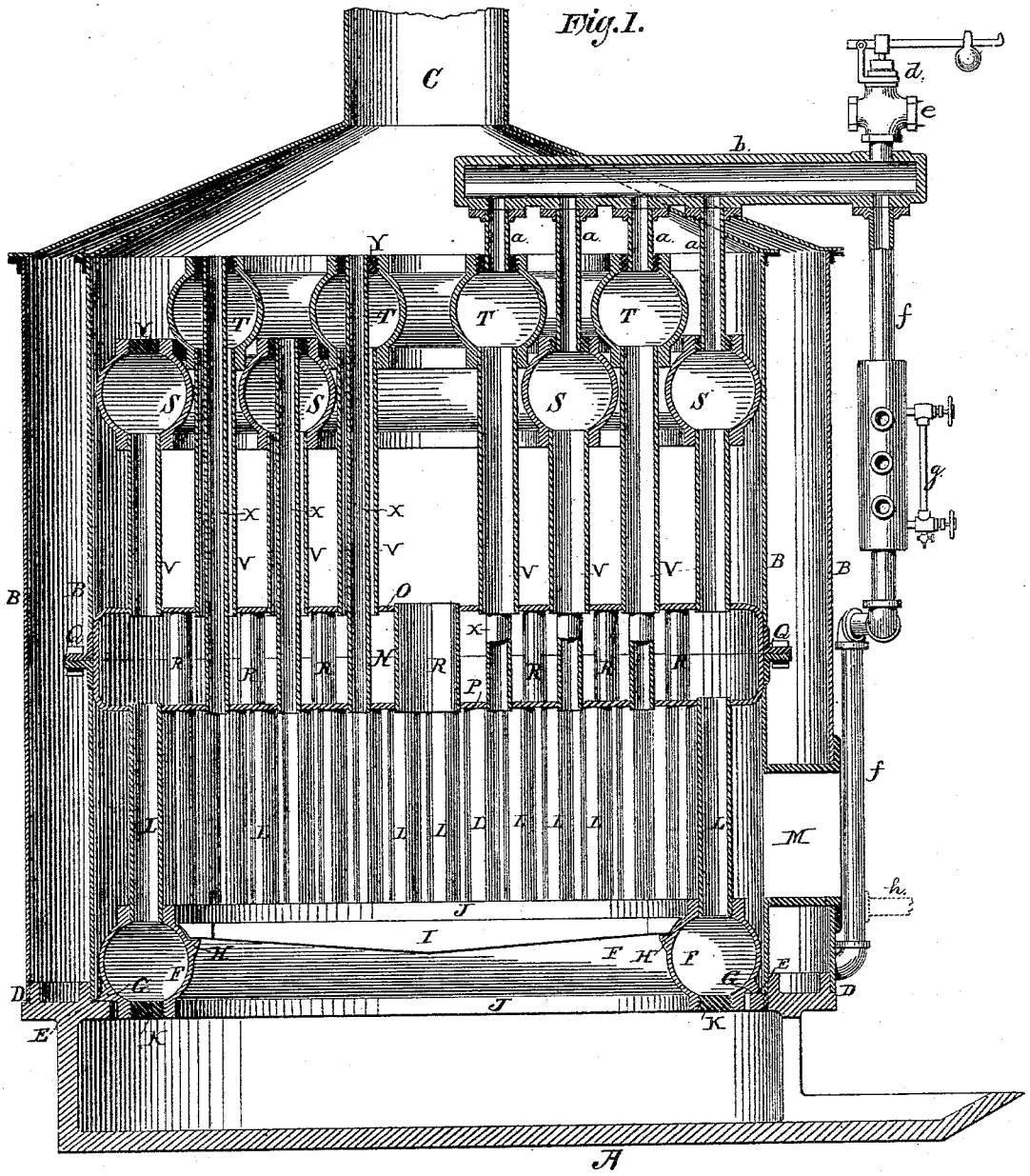
(No Model.) 2 Sheets—Sheet 1.

J. A. GROSHON.

SECTIONAL STEAM BOILER.

No. 384,313. Patented June 12, 1888.

Fig. 1.



WITNESSES:

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(No Model.) 2 Sheets—Sheet 2.

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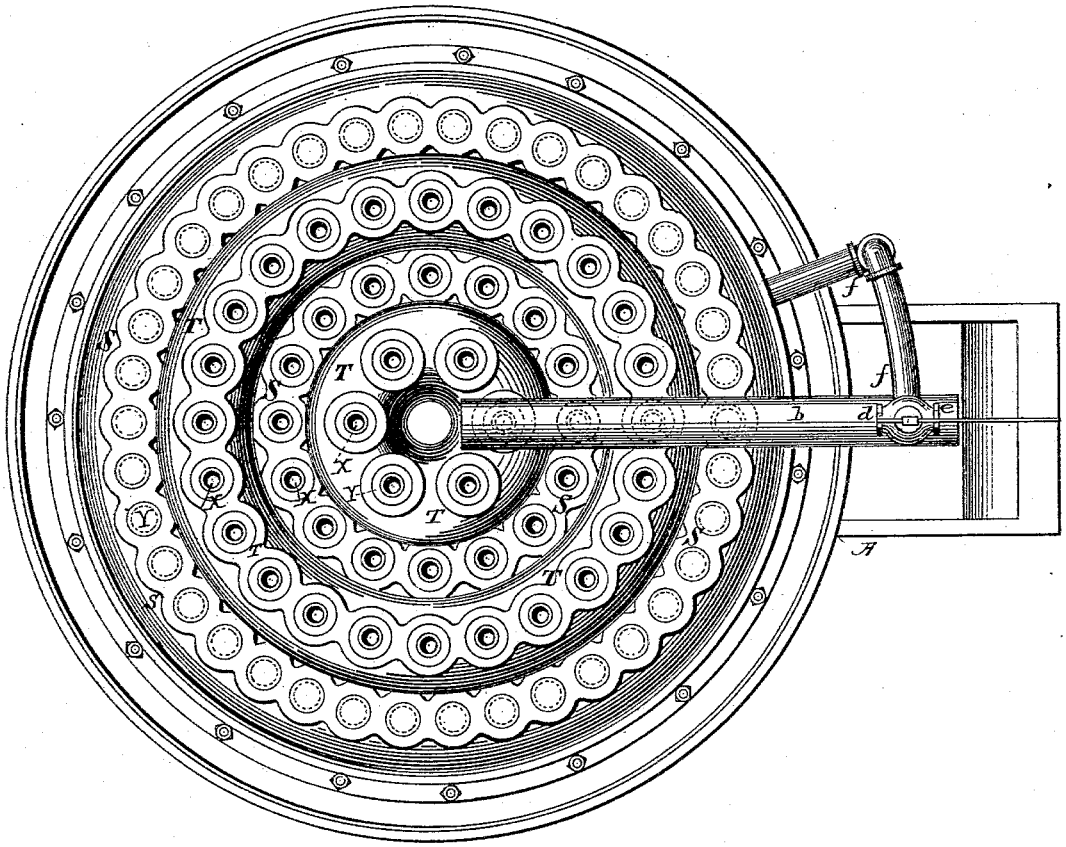
Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN A. GROSHON, OF NEW YORK, N. Y.

SECTIONAL STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 384,313, dated June 12, 1888.

Application filed October 15, 1887. Serial No. 252,466. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. GROSHON, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sectional Steam-Boilers, of which the following is a specification.

The invention relates to improvements in sectional boilers; and it consists in the construction hereinafter described, and particularly pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a central vertical longitudinal section through a boiler constructed according to the invention, and Fig. 2 is a top view of the same.

In the drawings, A indicates the base of the boiler, and B B the double casing inclosing the same and terminating at its upper portion in the smoke-stack C. The base A is circular in general outline and is provided around its upper edge with the shoulders D E, respectively, supporting the lower edges of the double casing B B, and also the circular pipe F, which has the shoulder G resting upon the shoulder E, and is provided with the shoulders H, which support the grate-bars I, as indicated in Fig. 1. The upper and lower surfaces of the circular pipe F are provided with the flattened portions J, that at the lower side of the circular pipe being provided with screw-plugs K, while the flattened portion upon the upper side of the circular pipe F is provided with apertures adapted to receive the lower end of the series of pipes, L, which are arranged in the form of a circle and constitute the walls of the fire-box, a doorway, M, being provided for the admission of fuel. The upper ends of the series of vertical pipes L enter the water-chamber N, formed between the plates O P, which are circular in outline and secured together by angle-plates and bolts Q and constitute the top of the fire-box, said plates covering the full diameter of the boiler and occupying about the transverse center of the same. The plates O P are also connected with each other by the pipes R, which pass entirely through the water-chamber N and permit the passage through them of the products of combustion ascending from the fire-box. The pipes R are conveniently distributed and serve to preserve the relation of the plates O P to each other and strengthen the structure.

In the upper part of the casing B B are arranged the alternating series of circular pipes, lettered S T, respectively, the pipes T being above the pipes S and arranged in close relation to the same, whereby the top portion of the boiler is rendered compact, all available space being occupied and leaving a central draft space within the circle of the inner pipe. Each of the pipes S T is connected with the water-chamber N by the vertical pipes V, and each has flattened upper and lower surfaces for the reception of the said vertical pipes and the plugs Y, illustrated in Fig. 1, and referred to hereinafter.

All or any number of the vertical pipes V may be arranged to inclose the vertical flues or pipes X, extending upward from the fire-box through the water-chamber N into the pipes V, and terminating at the upper side of the circular pipes T, as illustrated in Fig. 1, being there secured by the plugs Y. The purpose of the pipes X is to permit the passage of the products of combustion upward through the water-chamber, the pipes V and circular pipes S T, thence escaping to the smoke-stack C.

In the drawings I have illustrated at the left-hand side of Fig. 1 three of the pipes V, containing the inclosed pipes X. It will be obvious, however, that any number of the pipes X may be employed according to the surface area desired. The circular pipes S T, in addition to being in communication with the chamber N, are connected by vertical pipes *a* with the steam-dome *b*, which is provided with a suitable safety-valve, *d*, and an escape, *e*, for the steam. The steam-dome *b* is connected with the water-leg *f*, which extends downward to the circular pipe F at the lower portion of the fire-box, the said leg *f* being provided with a suitable gage, *g*, and being in connection at its lower end with a suitable pipe, *h*, through which water may be fed to the boiler.

In the operation of the invention the water is introduced through the pipe *h* and pipe *f* to the circular pipe F, whence it ascends through the circular series of pipes L into the water-chamber N, filling around the pipes R and

thence ascending through the pipes V up to about the lower portion of the circular pipes S. The fire being upon the grate-bars I, the water in the circular pipe F, pipes L, and water-chamber N will be quickly heated by the direct contact of these parts with the fire, and at the same time the products of combustion will ascend through the pipes R and pipes X, that ascending through the pipes R circulating around and among the pipes V and circular pipes S T, thereby heating the same, while the products of combustion which pass upward through the pipes X act upon the water in the pipes V and also increase the temperature in the circular pipes S T. Thus the water in the pipes above the water-chamber N is heated by the passage of the products of combustion around the outside of said pipes as well as through the center of the same. The steam generated by the heating of the water passes through the pipes *a* into the steam-dome *b*, whence it is led away by any suitable connection at *e*. By the arrangement of the pipes as above described I obtain a very effective heating-surface, the area of which may be regulated at will, according to circumstances, by the number of pipes made use of.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a boiler, the plates O P, forming the water-chamber and being at the top of the fire-box, combined with the circular pipe at the lower portion of the fire-box, a series of pipes connecting the said pipe and chamber and forming the walls of the fire-box, a series of circular pipes at the top of the boiler, an exit therefrom for steam, and a series of pipes connecting the said series of circular pipes with the said water-chamber, substantially as and for the purposes set forth.

2. In a boiler, the plates located at the top of the fire-box and forming between them the water-chamber, combined with the pipe at the lower portion of the fire-box, a series of pipes connecting said pipe and said chamber and forming the walls of the fire-box, a series of circular pipes at the top of the boiler, an exit therefrom for steam, a series of pipes connecting the said series of circular pipes with said water-chamber, and flue-pipes for the products of combustion extending through said water-chamber, substantially as set forth.

3. In a boiler, the plates located at the top of the fire-box and forming between them the water-chamber, combined with the pipe at the lower portion of the fire-box, a series of pipes connecting said pipe and said chamber and forming the walls of the fire-box, a series of circular pipes at the top of the boiler, an exit therefrom for steam, a series of pipes connecting the said series of circular pipes with said water-chamber, flue-pipes extending through said water-chamber, and flue-pipes passing upward from the fire-box through the said vertical pipes which connect the said series of circular pipes with the said water-chamber, and through the circular pipes at the top of the boiler, substantially as and for the purposes set forth.

4. In a boiler, the plates located at the top of the fire-box and forming between them the water-chamber, combined with the pipe at the lower portion of the fire-box, a series of pipes connecting said pipe and said chamber and forming the walls of the fire box, a series of circular pipes at the top of the boiler, a series of pipes connecting the said series of circular pipes with said water-chamber, flue-pipes extending through said water-chamber, a steam-dome with its escape and safety valve, and pipes connecting the steam-dome with the said series of circular pipes, substantially as and for the purposes set forth.

5. In a boiler, the plates located at the top of the fire-box and forming between them the water-chamber, combined with the pipe at the lower portion of the fire-box, a series of pipes connecting said pipe and said chamber and forming the walls of the fire-box, the series of alternating circular pipes S T at the top of the boiler, an exit therefrom for steam, a series of pipes connecting the said series of circular pipes with said water-chamber, and flue-pipes for the products of combustion extending through said water-chamber, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 13th day of October, A. D. 1887.

JOHN A. GROSHON.

Witnesses:
CHAS. C. GILL,
W. A. C. MATTHIE.