(No Model.) 2 Sheets—Sheet 1.

G. P. WILSON.

STEAM BOILER.

No. 408,280. Patented Aug. 6, 1889.

Fig. 1.

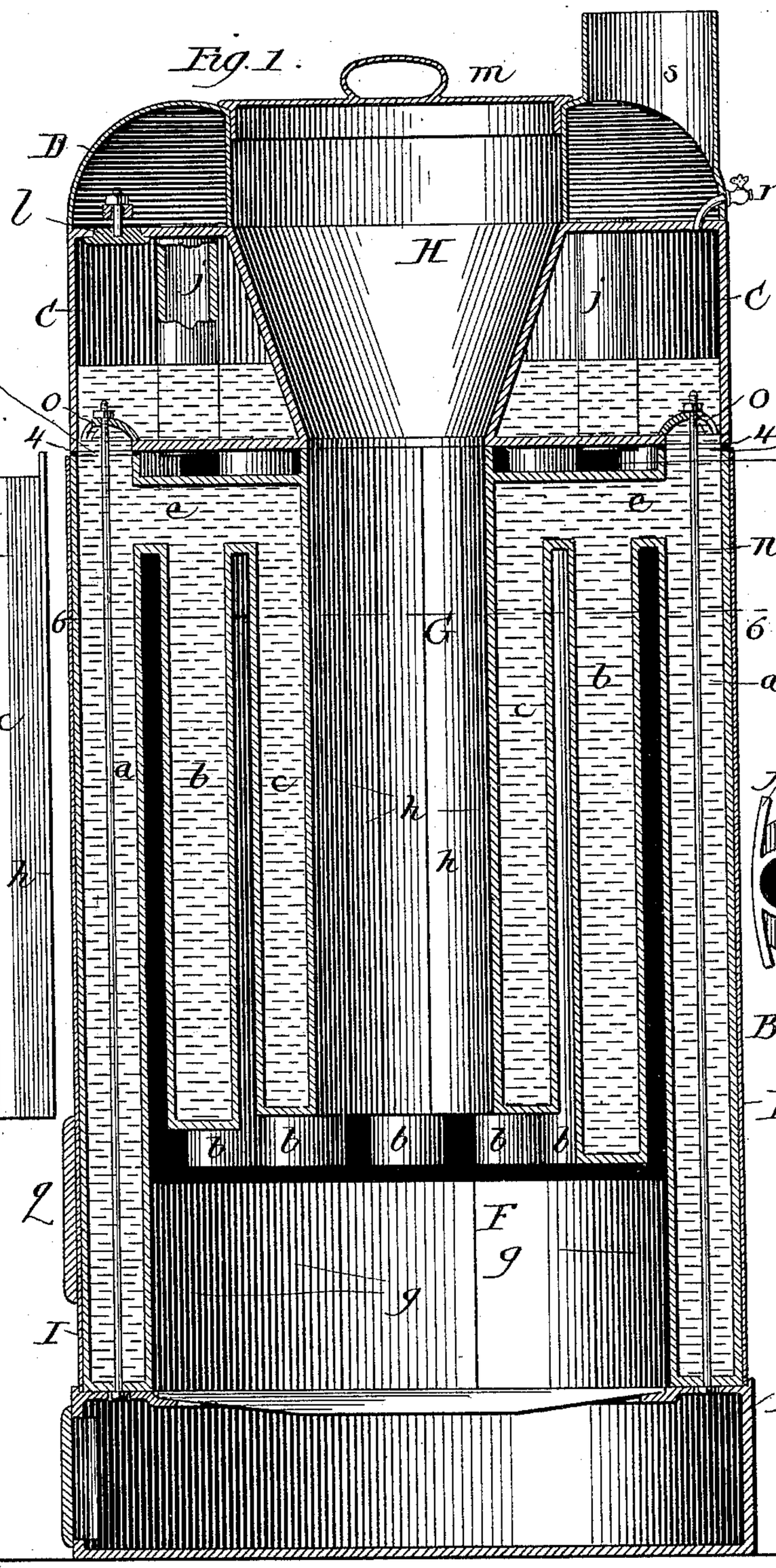


Fig. 2.

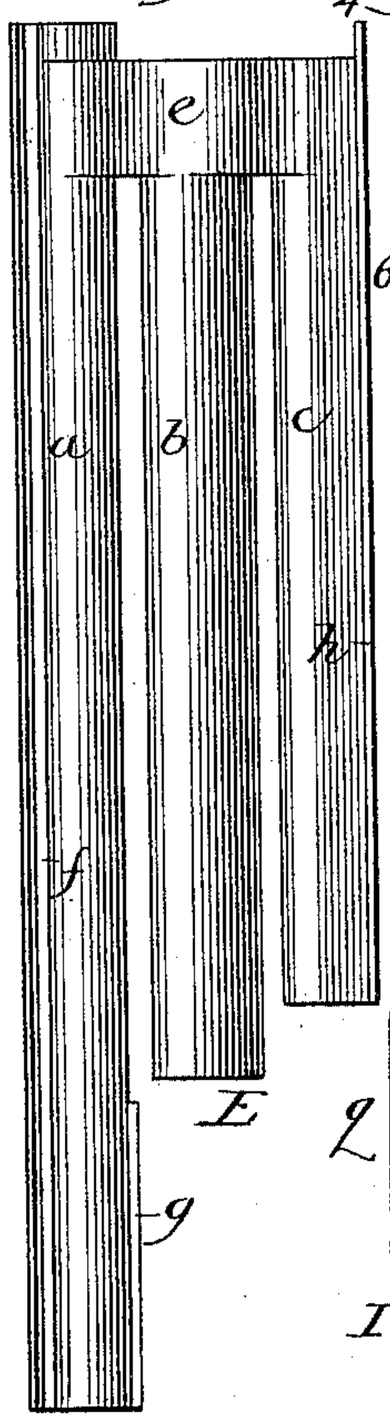
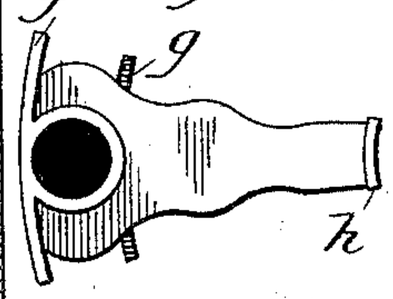


Fig. 3.



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Inventor:
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Attys.

(No Model.) 2 Sheets—Sheet 2.

G. P. WILSON.

STEAM BOILER.

No. 408,280. Patented Aug. 6, 1889.

Fig. 4.

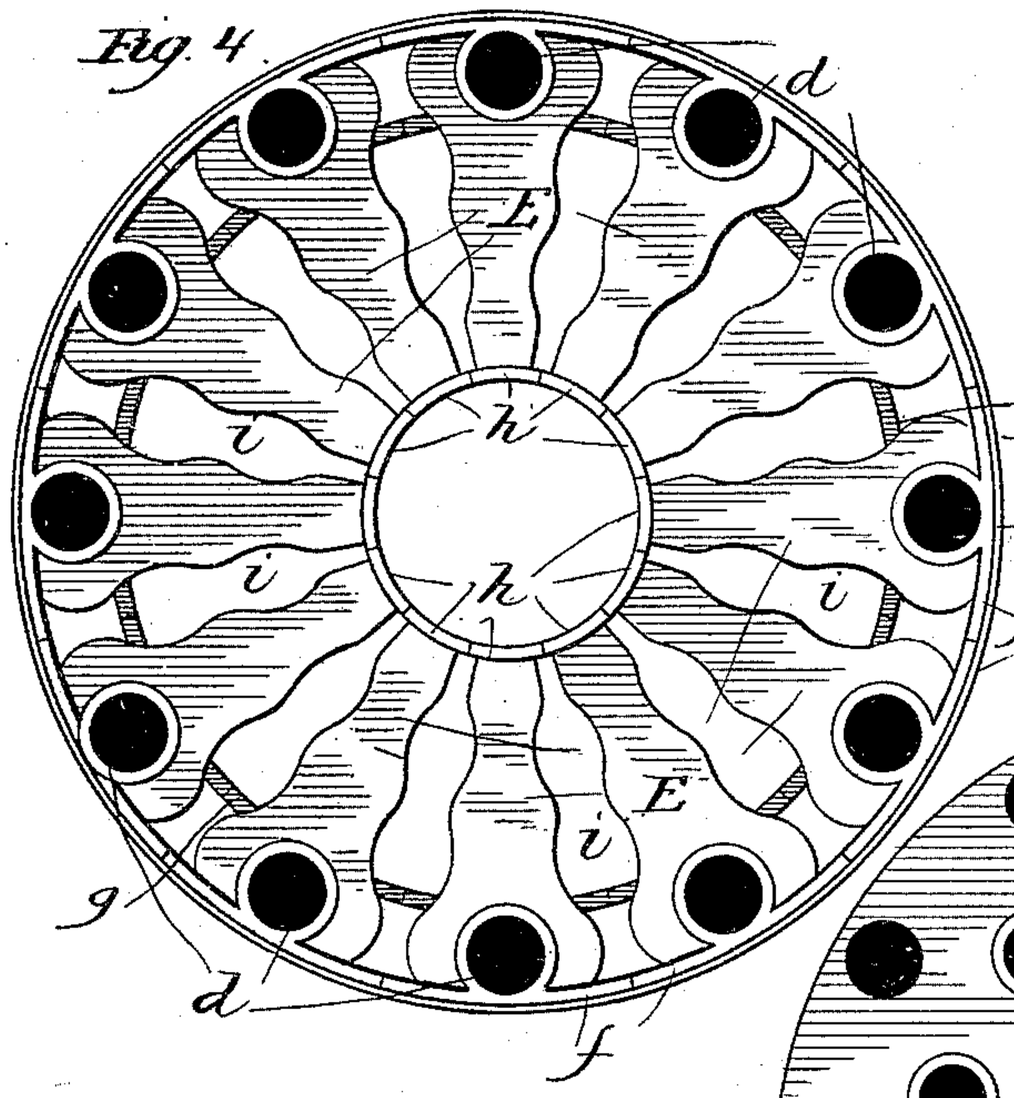


Fig. 7.

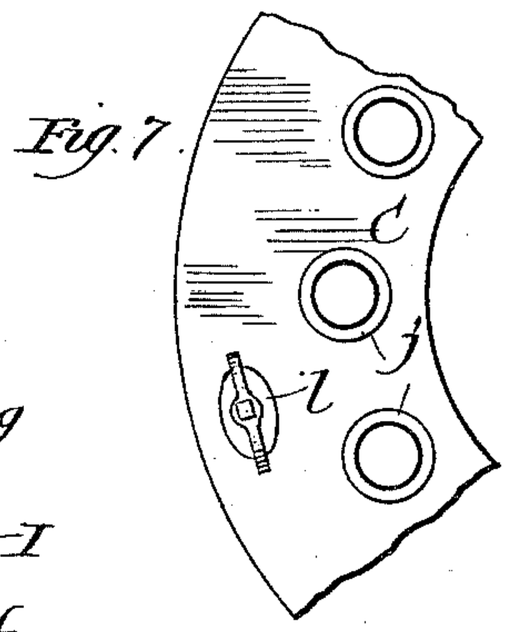


Fig. 5

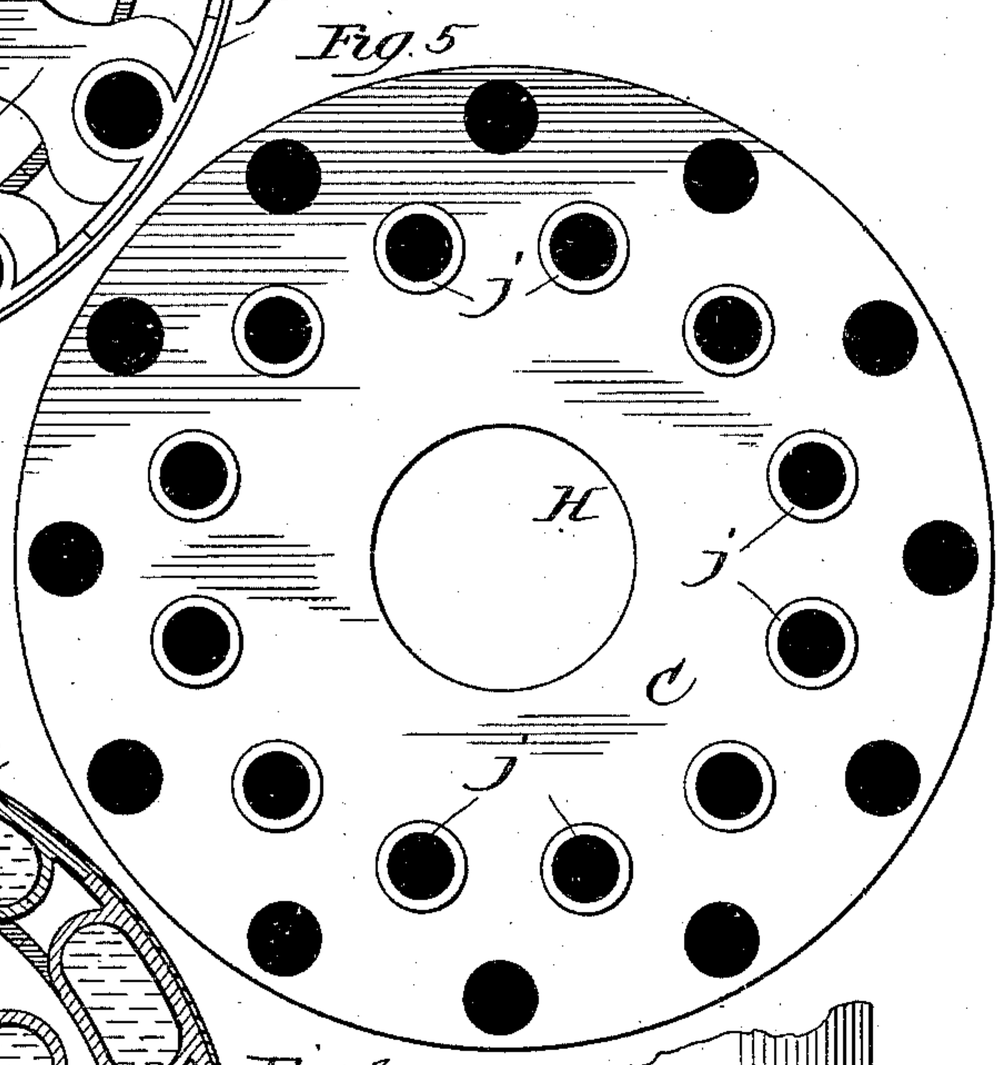


Fig. 6.

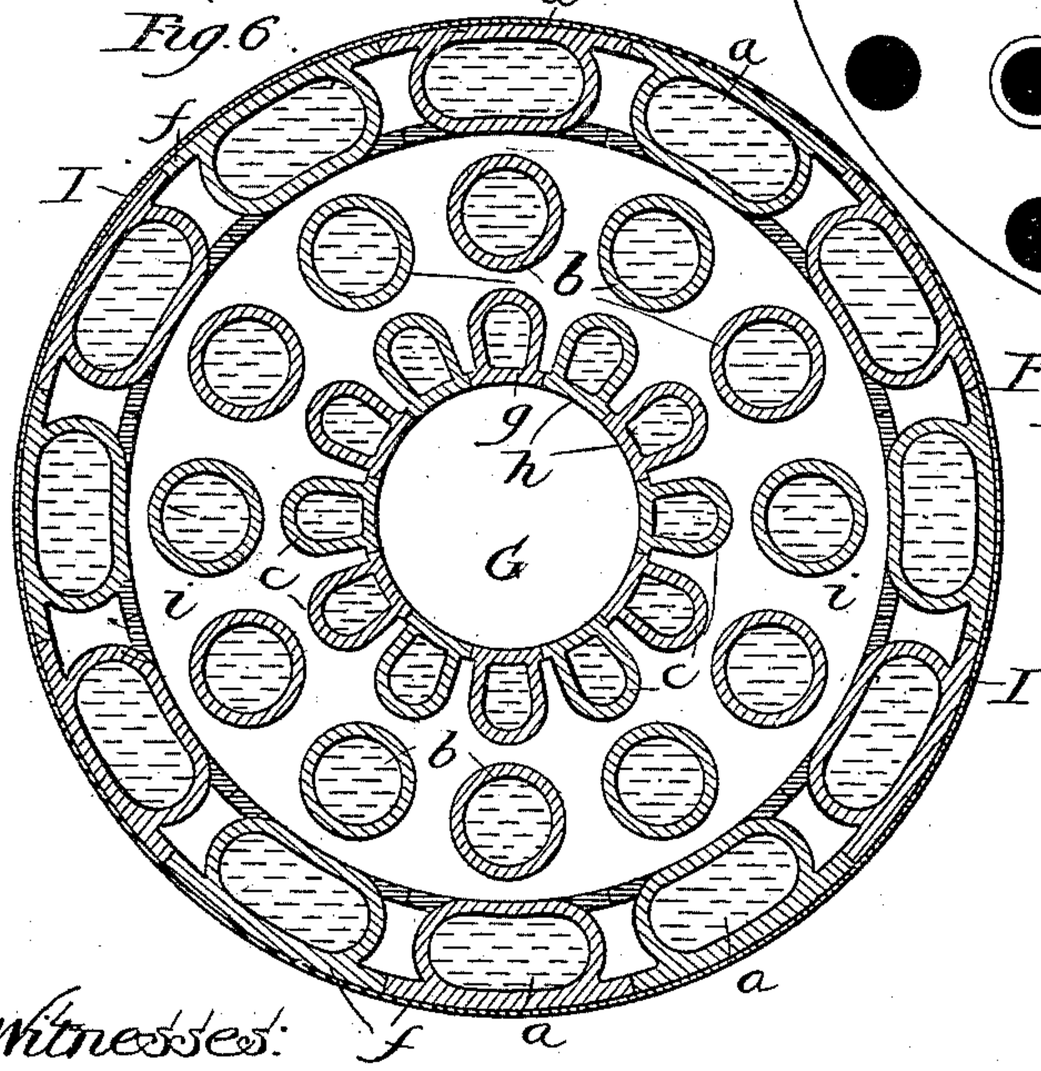
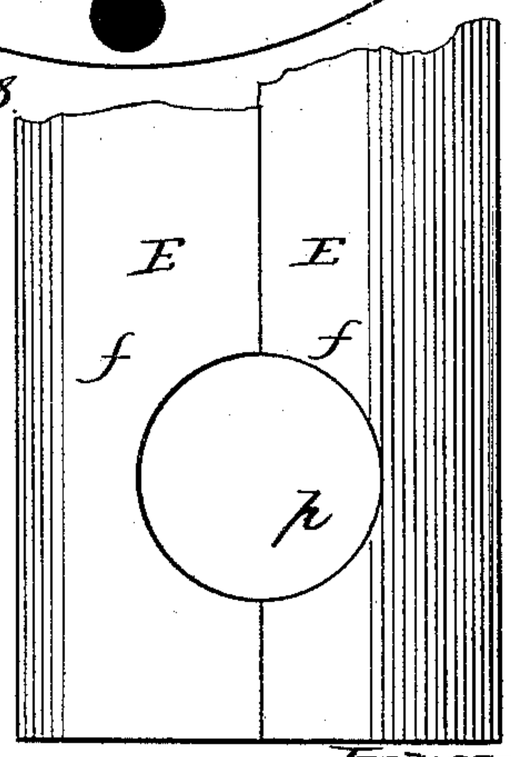


Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE P. WILSON, OF MONROE, WISCONSIN.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 408,280, dated August 6, 1889.

Application filed April 17, 1889. Serial No. 307,632. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. WILSON, residing at Monroe, in the county of Green and State of Wisconsin, and a citizen of the United States, have invented a new and useful Improvement in Steam-Boilers, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section. Fig. 2 is a detail, being a side view of one of the water-tube sections. Fig. 3 is a top view of one of the water-tube sections. Fig. 4 is a plan of that part of the boiler which remains after the upper part has been removed, the dividing-line being at 4 of Fig. 1. Fig. 5 is an under side view of the upper portion of the boiler, the dividing-line being at 4 of Fig. 1. Fig. 6 is a horizontal section at line 6 of Fig. 1. Fig. 7 is a detail, being a plan, showing, among other things, the cover of one of the hand-holes in the upper part of the boiler. Fig. 8 is an enlarged detail showing an opening to give access to the fuel-chamber.

My invention relates to upright boilers. Its leading objects are to provide increased heating-surface without increasing the size of the boiler and without materially adding to the expense thereof, and to improve the construction of the boiler, all of which I accomplish as illustrated in the drawings and hereinafter described.

That which I claim as new will be pointed out in the claims.

The completed boiler may be said to consist of four principal parts—a base A, a main portion B, which is supported by the base, a third part C, which is secured to the upper part of the portion B, and a cap D.

The main portion B consists of a number of sections E. Each section is composed of three water-tubes *a b c*, which are of different lengths and are closed at the bottom. The tube *a* is open at the top. These openings are marked *d* in Fig. 4. The tubes *b c* communicate with each other and with the tube *a*, as shown at *e* in Fig. 1. There is a small space between the tubes *a b* and between the tubes *b c*. Each of these sections E is provided with an outside piece *f*, which extends the whole length of the tube *a*. The lower end of the tube *a* is also provided with an inside piece *g*, (shown in Figs. 2, 3, and 6,) which pieces *f* and *g* are cast with the tube *a*. The edges of the parts *f* of the adjoining sections E come together and form an outer wall. The edges of the parts *g* also come together and form the wall of the fire-chamber. The inner end of each section E is also provided with a piece *h*, the edges of which pieces come together and form the wall of the fuel-magazine G. (Shown in Figs. 1, 2, 3, 4, and 6.) Between the sections E there are spaces *i* for heat and smoke. The parts *f g h* are cast with each section E. The tubes *a* are, as shown, oval, the tubes *b* are, as shown, round, and the tubes *c* are horseshoe in shape, as shown in Fig. 6; but I do not limit myself to these special forms, although they are well adapted to secure the greatest amount of heating-surface.

j are flues for smoke, which flues are connected at their lower and upper ends with the upper and lower portions of the part C of the boiler. This part C forms a water and steam chamber.

Between the chamber C and each section E there is water communication through the openings *d* at the upper ends of the tubes *a*. Between the remaining portions of the sections E and the part C there is a smoke-passage *k*, with which the lower ends of the flues *j* communicate.

In the top of the part C there are three hand-holes *l*, one of which is shown in Fig. 1. These holes are oblong and each is closed, as shown in Figs. 1 and 7.

The cap D covers the upper portion of the part C; but there is a large passage H through this cap and through the central portion of the part C, into which fuel can be introduced when the cover *m* has been removed, which passage is a part of the fuel-magazine. The part C and the several sections E are secured together by means of bolts *n*, which are inserted from below, one of which passes through each tube *a*. The rods are securely held by means of bridges *o* and nuts. Access is had to the interior of the part C through the hand-holes for the purpose of holding the nuts while the bolts are turned by a wrench from below.

After this part C and the sections E have been secured together by the bolts *n* they can be mounted on the base A.

I is a casing or shell of sheet metal, which surrounds the part B of the boiler.

An opening *p* is provided for the purpose of giving access to the fire-chamber, which opening can be closed by a door *q*. This opening is not shown in Fig. 1, because the section is taken directly through the center of the water-tube sections.

In use water can be admitted to the chamber within the part C through a pipe *r*, or in any other suitable manner, and water will pass from such chamber into all the tubes *a b c*. The chamber C is to be only partly filled with water, leaving a space for steam above the water-line, and steam can be taken out from this chamber at any desired point, the steam-outlet not being shown in the drawings.

s is a smoke-pipe.

In use the heat and smoke pass up through the passages between and partly around the water-tubes into the smoke-passage *k*, thence through the flues *j* into the chamber within the cap D and out through the pipe *s*.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a steam-boiler, a series of water-tube sections, each consisting of three tubes *a b c*, communicating with each other, each tube *a* being provided with the parts *f* and *g*, the parts *f* forming an outer wall and the parts *g* forming the wall of the fire-chamber, substantially as and for the purposes specified.

2. In a steam-boiler, a series of water-tube sections, each consisting of three tubes communicating with each other, and each section being provided with the parts *f g h*, substantially as and for the purposes specified.

3. In a steam-boiler, a series of water-tube sections E, in combination with a water-chamber C above, and combined with the tube-sections E, a smoke-passage *k* between the sections E and water-chamber C, a smoke-chamber above the water-chamber, and flues *j*, communicating at their lower ends with the smoke-passage *k* and at their upper ends with the smoke-chamber above the water-chamber C, substantially as and for the purposes specified.

4. In a steam-boiler, a series of water-tube sections E, each provided with an inside piece *h*, which parts *h* form the wall of the lower part of the fuel-magazine, in combination with a fire-chamber F, water-chamber C, smoke-passage *k*, a smoke-chamber above the water-chamber C, flues *j*, which pass through the smoke-chamber C, and a fuel-magazine G H, substantially as and for the purposes specified.

GEORGE P. WILSON.

Witnesses:
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E. C. COPELAND.