

(No Model.)

3 Sheets—Sheet 1.

C. WHEAT. BOILER.

No. 395,603.

Patented Jan. 1, 1889.

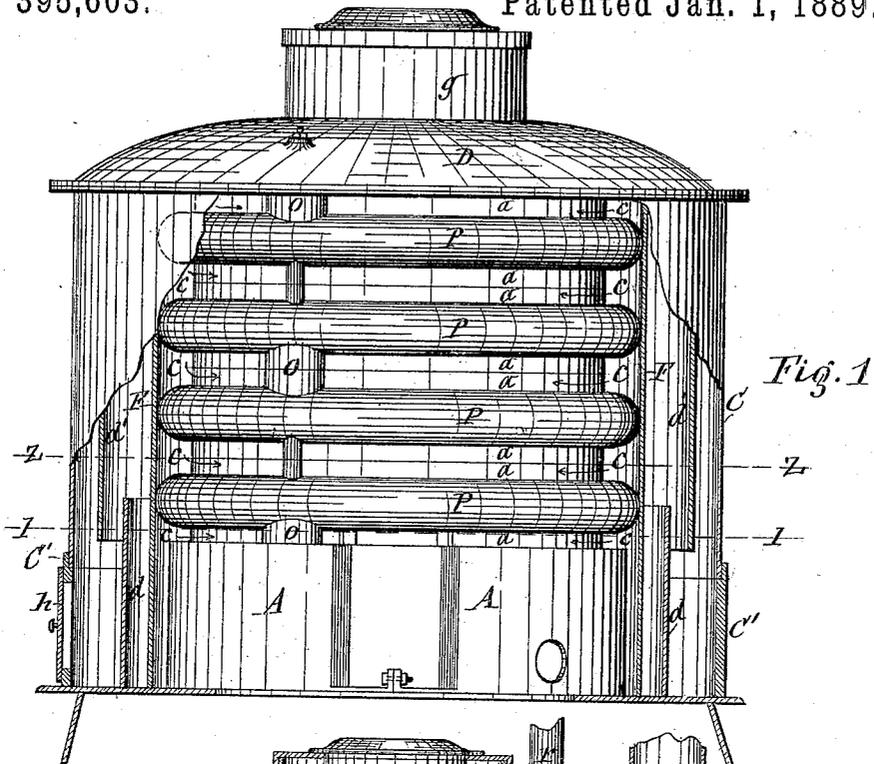


Fig. 1

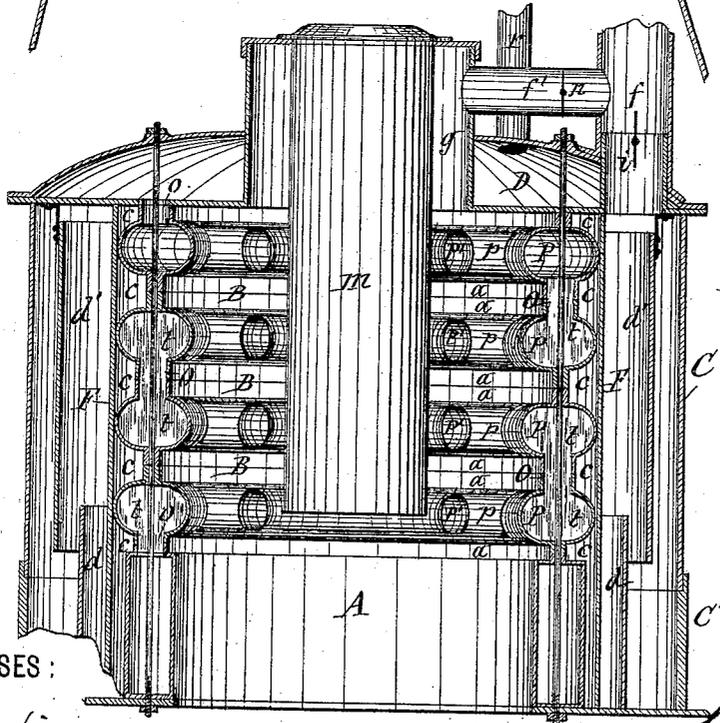


Fig. 4

WITNESSES:

C. Bendixon
A. P. Demisow

INVENTOR

Corydon Wheat
BY *Luella Laess & Smith*
ATTORNEYS

(No Model.)

3 Sheets—Sheet 2.

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BOILER.

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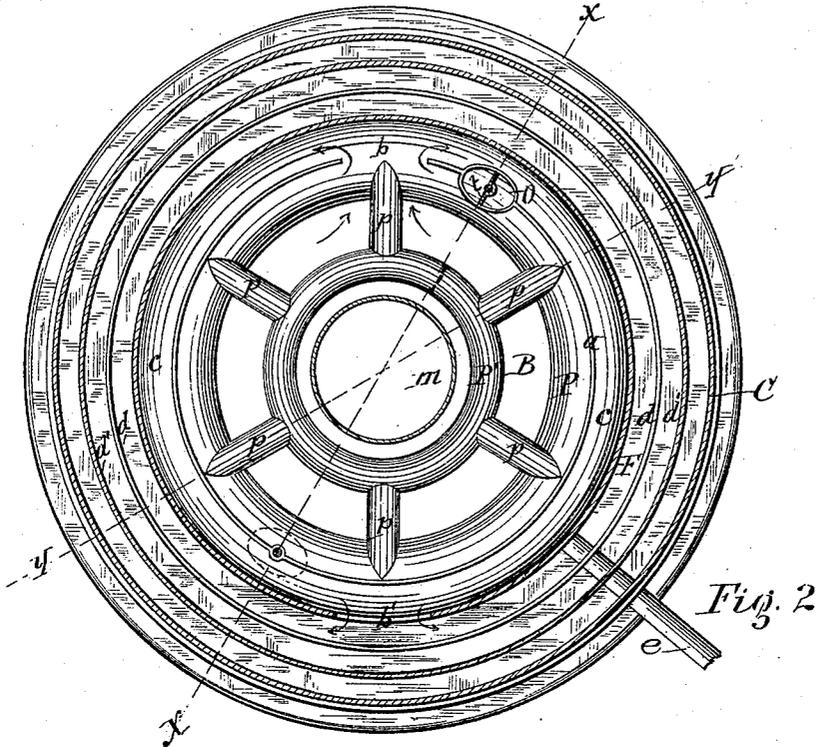


Fig. 2

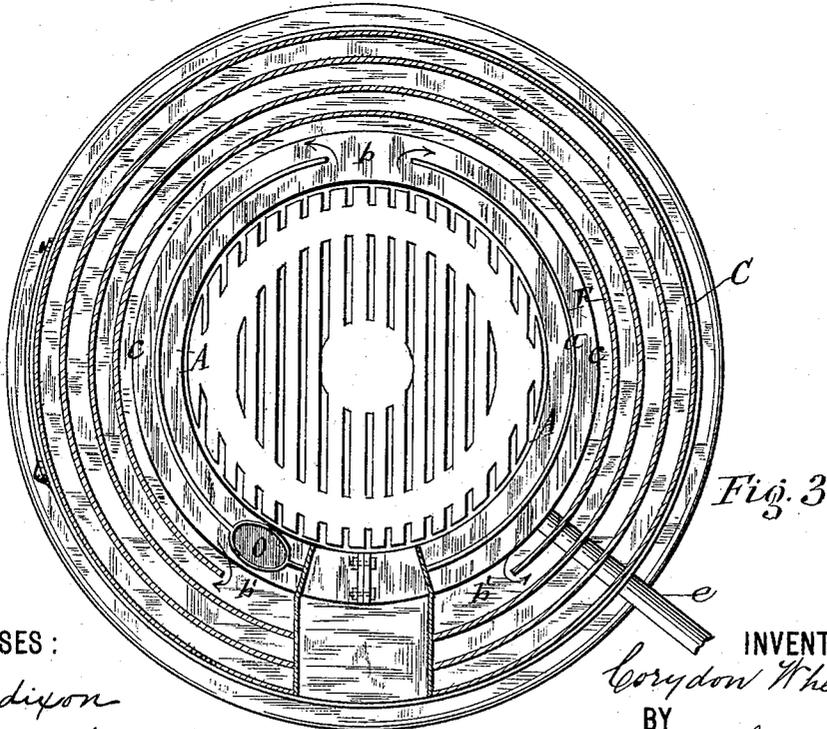


Fig. 3

WITNESSES:

C. Bendixon
A. P. Denison

INVENTOR,

Corydon Wheat

BY

Duell, Lanza & Duell

ATTORNEYS.

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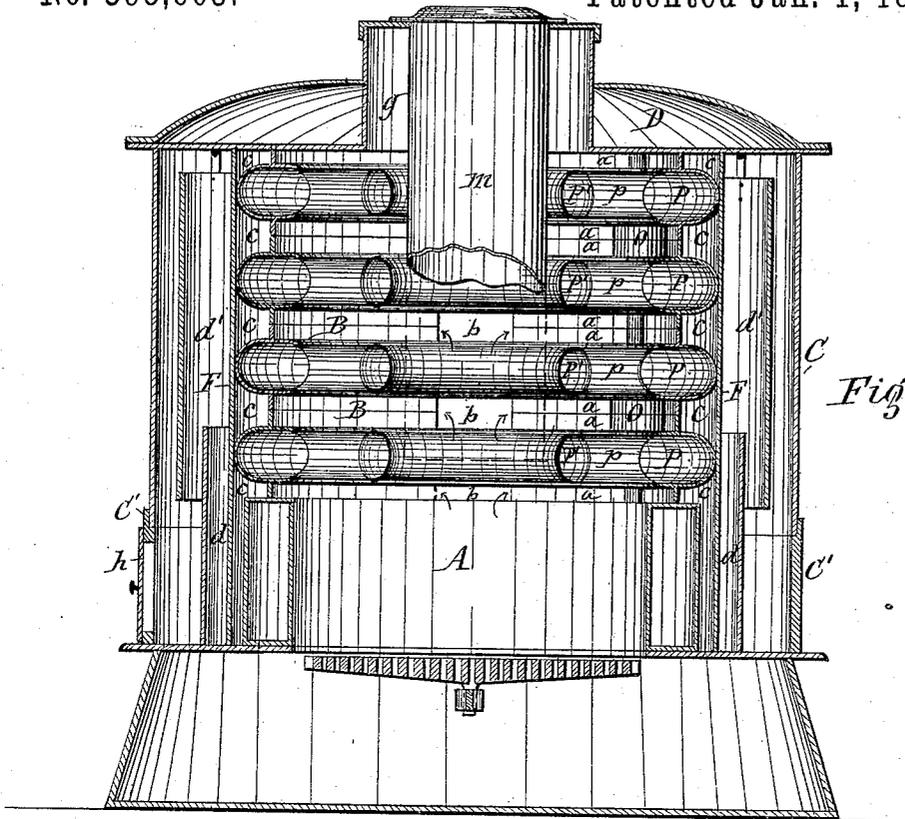


Fig. 5

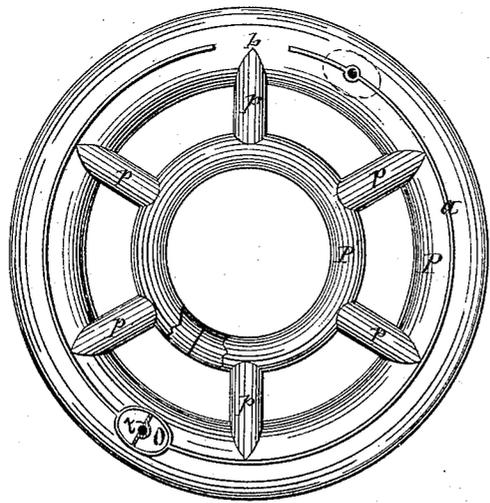


Fig. 6

WITNESSES :

C. Bendixon
H. P. Denison

INVENTOR.

Corydon Wheat.
BY
Hull, Laess & Hull
ATTORNEYS.

UNITED STATES PATENT OFFICE.

CORYDON WHEAT, OF GENEVA, NEW YORK.

BOILER.

SPECIFICATION forming part of Letters Patent No. 395,603, dated January 1, 1889.

Application filed July 14, 1887. Serial No. 244,247. (No model.)

To all whom it may concern:

Be it known that I, CORYDON WHEAT, of Geneva, in the county of Ontario, in the State of New York, have invented new and useful Improvements in Hot-Water and Steam Boilers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of hot-water and steam boilers in which the water-compartment consists of hollow rings arranged horizontally one above the other and above the fire-pot and communicating with each other by vertical ducts or ports between the aforesaid parts; and the invention consists in the improved construction and combination of parts which constitute a hot-water and steam boiler of superior heating capacity with great economy in the consumption of fuel.

The invention is fully illustrated in the annexed drawings, wherein—

Figure 1 is a front elevation of my improved boiler with a portion of the inclosing-case broken away to better illustrate the form of the boiler and its surrounding fire-flues and heat-retaining baffle-plates. Figs. 2 and 3 are horizontal transverse sections respectively on lines *z z* and *l l*, Fig. 1. Figs. 4 and 5 are vertical transverse sections respectively on lines *x x* and *y y*, Fig. 2; and Fig. 6 is a detached plan view of one of the sets of water-heating rings of the boiler.

A represents the fire-pot, the wall of which consists of a hollow annular shell provided with a suitable inlet, *e*, for water. Above this fire-pot and concentric therewith are the water-heating pipes P P P, arranged horizontally one above the other, and above said pipes are arranged the steam-dome D, said pipes being connected with each other and with the hollow fire-pot shell A and dome D by vertical pipes O O O, which are arranged alternately diametrically opposite each other. In such of the pipes O O which are below the water-line of the boiler I arrange vertical partitions *l l*, which extend across the adjacent pipes P P, said partitions serving to divide the ascending current of water from the descending current, each of said currents passing half-way around the successive pipes and causing a perfect circulation of the water in the boiler.

P' P' P' denote annular water-heating pipes of smaller circumference than the pipes P P

P aforesaid, and arranged inside the same and concentric therewith and communicating with the same by radial pipes *p p*. Between the pipes P P, I interpose solid walls *a a*, preferably formed of flanges cast integral with the said pipes. Around the exterior of the pipes P P, I place a shell which is in direct contact with the exterior of said pipes and forms between the same, and also around the exterior of the fire-pot A, separate smoke-flues *c c c*. By the pipes P P, with their walls *a a*, a perfect combustion-chamber, B, is formed over the fire-pot A, and with this combustion-chamber the flues *c c* are made to communicate by ports *b b* through the walls *a a* at one side of the combustion-chamber.

The flues *c c* are provided with ports *b' b'* at points diametrically opposite the ports *b b*, as shown in Figs. 2 and 3 of the drawings.

C represents the inclosing-case, which forms a smoke-jacket around the flues *c c*, and in this smoke-jacket I place annular baffle-plates *d d'*. The baffle-plate *d* rises from the base of the smoke jacket or case C and extends part way the height of the same. The baffle-plate *d'* is of a greater diameter than the baffle-plate *d* and suspended from the top of the smoke-jacket, and has its lower end terminated below the top of the baffle-plate *d*, said baffle-plates serving to prevent radiation of heat outward from the case C, and, by the retention of heat in the combustion-chamber B and flues *c c*, the heating capacity of the boiler is greatly augmented.

In order to permit of cleaning the aforesaid smoke jacket or case C, I form said case with a cast-iron base, C', which I provide with a door, *h*, and the baffle-plate *d*, I mount loosely on the top of the ash-pit, so as to permit of raising the said baffle-plate and allowing the soot and ashes to be scraped out from under it and out through the door *h*.

From the top of the smoke jacket or case C projects upward the exit-flue *f*, provided with a damper, *i*, and from the top of the combustion-chamber B rises an annular flue, *g*, which is extended through the dome D and some distance above the same, and from this flue to the aforesaid flue *f* is extended a direct exit-flue, *f'*, provided with a damper, *n*. From the top of the flue *g* is suspended the magazine *m*, the lower portion of which is surrounded by the annular pipes P' P' P' and is isolated therefrom.

In the operation of the described boiler the products of combustion ascend from the fire-pot through the combustion-chamber B, and by opening the damper *n* the products of combustion escape through the flues *g* and *f'* to the exit-flue *f*. This affords the direct draft required when first starting the fire. After the fire is fairly under way, the damper *n* is to be closed and the damper *i* to be opened. Then the products of combustion will pass from the combustion-chamber B through the ports *b*, thence circulate around through the flues *c c* and pass out through the ports *b'* into the smoke-jacket C, and from thence escape to the flue *f*. In ascending through the combustion-chamber the products of combustion are caused to effectually impinge the pipes P' P' P' and radial pipes *p p p* and the inner halves of the pipes P P P, and in circulating through the flues *c c c* they are brought into intimate contact with the exterior of the said pipes and of the fire-pot.

r represents the pipe which conducts the steam or hot water to the usual radiators in the apartments to be heated.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the fire-pot and pipes P P P, the walls *a a*, provided with ports *b b*, the annular flues *c c*, formed between the pipes outside of the walls *a a*, ports *b' b'*, leading from the said flues, the case C, inclosing the aforesaid parts, and the exit-flue *f*, extended from said case, substantially as described and shown.

2. In combination with the hollow fire-pot shell and pipes P P P, the supporting-walls *a a*, provided with ports *b b*, separate annular flues *c c*, formed between the pipes outside of the walls *a a*, ports *b' b'*, leading from said flues, baffle-plates surrounding the flues *c c*, the case C, surrounding the baffle-plates, and the exit-flue *f*, extended from the case, substantially as described and shown.

3. In combination with the hollow fire-pot shell and inclosing-case C, the annular water-pipes P' P, of different circumferences and arranged concentric over the fire-pot, pipes O O, connecting the pipes P P with each other and with the fire-pot shell, radial pipes *p p*, connecting the smaller with the larger annular pipes, and the magazine *m*, arranged concentric in the smaller pipes, P', and formed separate from said pipes, substantially as described and shown.

4. In combination with the hollow fire-pot shell A and inclosing-case C, the water-pipes P P, walls *a a*, interposed between said pipes, the dome D, pipes O O O, connecting the pipes P P with each other and with the fire-pot shell and dome, the flue *g*, extending vertically through the center of the dome, the magazine *m*, extending through said flue, and the direct exit-flue *f'*, extended from the flue *g*, substantially as described and shown.

5. In combination with the hollow fire-pot

shell A and inclosing-case C, the pipes P P, arranged one above the other, the dome D, pipes O O, connecting the said pipes with each other and with the fire-pot shell and dome, the walls *a a*, interposed between the pipes P P and provided with ports *b b*, and separate flues *c c* between the pipes and provided with the ports *b' b'* diametrically opposite the ports *b b*, substantially as described and shown.

6. In combination with the hollow fire-pot shell A and inclosing-case C, the pipes P P, arranged one above the other, the dome D, pipes O O, connecting the said pipes with the fire-pot shell and dome, walls *a a*, interposed between the pipes P P and provided with ports *b b*, separate flues *c c* between the pipes P P, outside of the walls *a a*, and provided with ports *b' b'* diametrically opposite the ports *b b*, and the baffle-plates *d d'* between the flues *c c* and case C, substantially as described and shown.

7. In combination with the hollow fire-pot shell A and inclosing-case C, the water-pipes P P and P' P', of different circumferences and arranged concentric over the fire-pot, radial pipes *p p*, vertical pipes O O, dome D, flue *g*, extending vertically through the dome, magazine *m*, separate from the pipes P' P' and extending through the flue *g*, walls *a a* between the pipes P P and provided with ports *b b*, separate flues *c c* between the pipes at the outside of the aforesaid walls and provided with the ports *b' b'* diametrically opposite the ports *b b*, the exit-flue *f*, provided with the damper *i*, and the direct exit-flue *f'*, extended from the flue *g* to the flue *f* and provided with the damper *n*, substantially as described and shown.

8. The combination, with the horizontal pipes P P and vertical pipes O O, connecting said horizontal pipes, of the partitions *t t*, extending through the pipes O O and across the pipes P P, substantially as described and shown.

9. The combination of the horizontal pipes P P, arranged one above the other, the vertical pipes O O, connecting the horizontal pipes alternately at diametrically-opposite points, and partitions *t t*, extending through the vertical pipes and across the horizontal pipes, substantially as and for the purpose set forth.

10. In combination with the fire-pot A, pipes P P, and flues *c c*, around said pipes, the case C, having the base C', provided with the door *h*, and the baffle-plate *d*, adapted to be lifted from the bottom of the case, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Geneva, in the county of Ontario, in the State of New York, this 11th day of July, 1887.

CORYDON WHEAT. [L. S.]

Witnesses:

W. H. VROOMAN,

A. S. HINCKLEY.