(No Model.) 3 Sheets—Sheet 1.

J. W. HAUGHAWOUT.

STEAM BOILER.

No. 534,690. Patented Feb. 26, 1895.

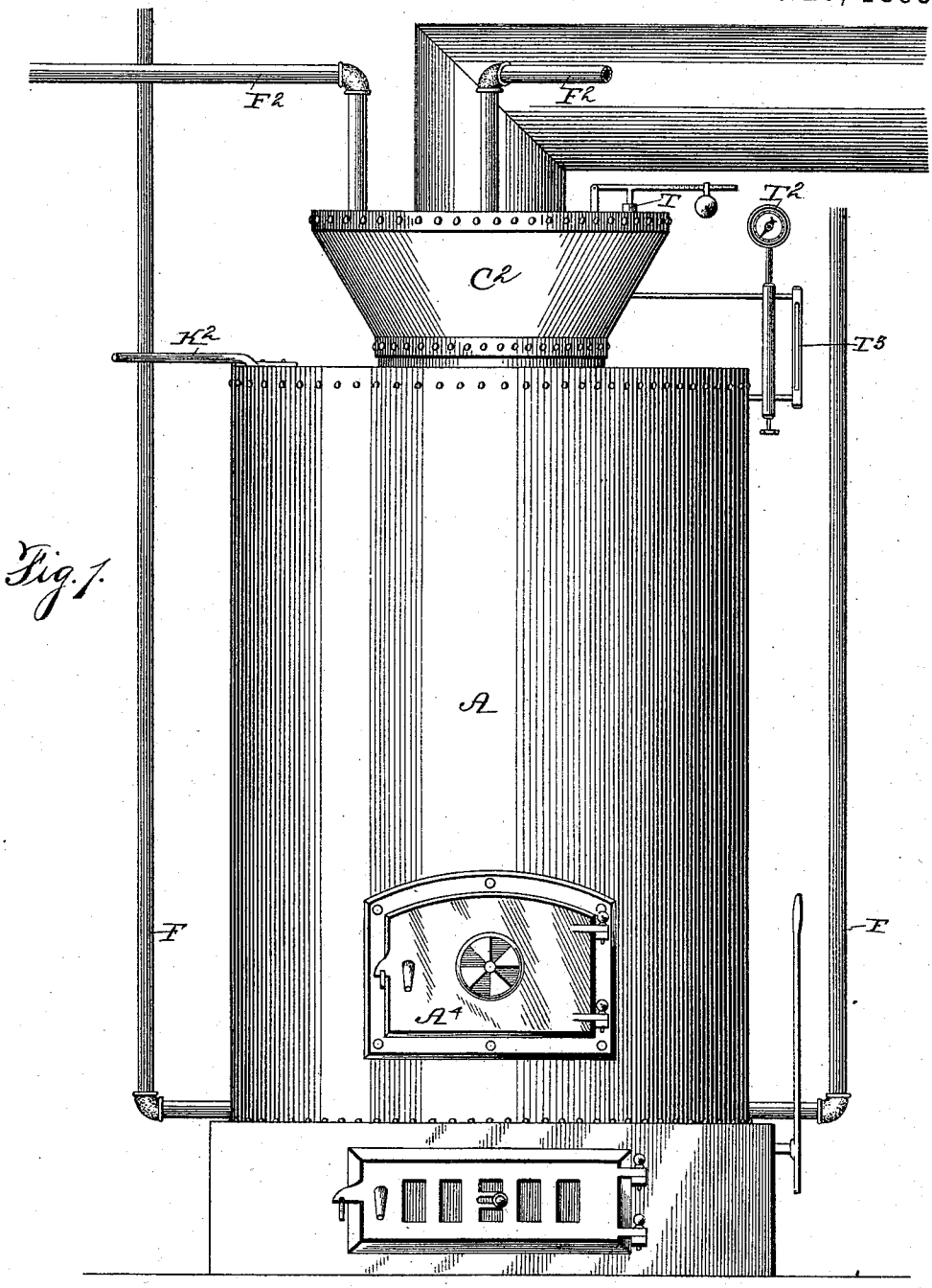

Fig. 1.

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Inventor: John W. Haughawout,
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(No Model.) 3 Sheets—Sheet 2.

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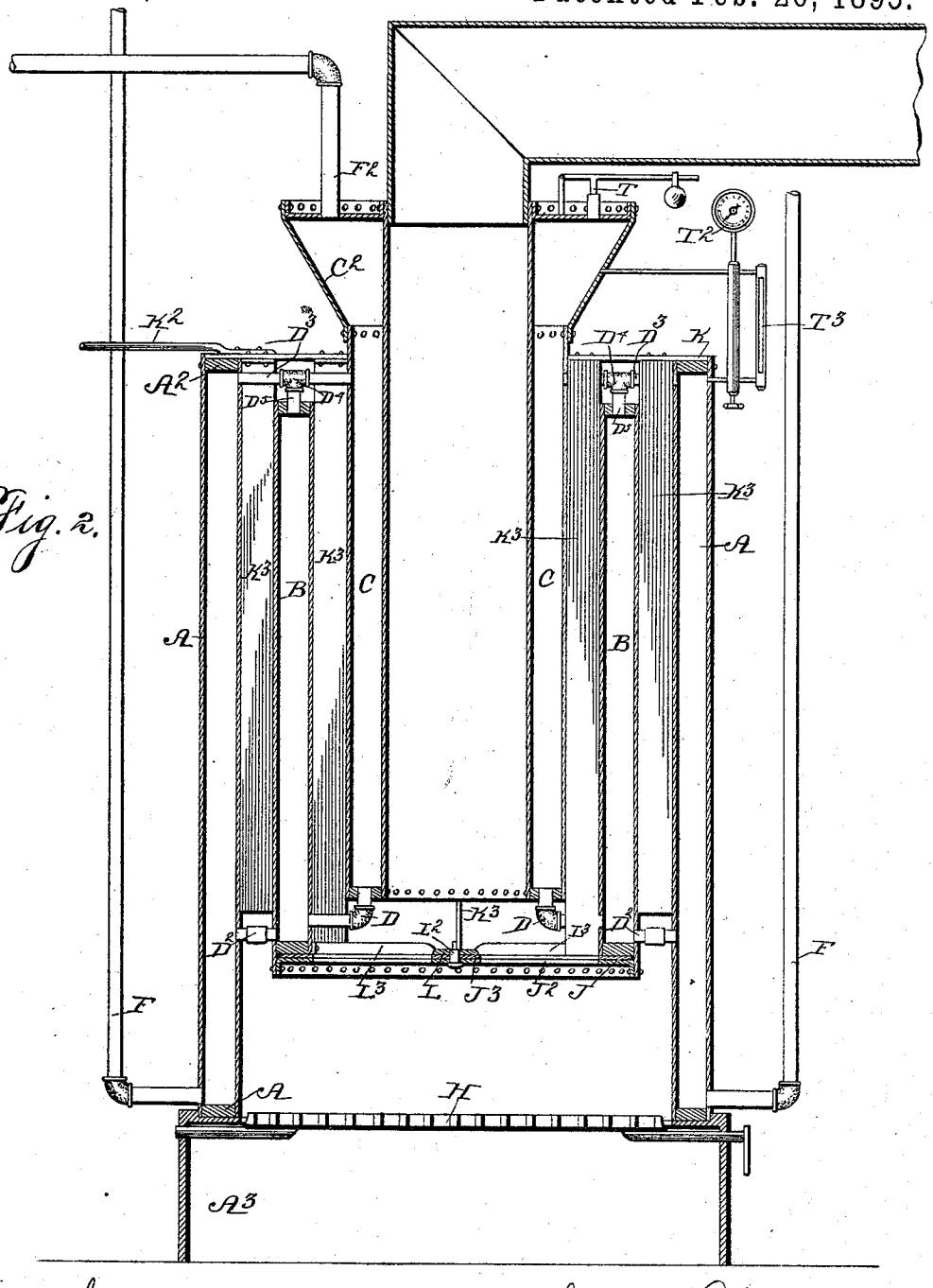
Fig. 2.



Witnesses:
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(No Model.) 3 Sheets—Sheet 3.

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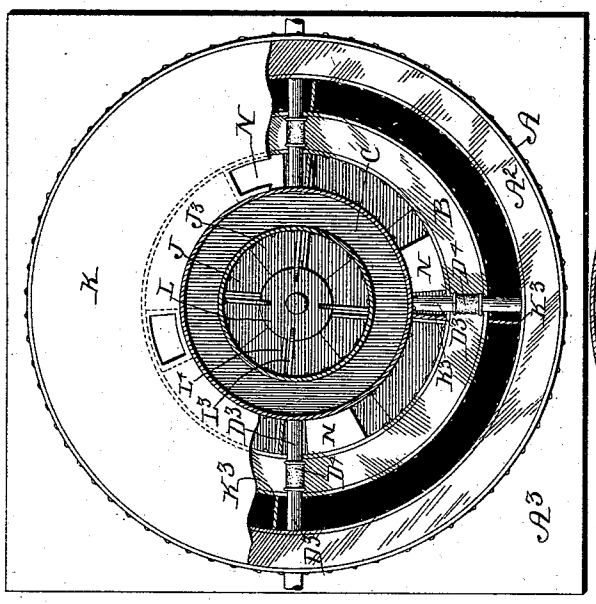

Fig. 4.

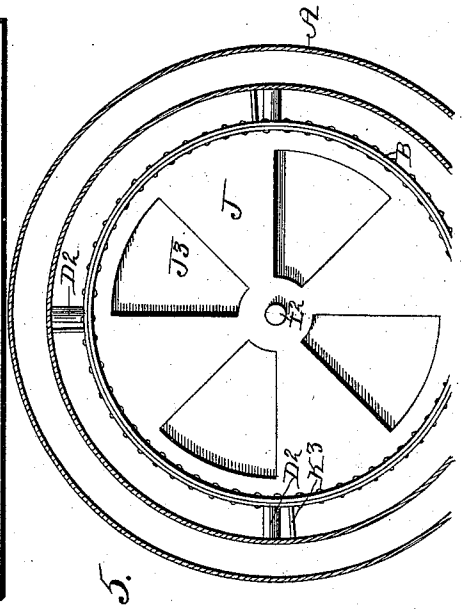

Fig. 5.

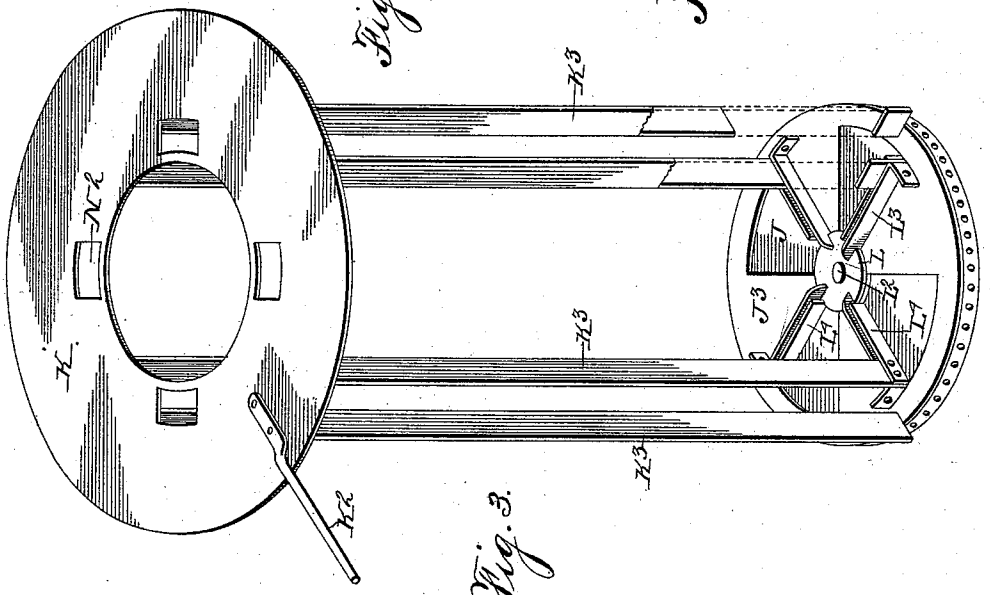

Fig. 3.

Witnesses:
W. J. Sankey.
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UNITED STATES PATENT OFFICE.

JOHN W. HAUGHAWOUT, OF FORT DODGE, IOWA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 534,690, dated February 26, 1895.

Application filed December 12, 1894. Serial No. 531,601. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HAUGHAWOUT, a citizen of the United States of America, residing at Fort Dodge, in the county of Webster and State of Iowa, have invented a new and useful Steam-Boiler, of which the following is a specification.

The objects of this invention are to provide a simple, strong, and durable steam or hot water boiler for heating buildings and in which a comparatively great heating surface is provided.

My object is further to provide means for producing either a straight draft or to carry the products of combustion backwardly and forwardly through the boiler flues so as to utilize all of the heat and further to provide simple, durable and easily operated means for removing soot, &c., from the boiler flues.

With these objects in view 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 the claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the complete device. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a perspective view of the boiler cleaning device and draft controlling dampers connected therewith. Fig. 4 is a top view of the boiler with part of the top plate broken away and the dome removed. Fig. 5 is a bottom view of the boiler showing the damper.

Referring to the accompanying drawings, the reference letter A is used to indicate the outer boiler section composed of two concentric cylinders with the flues between them at their ends closed by the cylinder heads A^2. This boiler section is adapted to rest upon the base A^3 which may be of any ordinary construction.

A^4 is a fire door covering an opening in the lower end of said boiler section.

B indicates a second boiler section of similar construction placed concentrically within the first and having an annular flue between them. This section is much shorter than the outer section and the space between its lower end and the lower end of the outer section is utilized as the fire box or combustion chamber, and its upper end is lower than the outer chamber.

A third section C, hollow like the other, is located concentrically within the first section B. Its top is extended above the horizontal plane of the outer section and its lower end some distance above the section B for purposes hereinafter explained. A dome C^2 with outwardly extending sides is riveted to the top of the section C and communicates therewith. These three concentric boiler sections are connected by means of the pipes D at their bottoms leading from the outer section to the middle section and the pipes D^2 leading from said middle section to the inner section, and at their tops by the means of the straight pipe sections D^3 leading directly from the outer section to the inner one and each having a T-pipe section D^4 at its central portion with a pipe D^5 leading from thence downwarly to the middle boiler section so that a complete circulation of water is permitted throughout all of the boiler sections.

Water is admitted to the boiler by the induction pipes F entering the outer section at its lower end and the eduction pipes F^2 leading from the top of the dome.

H indicates a grate at the bottom of the combustion chamber.

J indicates a circular piece of sheet metal having a series of radial openings J^2 and riveted to the outer sheet of the boiler section B below the bottom of said section. J^3 indicates a mating piece of sheet metal with like openings placed above the part J, so that the openings may be made to coincide or to close communication therethrough.

K indicates a plate on top of the boiler sections arranged to rotate thereon and to close the tops of the openings.

K^2 is a lever by which the same may be turned. K^3 indicates scrapers composed of flat iron bars connected with the plate K above and the inner ones thereof with the plate J^3 beneath the boiler sections, and are of a size adapted to engage both of the adjacent boiler surfaces so as to clean the same as the top is rotated. One of these scrapers is placed between each pair of pipes D^3 and

in each of the annular flues between the boiler sections so that the entire boiler surface is cleaned by a partial revolution of the top K. The soot thus scraped from the boiler sections will become lodged upon the plates J and J^3 and I have provided the following means for scraping the deposit therefrom.

L indicates a collar placed above the center of the plate J^3 and connected therewith by a bolt L^2 passed through both of said slotted plates and the collar and L^3 are radial arms secured to said collar and to the boiler section B with their lower ends in engagement with said upper plate and L^4 are radial arms secured to the upper plate with the lower edges in engagement with the under plate, so that, as the scrapers are turned the soot will be scraped from the boiler sections thereby and from the upper plate by the arms L^3 and the lower plate by the arms L^4.

N indicates a series of metal plates secured to the boiler sections at the top of the inner annular flue, and N^2 are openings in the top plate adapted to be closed by said plates and when in a position with the radial slots in the two lower plates are closed as shown in Fig. 4. Through these slots air is admitted to pass downwardly and discharge upon the fire on the grate and thus supply a quantity of fresh oxygen above the grate to produce perfect combustion and to prevent smoke, soot, &c. This also produces an indirect draft and causes the products of combustion to pass upwardly first through the outer annular flue, then inwardly above the middle boiler section, then downwardly through the inner annular flue and then inwardly and upwardly through the central flue and when a direct draft is desired the lever that is connected with the upper sliding plate is turned so as to bring the radial slots in the lower plates into coincidence and also open the slots at the top.

T indicates a safety valve, T^2 a steam gage, and T^3 a water gage all of the ordinary construction and applied to said boiler in the usual way.

It is not my purpose to be confined in the construction of my boiler to the specifications as said boiler can be utilized in various ways. I can divide the annular flues radially into halves and by suitable dampers cause the products of combustion to pass upwardly through the front half and downwardly through the rear half of annular flues and pass out at the rear through a pipe opening in the boiler section A. I can also construct my boiler in the usual form by using one circular casing with the usual heads leaving annular spaces divided radially through which I can place annular flue casings divided radially.

Having thus described the construction, arrangement, and combination of the various parts of the device, what I claim as new therein, and desire to secure by Letters Patent of the United States therefor, is—

1. A steam or hot water boiler comprising a series of concentric boiler sections having concentric annular flues between them, a series of vibrating flue scrapers substantially as set forth.

2. A steam boiler comprising a series of concentric boiler sections having concentric annular flues between them, a series of vibrating flue scrapers in combination with dampers substantially as set forth.

JOHN W. HAUGHAWOUT.

Witnesses:
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