

J. LAPP.
STEAM BOILER.

No. 494,211.

Patented Mar. 28, 1893.

Fig. 1.

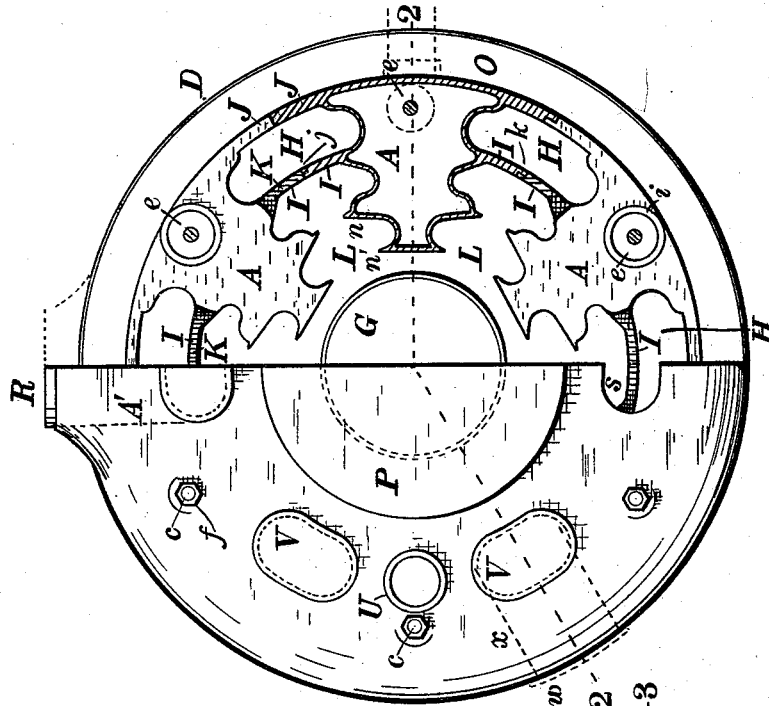
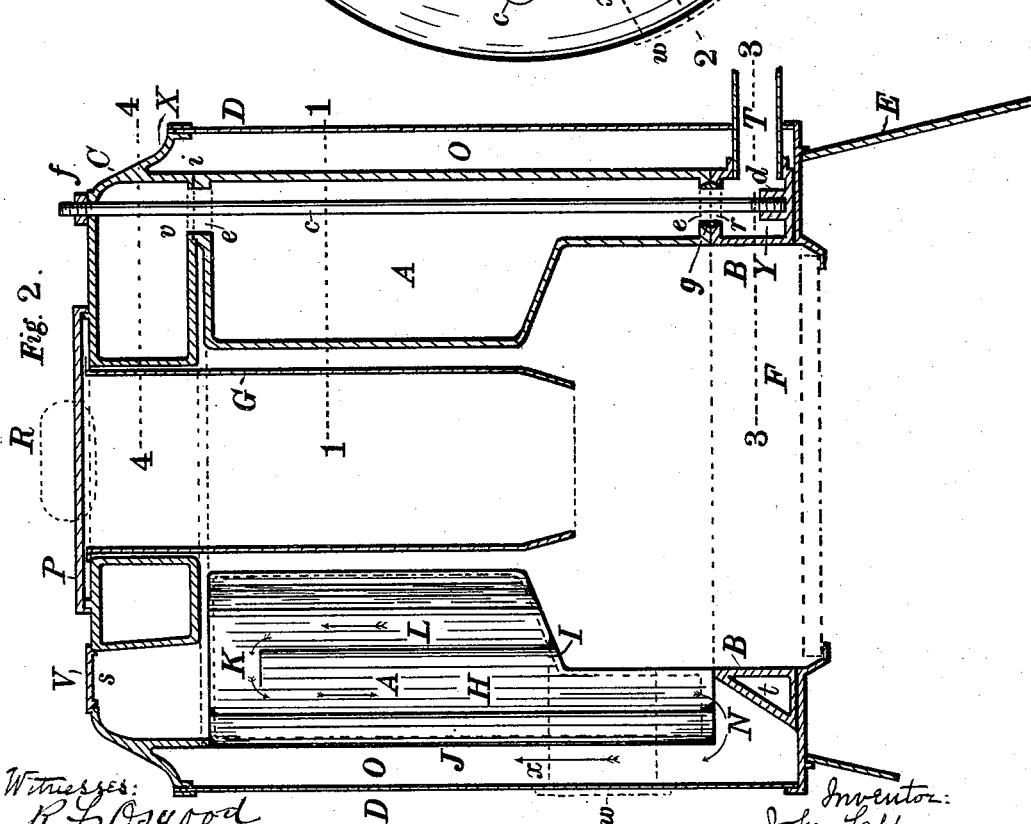


Fig. 2.



Witnesses:
R. F. Osyood
C. F. Crumwell.

Inventor:
John Lapp.
By Geo. B. Selden,
Att'y.

J. LAPP.
STEAM BOILER.

No. 494,211.

Patented Mar. 28, 1893.

Fig. 3.

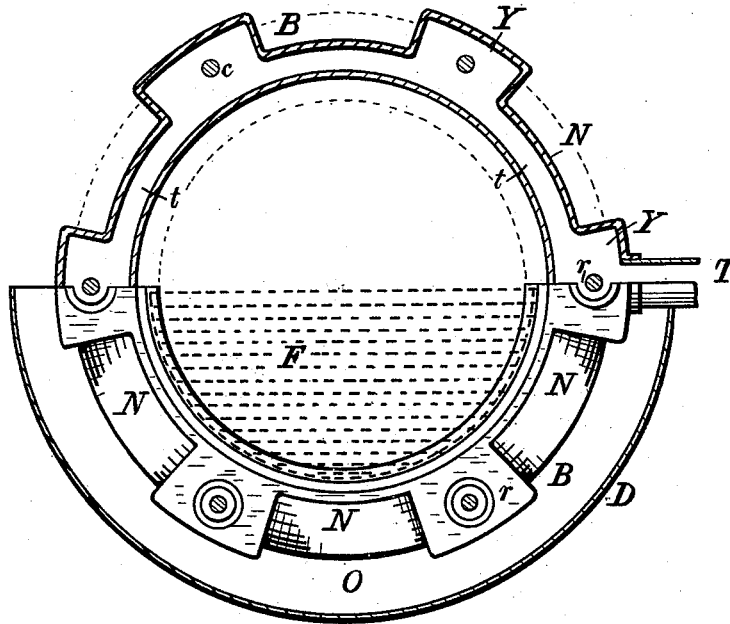
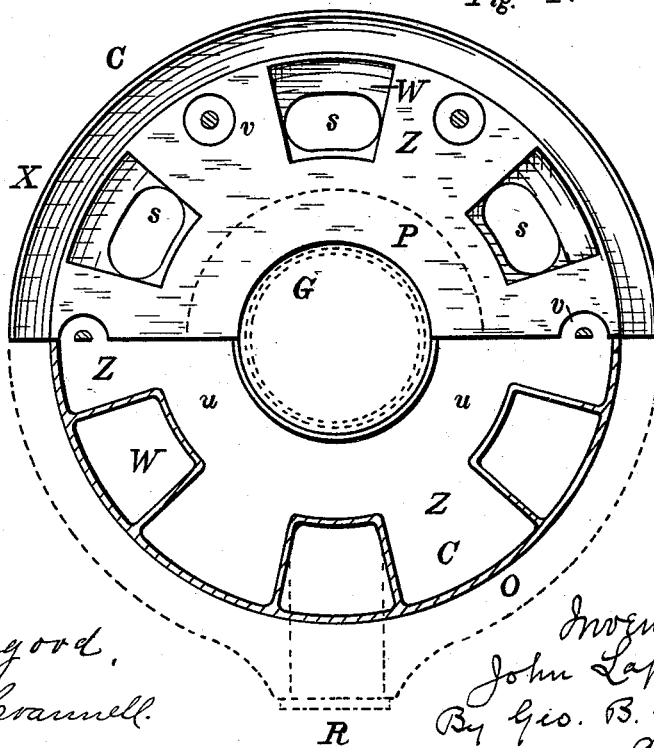


Fig. 4.



Witnesses:
R. F. Osgood,
C. F. Crannell.

Inventor:
John Lapp.
By Geo. B. Selden,
att.

UNITED STATES PATENT OFFICE.

JOHN LAPP, OF ROCHESTER, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 494,211, dated March 28, 1893.

Application filed February 11, 1892. Serial No. 421,098. (No model.)

To all whom it may concern:

Be it known that I, JOHN LAPP, a citizen of the United States, residing at Rochester, in the county of Monroe, in the State of New York, have invented certain Improvements in Steam-Boilers, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to certain improvements in the construction of sectional steam-boilers, which improvements are fully described and illustrated in the following specification and the accompanying drawings,—the novel features thereof being specified in the claim annexed to the said specification.

My improvements in steam-boilers are represented in the accompanying drawings, in which—

Figure 1 is a partial plan view, and also a partial horizontal section, on the line 1—1, Fig. 2. Fig. 2 is a vertical section on the line 2—2, Fig. 1. Fig. 3 is a partial plan view of the water-connection at the base of the sections, and also a partial horizontal section of the same, on the line 3—3, Fig. 2. Fig. 4 is a partial inverted view of the steam-space or water-connection at the top of the sections, and also a partial section of the same on the line 4—4, Fig. 2.

My improved boiler consists essentially of a series of sections, A, A, A, arranged with their vertical axes parallel, a water-connection or ring B at the base of the sections, and a steam or water-connection or ring C at the upper ends of the sections.

D is the outer inclosure or jacket, E the base-ring and F the grate.

G is the magazine.

The sections A A are preferably cut away upon their lower inner portions substantially from the bottom of the magazine to the bottom of the section, thereby forming an enlarged fire pot between the lower end of the magazine and the grate. This construction gives an increased space for the fire and also causes the heat to strike directly upon the bottom of the inwardly projecting portions of the sections, thereby adding materially to the heating capacity of the boiler. The sections are also provided with the projecting walls or partitions I I, J J, between which the descending flues H H are formed,—a passage being formed at

K, Fig. 2, through which the ascending flues L communicate with the downward flues H, and the water-connection B being shaped, as indicated at N, so as to permit the escape of the products of combustion from the descending flues into the space O between the sections and the jacket.

R represents a collar or connection for the attachment of the smoke-pipe.

As indicated in the drawings, the sections are conveniently formed by being cast in one piece with the projecting walls I I, J J, the interior water space being cored, and the sections provided on their upper and lower surfaces with openings *e e* through which communication is established with the upper and lower water-or steam-connections.

My improved boiler is designed to be used either as a steam or hot-water boiler, and consequently the upper connection between the sections will be filled with water or steam, when in use, as the case may be. The sections and the upper and lower connections are attached together by the bolts *c c*, which screw into a suitable boss *d*, Fig. 2, and extend upward through the openings *e*, being provided with nuts *f*, above the upper connection. The joints are made in any suitable way,—either by asbestos or other gaskets, or a conical thimble may be inserted, as at *g*, Fig. 2, or a ring *i* milled on one of the surfaces is arranged to project into a recess milled in the opposing surface. By placing the rods or bolts as above described they are entirely upon the inside of the boiler out of the way, the openings *e* being utilized for the passage of the rods without additional means for connecting the top and bottom sections. It also enables the flange X upon the cover being made integral therewith whereby a close joint is formed between them.

In boilers heretofore constructed in which the bolts for securing the sections together were passed through ears upon the outside of the boiler, it has been found impracticable to use the outer shell or jacket except it be joined to the cover by separate means for if the shell be placed upon the boiler before the bolts through the ears are tight it is impossible to tighten the bolts, and if the bolts are tightened first the shell must be secured thereto afterward which requires separate

means for doing it, all of which is avoided by the construction above described.

P is the cover for the magazine.

T represents the water supply-pipe, and U the outlet pipe. Any suitable number of these pipes may be used.

The walls I I may be butted against each other, as indicated at *j*, Fig. 1, or they may be lapped onto each other, as shown at *k*. The surface of the sections exposed to the upward flue L may be extended so as to increase its efficiency, in any suitable way,—such for instance as the projecting portions *n n'*. The passages K may be made of the same width, or nearly the same width, as the flues H. The lower water connection is recessed or beveled outward, as indicated at N, to form free passages for the heated gases from the lower ends of the descending flues into the space O. Between these recesses N are located the water spaces Y, in which are formed the openings *r*, which correspond with the openings *e* in the sections. The water-spaces Y communicate with each other through the passages *t*.

In order to provide for cleaning the flues L and H, I form openings *s* in the upper-connection, which are closed by the caps or covers V. These openings are placed immediately above the walls I I, so that access may be had through them to either flue, or both sides of the walls may be cleaned by a suitable instrument inserted through the openings. The upper connection C is provided with a projecting flange X, to which the upper edge of the jacket is secured by a band or other suitable device. The form of the upper connection will be understood from an examination of the inverted view, Fig. 4. It closes the entire top of the boiler, except as it is open for the magazine, and to permit access to the flues through the openings *s*. The water spaces, Z, are connected together by the passages *u*, and they are provided with openings *v* corresponding with the holes *e* in the sections. Recesses W are formed in the upper connection, immediately below the caps V.

In order to provide access to the fire, I insert between two adjacent sections a pipe or passage, *x x*, provided with the door *w*,—the sections at this point being reduced in dimensions for the purpose.

Although I prefer the arrangement shown, in which the walled sections are arranged radially around a central magazine, it will be understood that other arrangements may be

adopted without departing from the principle of my invention. Thus the magazine may be dispensed with, and the sections may be made of forms different from those herein shown, and arranged side by side in a straight line,—the flues being made as herein described, by the projecting walls of the sections.

I provide a direct draft by a connection between one of the openings *s* and the smoke-flue.

The cap V is omitted and a suitable passage, A', Fig. 1, is formed from the opening to the flue, which passage is provided with a damper.

It is obvious that the walls I or J may extend entirely across the flues to the adjacent section, but I prefer the construction shown as easier to cast.

I claim—

In a sectional boiler, the combination, with an annular bottom section, having an inlet in its side wall, and a series of openings in its top wall, an annularly arranged series of vertical sections secured thereto, each of said sections being provided with an opening at each end, and with a smoke flue, said flues communicating with each other, and the lower openings registering with the openings in the top of the bottom section, an integral top or cover for the boiler consisting of a hollow annular section provided with an outlet and with a series of openings in its bottom, said openings registering with the openings in the tops of the vertical sections, said cover being also provided with a series of recesses in its under side to register with the smoke flues of the vertical sections, and the upper side of the top being provided with an opening and a cover for each of said recesses, said cover being further provided with an integral annular flange X projecting from its outer edge or periphery, and with a pipe collar formed integral with the cap or cover and communicating with the smoke flues, bolts through the registering opening in the top section, through the vertical section and the opening in the bottom section and engaging with a boss in the water space of the bottom section, an outer shell engaging with the flange X and with the bottom section, and a magazine suspended from the cover down between the vertical sections, substantially as set forth.

JOHN LAPP.

Witnesses:

JOHN J. BERRIGAN,
GEO. B. SELDEN.