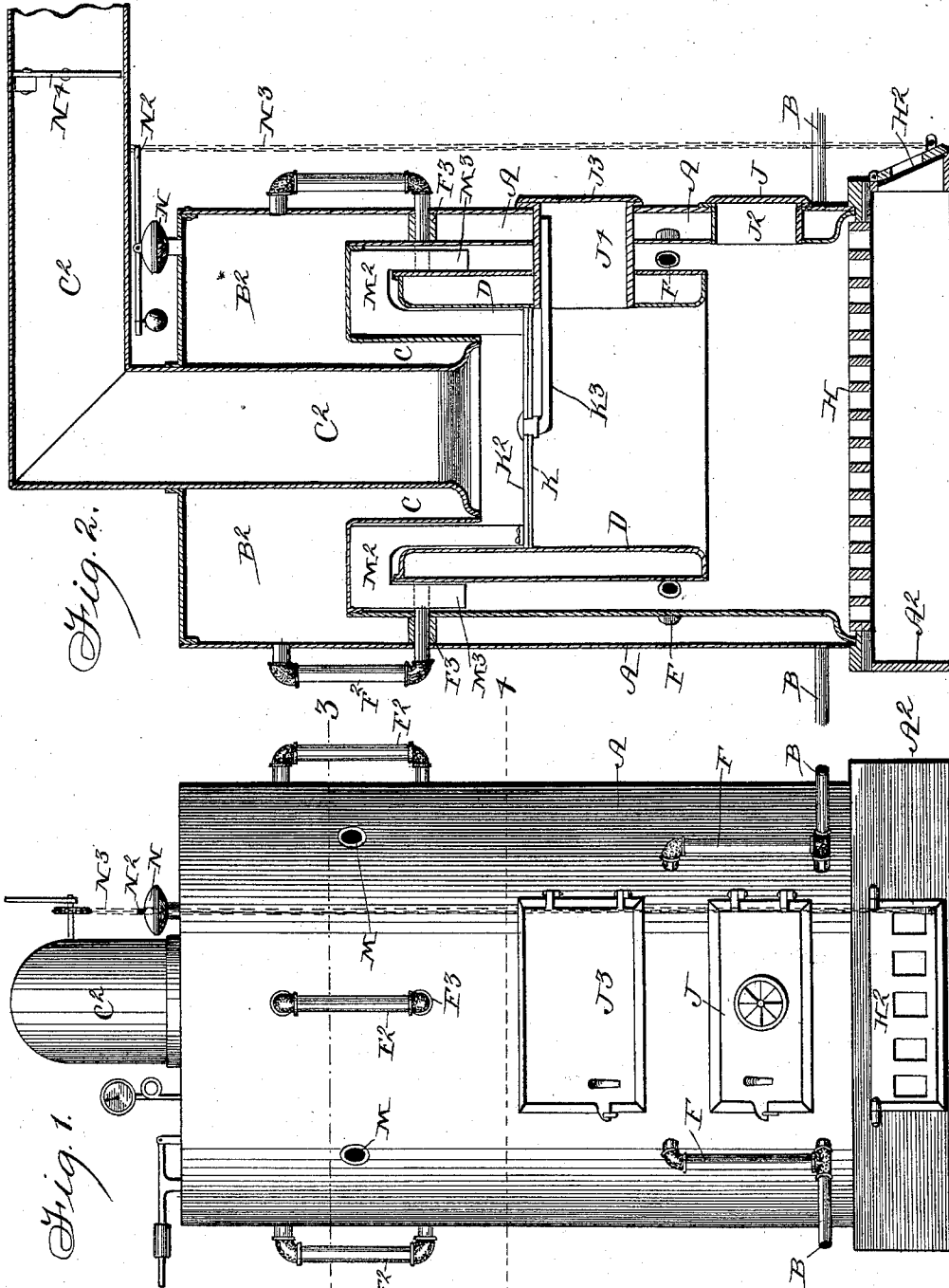
(No Model.)

2 Sheets—Sheet 1.

J. W. HAUGHAWOUT.  
STEAM OR HOT WATER FURNACE.

No. 540,254.

Patented June 4, 1895.



Witnesses:  
R. C. Orwig,  
W. S. Sankey,

Inventor: John W. Haughawout,  
By Thomas G. and J. Ralph Orwig, Attys.

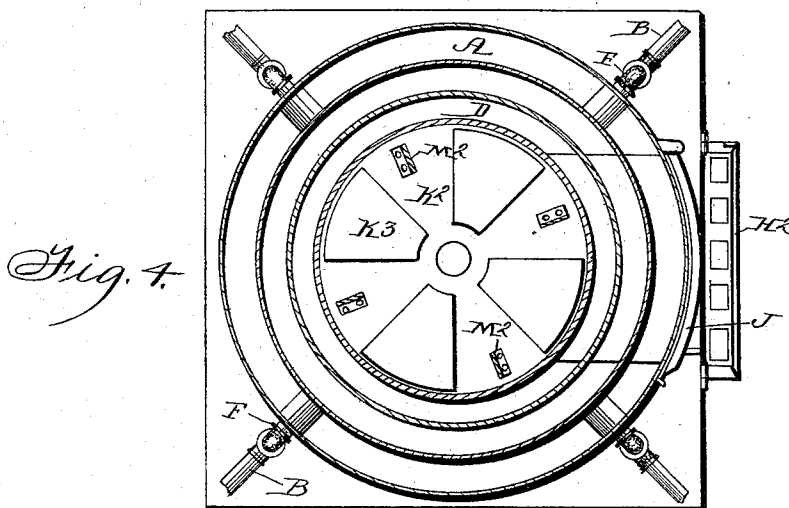
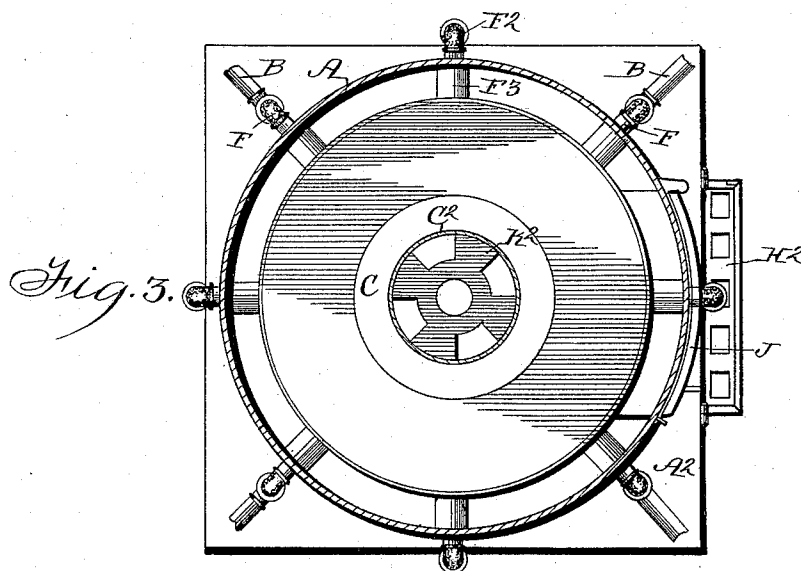
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2 Sheets—Sheet 2.

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Inventor: John W. Haughawout,

By Thomas O. Orwig

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# UNITED STATES PATENT OFFICE.

JOHN W. HAUGHAWOUT, OF FORT DODGE, IOWA.

## STEAM OR HOT-WATER FURNACE.

SPECIFICATION forming part of Letters Patent No. 540,254, dated June 4, 1895.

Application filed April 11, 1895. Serial No. 545,298. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. HAUGHAWOUT, of Fort Dodge, in the county of Webster and State of Iowa, have invented an Improved Steam or Hot-Water Furnace, of which the following is a specification.

The object of this invention is to provide an improved furnace composed of a number of concentric boiler sections and so arranged that heat is applied in the most advantageous manner to heat the water and prevent the radiation of heat from the furnace.

My object is further to provide improved means for removing deposits of soot from the exposed surface of boiler sections and consuming the same.

My object is further to provide means whereby coal may be fed to the furnace by a magazine and gradually consumed.

My invention consists in certain details in the construction, arrangement and combination of the various parts of the device as hereinafter set forth, pointed out in my claims and illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the complete furnace. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a sectional view of the furnace through the line 3 3 of Fig. 1. Fig. 4 is a like view through the line 4 4.

Referring to the accompanying drawings, the reference letter A. is used to indicate the outer casing or boiler section resting upon the base A<sup>2</sup> and adapted to be filled with water through the supply pipes B. At the top of this section is an enlarged chamber B<sup>3</sup> and depending from the central portion of the said chamber is a short annular boiler section C. and C<sup>2</sup> is a flue leading upwardly from the lower end of the said boiler section.

D. indicates the third boiler section, also annular in form and supported with its upper end between the sections A. and C. with a sufficient space between the sections, and its lower end extended to a point just above the fire door J. Water is admitted into this section D. through the pipes F. which lead from the bottom of the section A. outwardly and upwardly and then into the section D. and F<sup>2</sup> indicates like pipes leading from the top of said section into the chamber B<sup>3</sup>. Sleeves F<sup>3</sup> are expanded in the boiler section A. where

the said pipes extend through said section to admit the pipes F. and F<sup>2</sup>, and permit the pipes to be coupled on the exterior.

H. indicates a grate located at the bottom of the boiler section A, and H<sup>2</sup> an ash door below the grate.

J indicates a fire door hinged to the casing A directly above the grate to cover an opening J<sup>2</sup> cut through the said boiler section. J<sup>3</sup> indicates a like door to cover an opening J<sup>4</sup> cut through the sections A. D. for the purpose of admitting fuel into the magazine formed by the lower part of the boiler section D.

K indicates a radially slotted diaphragm located in the section D directly beneath the lower end of the section C, and K<sup>2</sup> is a damper mounted on top of the diaphragm and designed to cover the openings and shake the soot through the slots in diaphragm. This damper may be operated by a lever K<sup>3</sup> fixed to the damper, passed through the diaphragm and extended through the opening J<sup>4</sup> so that it may be readily operated upon opening the door J<sup>3</sup>.

M indicates a series of pipes leading from the outside atmosphere through the boiler section A to admit the cold air when the particles of combustion are obstructed in its course and consumed.

M<sup>2</sup> indicate scrapers riveted to the damper and extended upwardly and then outwardly and downwardly at M<sup>3</sup> to engage the boiler surfaces most liable to receive deposits of soot.

N indicates a steam chest of common form communicating with the top of the boiler and having a weighted lever N<sup>2</sup> fulcrumed to its top arranged to be operated when the steam pressure within the boiler reaches a certain predetermined degree. The opposite end of this lever is connected with a chain N<sup>3</sup> one end of which is attached to the door of the ash pit and the other end to a damper N<sup>4</sup> in the flue. When the steam pressure is so great as to indicate that there is too much fire, the lever is operated, the draft door closed and the damper in the pipe opened thus checking the fire.

When the fire is well started a great quantity of fuel may be shoveled into the furnace through the upper door and retained in the boiler section D and gradually fed to the grate and burned. The heat, it will be seen, will pass upwardly between the boiler sections A

and D and then horizontally inward and downward around the section C to the flue. It is obvious further that air will be admitted through the pipes M, and commingling with the products of combustion will partially consume the soot, smoke, &c. To remove deposits of soot that may have become lodged in the boiler surfaces it is only necessary to operate the lever K<sup>3</sup> whereupon the scrapers attached to the damper will engage said boiler surfaces and scrape the soot into the fire place.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent of the United States therefor, is—

1. In a hot water or steam furnace, a boiler composed of an annular boiler section, a cylindrical top therefor, a flue leading upwardly through said top, a short annular boiler section depending from said top around said flue, a third annular boiler section with its upper end inserted between the aforesaid sections, and its lower end above the lower end of the first section, pipes connecting the outer and inner sections, a passage for the admission of coal through the side of the furnace leading to the interior of said middle section, a horizontal partition in the middle section above said passage, a series of scrapers mounted above the partition and means for operating said scrapers, substantially as and for the purposes stated.

2. In a hot water or steam furnace, a boiler composed of three concentric annular sections

and a top section connecting the outer and inner sections and pipes for connecting the middle and outer sections, of a damper in the central portion of the middle section beneath the end of the inner section and means for operating the damper substantially as and for the purpose stated.

3. In a hot water or steam furnace a boiler composed of three concentric annular sections and a top section connecting the outer and inner sections and pipes for connecting the middle and outer sections of a damper in the central portion of the middle section beneath the end of the inner section and means for operating the damper and a number of scrapers fixed to the said damper and passed upwardly, outwardly and then downwardly substantially as and for the purpose stated.

4. In a hot water or steam furnace a boiler, composed of three concentric annular sections and a top section connecting the outer and inner sections and pipes for connecting the middle and outer sections of a damper in the central portion of the middle section beneath the end of the inner section and means for operating the damper and a series of flues through the outer section beneath the top section, substantially as and for the purpose stated.

JOHN W. HAUGHAWOUT.

Witnesses:

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GEO. S. RIST.