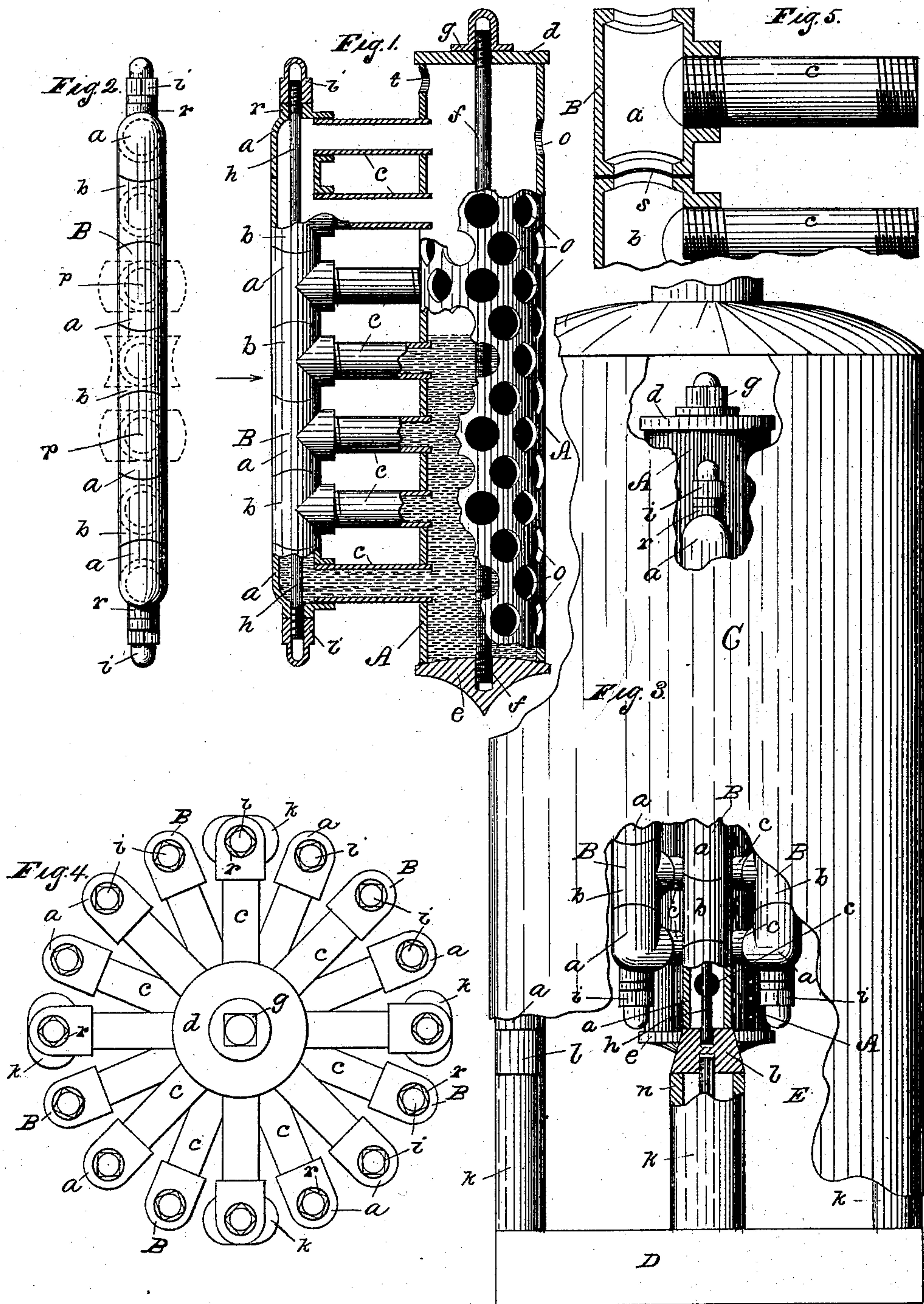


(No Model.)

S. BRAGGINS.
STEAM BOILER.

No. 410,309.

Patented Sept. 3, 1889.



Attest:
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UNITED STATES PATENT OFFICE.

SETH BRAGGINS, OF ROCHESTER, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 410,309, dated September 3, 1889.

Application filed May 9, 1889. Serial No. 310,165. (No model.)

To all whom it may concern:

Be it known that I, SETH BRAGGINS, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Steam-Boilers, which improvement is fully set forth in the following specification, and shown in the accompanying drawings.

My invention relates to that class of steam-boilers or steam-generators known as "sectional boilers;" and the invention consists more especially in the form and arrangement of the sections and their connection with the other parts of the boiler. The boiler consists, essentially, of a central upright cylindrical part or body surrounded by vertical pipes, the latter being each composed of several sections, each connected by a horizontal tube with the central body. The sections of the surrounding pipes are constructed to abut together at their ends, (separated only by thin gaskets,) the ends of the sections being curved. The construction of the sections is such that any one, with its connecting-tube, may be removed from its place in the boiler and replaced without removing the adjacent sections.

Referring to the drawings, Figure 1 shows a side elevation of portions of the steam-boiler, parts being centrally and vertically sectioned, many parts being omitted; Fig. 2, a view of a vertical pipe, seen as indicated by arrow *x* in Fig. 1, some of the sections being shown in two positions by full and dotted lines. Fig. 3 is a side elevation of the boiler, parts of the jacket being broken away and a part of one of the side pipes with associated parts vertically sectioned. Fig. 4 is a view of parts of the boiler, seen from a point overhead, the jacket and other parts being omitted. Fig. 5, drawn to an enlarged scale, better shows the interior form of the sections and the joints between them.

Referring to the parts shown in the drawings, A is the central cylindrical part or body of the boiler, and B the side pipes surrounding the body A, each pipe being composed of sections *a b* alternated. These pipes are preferably placed equidistant from the central body A, and each section is connected with said central body by a short tube *c*, to the end that a free circulation of water or steam may

occur through all the parts. The body A is provided with an upper head *d* and a lower head *e*, the two being held to place by a bolt *f*, preferably threaded into the lower head and provided with a tightening-nut *g* above the upper head. The vertical pipes B have central bolts *h* extending through them, these bolts, with some exceptions, being provided at their respective ends with tightening-nuts *i*.

This steam-generator is designed more particularly to be heated with an atomized fuel, as a hydrocarbon; but any fuel, as wood or coal, may be employed in the usual manner.

The space within the body A and the surrounding pipes and tube-connections constitute the steam and water space of the generator, a free circulation being had through all said parts. Some suitable jacket C is provided to surround the generator proper, as shown in Fig. 3.

As usually constructed, I support the generator upon hollow pedestals *k*, the latter resting upon a hollow base D. These pedestals are equally spaced, they being placed, respectively, directly beneath the lower ends of the vertical pipes B, as shown in Figs. 3 and 4.

When used for other purposes than for a marine boiler, a communication is made between the space within the generator and that within the base D through the hollow pedestal *k*, the space within said pedestal and base constituting in such cases additional water-space for the generator. When used as a marine boiler, imperforate dividing-blocks *l* are employed to separate the pipes B and the associated pedestals. When these separating-blocks are employed, they are held to their respective pedestals and the latter to the base D by bolts *n*, threaded in their under surfaces, the bolts *h*, passing through the superincumbent pipes B, being threaded in the upper sides of said blocks, as shown in Fig. 3. When the construction is such that there is a communication between the pipes and pedestals, as above stated, the bolts *h* in the pipes over the pedestals extend downward to the base D. In case of the other pipes B the bolts *h* terminate at both ends in screw-nuts *i*, as shown and above stated.

The sections *a b*, which constitute the essential part of my invention, are formed with

curved ends, as shown, the ends being curved on the arc of a circle the diameter of which corresponds with the axis of the section. For instance, the curves of the ends of a section *a*, Figs. 2 and 1, are concentric with the axis *p* of its connecting-tube *c*, which axis cuts the axis of the section at right angles, and the adjacent concave ends of the two contiguous sections *b b* are also concentric with this axis.

Now, on account of this form or character of the curves of the ends of the sections these sections may be placed so as to abut together in a column to form a pipe B, as shown, each being connected with the central body A by its tube *c*. The latter are each permanently secured to its section, so that the tubes may be screwed into or out of the body A, the holes *o* and the ends of the tubes being threaded for the purpose. In putting these sections together to form a pipe B, the sections *b* are first put to place by screwing the ends of the respective tubes *c* into the holes in the body A, these holes being formed in vertical rows and threaded to a gage. Then the sections *a* are turned into their places, this being permitted on account of the form of the curves of the ends of the sections, as stated. When necessary, any one of the sections *a*, with its connecting-tube *c*, may be removed from the boiler without disturbing the rest. To remove a section *b*, the contiguous sections *a* are first turned through one-fourth of a revolution, so as to stand at right angles with the pipe, as shown by dotted lines in Fig. 2. The section *b* may then be readily turned between them and removed. When the ends of the sections are thus truly curved and the sections made of the proper length, they form tight joints with each other when put together in a column to form a pipe and are pressed together by the bolt *h*. Usually, however, before the bolt is tightened I spring the sections apart and insert between the contiguous ends thin copper gaskets *s*. The upper and lower sections *a a* of each pipe are made in the form of elbows, each being provided with a seat *r* for the tightening-nuts *i*. The bolt *h*, it will be understood, has to be removed before a section can be turned, as stated.

As shown in Fig. 1, the water-line is just above the fourth tube *c* from the bottom, which may be regulated at pleasure. The space above is for the steam, the latter being taken out through an orifice *t* to the engine.

The usual gage-cocks are inserted in the sections of one of the pipes B. The sections I prefer to make cylindrical and of uniform diameter, as shown. They may, however, be oval in cross-section or of other form.

E, Fig. 3, is the fire-space. The lower head of the body A is made pointed or conical at its under surface to deflect the upward currents of heat toward the pipes B. The ascending heat sifts through the interstices between the tubes *c*, which tubes, together with the pipes B and body A, present a large surface to the action of the heat. The shells or walls of the sections are made thicker at the ends for the purpose of affording a broader surface to form the joints between them, the feature being clearly shown in Fig. 5.

What I claim as my invention is—

1. A steam-generator having hollow sections connected to form a pipe, said sections being formed with circular faces, respectively concave and convex, as shown, to allow of a rotating movement, for the purpose set forth.

2. In a steam-boiler, a central body, in combination with hollow sections arranged to form pipes at the side of said central body, and connecting-tubes for said sections and central body, substantially as shown.

3. A sectional steam-boiler having hollow sections connected to form a pipe, one section having convex ends and the adjacent section having concave ends, substantially as shown and described.

4. A steam-generator having hollow sections connected at their ends, said sections being formed with circular faces, respectively concave and convex, and having the shell or wall at the ends made thicker than at the middle parts thereof, substantially as described.

5. A steam-boiler consisting of a hollow base, hollow pedestals, a central body and side pipes, the latter being formed of sections each connected with said central body, the pedestals being placed beneath various ones of said side pipes and forming communications for water between said side pipes and base, substantially as shown.

In witness whereof I have hereunto set my hand this 2d day of May, 1889, in the presence of two subscribing witnesses.

SETH BRAGGINS.

Witnesses:

E. B. WHITMORE,
M. L. McDERMOTT.