No. 829,889. PATENTED AUG. 28, 1906.

M. RAPP.

BOILER.

APPLICATION FILED NOV. 14, 1905.

2 SHEETS—SHEET 1.

Fig. 7.

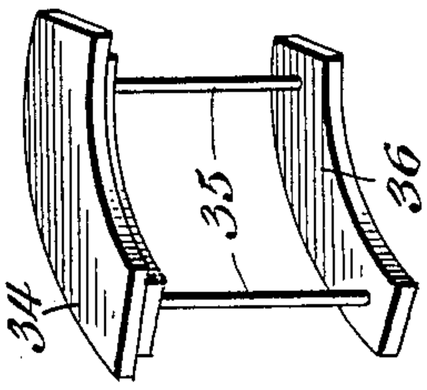


Fig. 8.

Fig. 3.

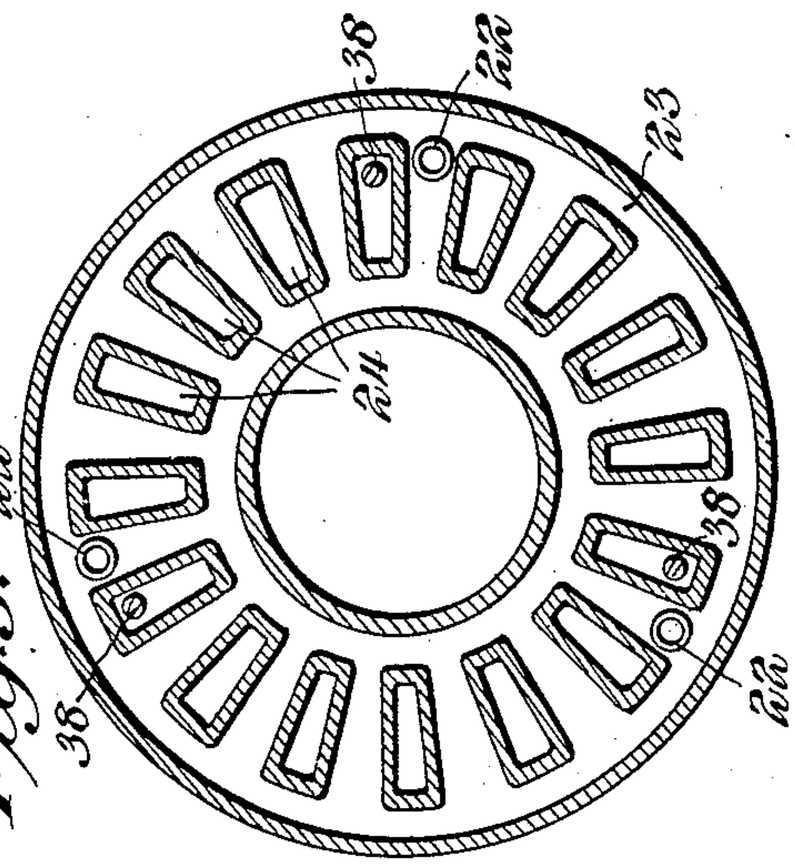


Fig. 4.

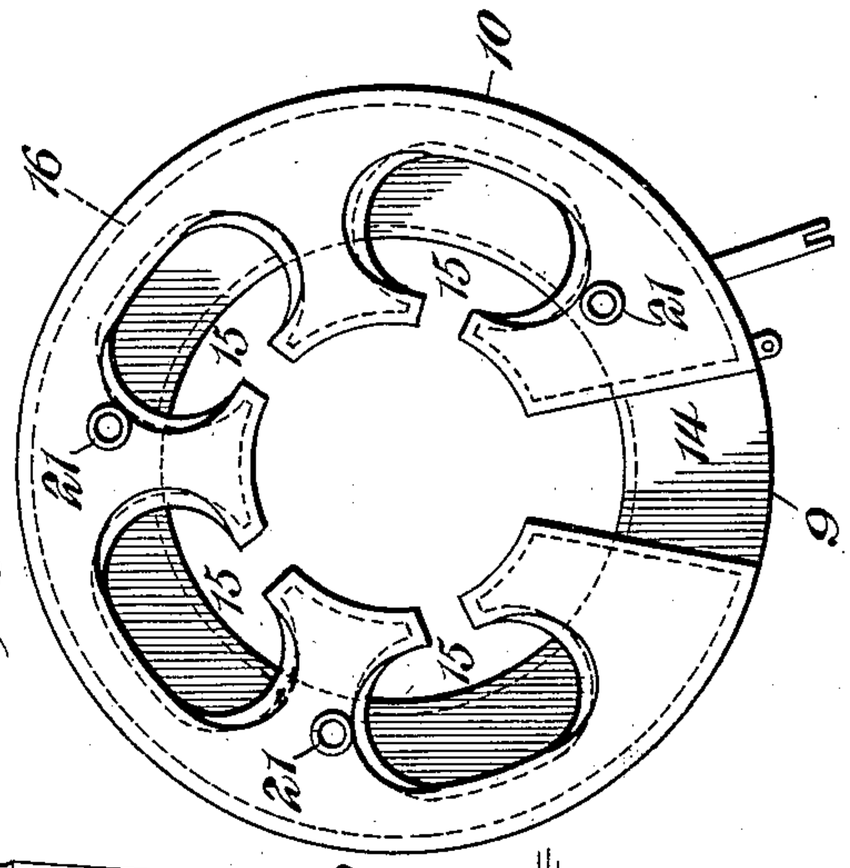
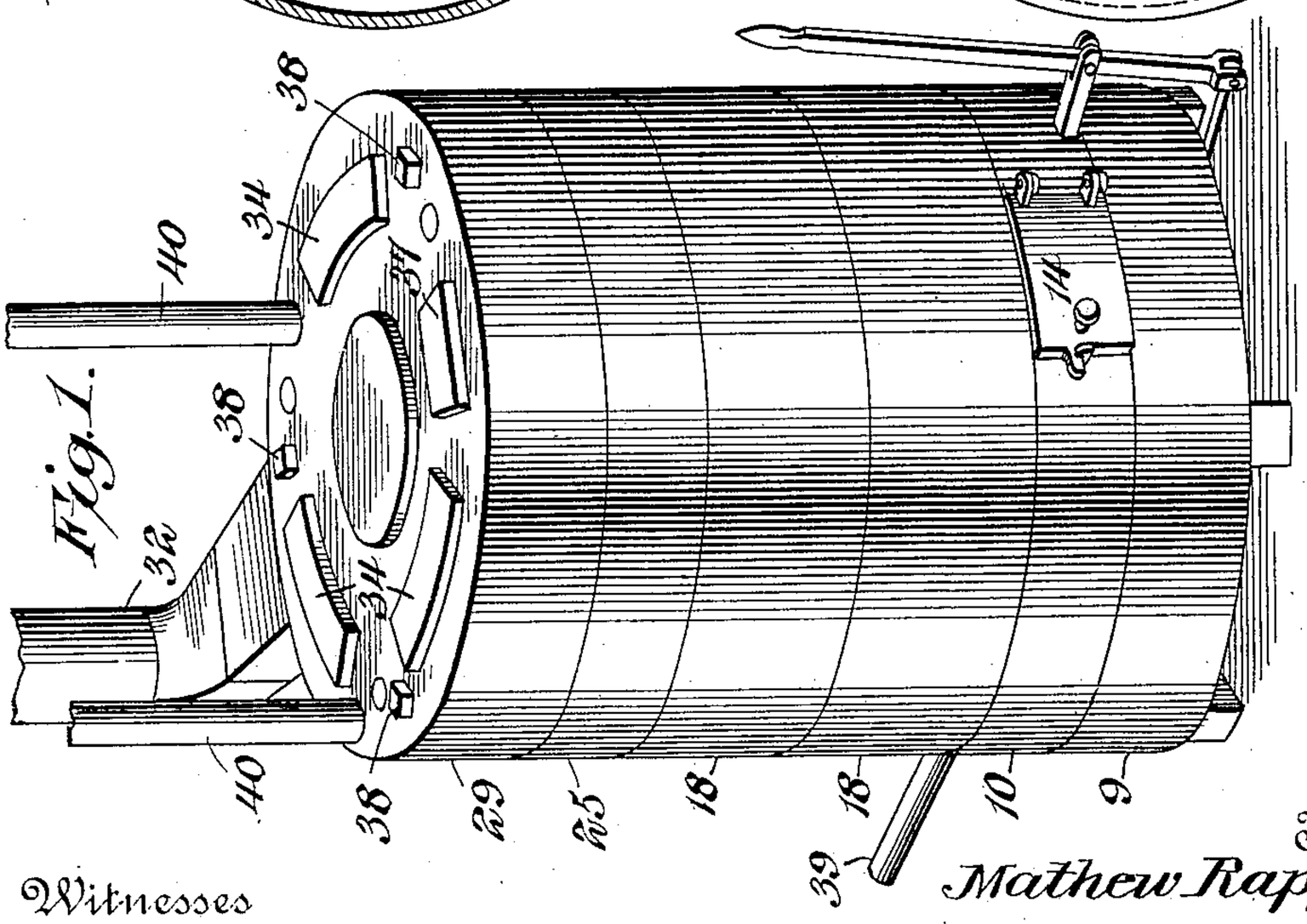


Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

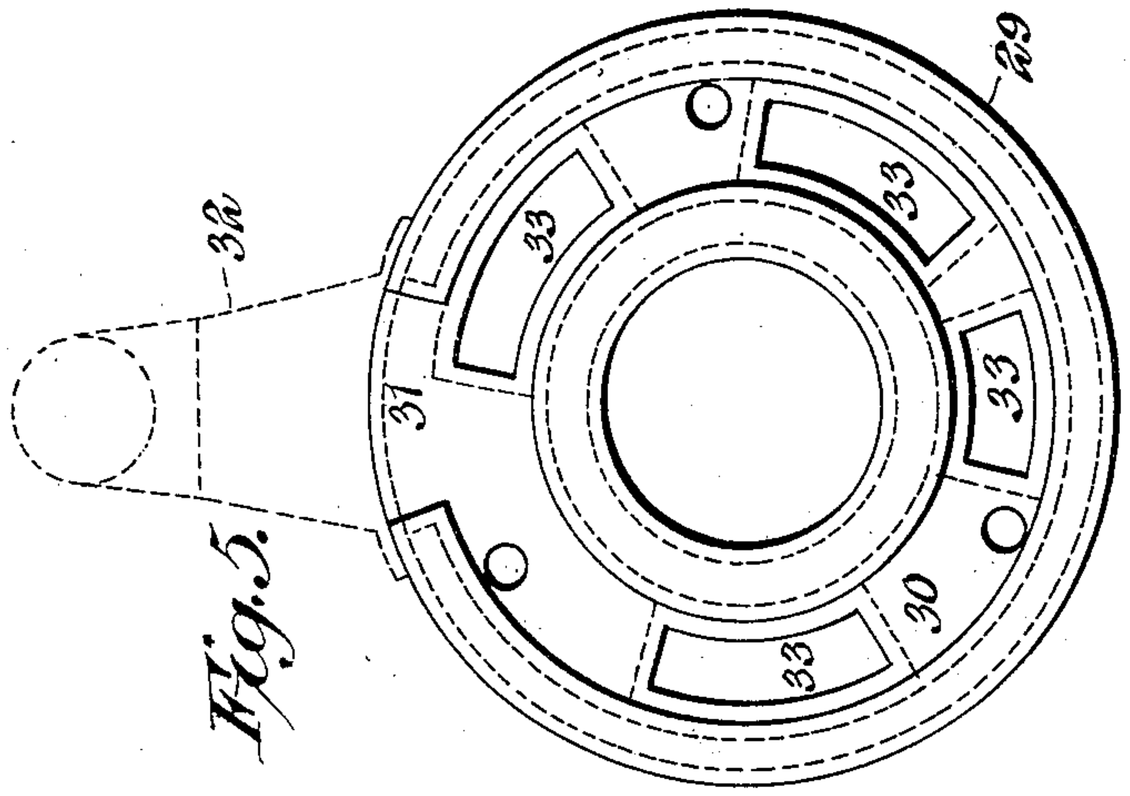


Fig. 6.

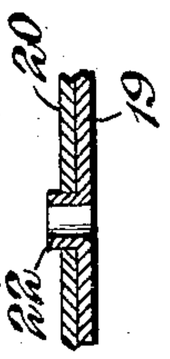
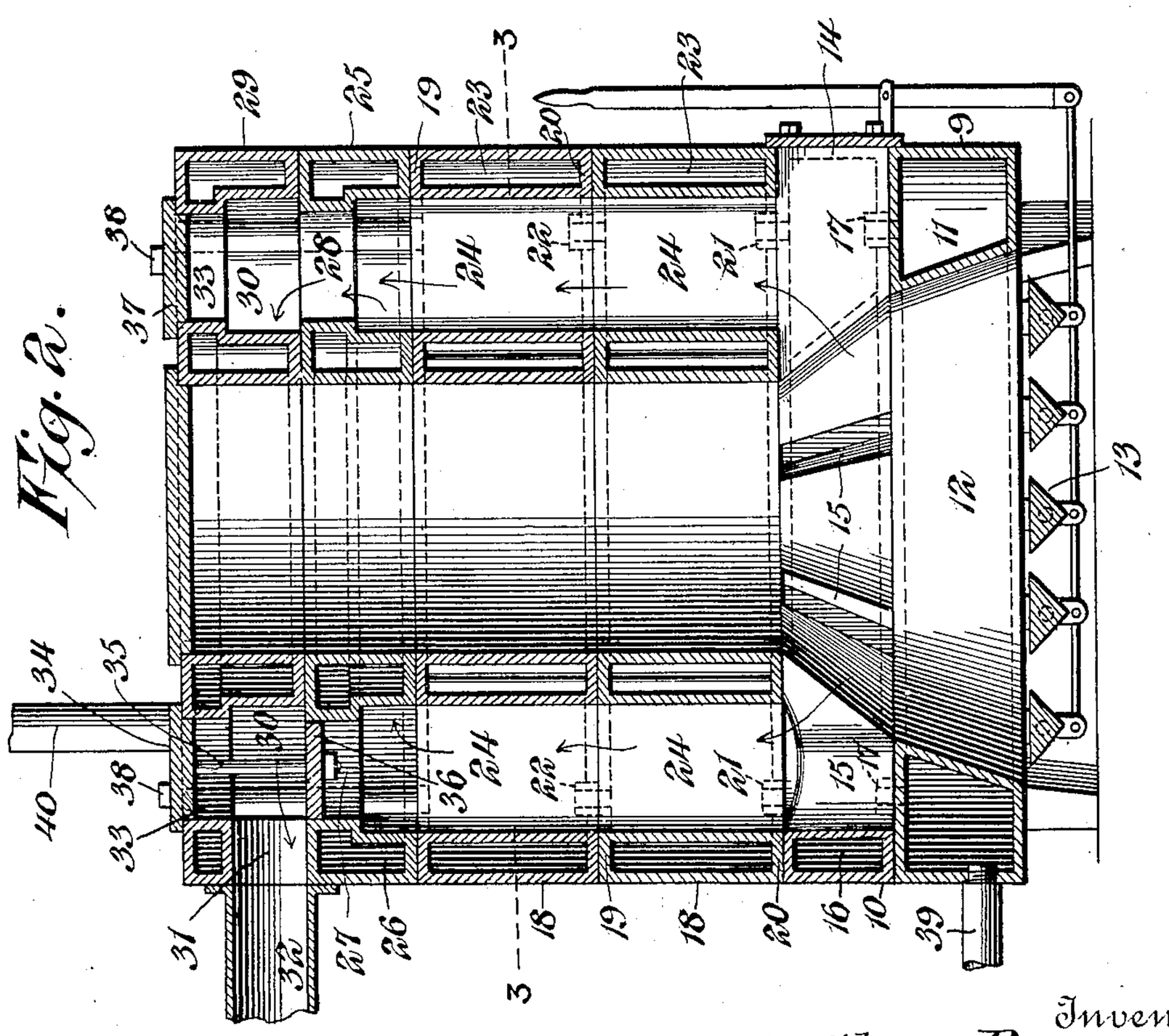


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

MATHEW RAPP, OF MORTON, ILLINOIS.

BOILER.

No. 829,889. Specification of Letters Patent. Patented Aug. 28, 1906.

Application filed November 14, 1905. Serial No. 287,290.

To all whom it may concern:

Be it known that I, MATHEW RAPP, a citizen of the United States, residing at Morton, in the county of Tazewell and State of Illinois, have invented a new and useful Boiler, of which the following is a specification.

This invention relates more particularly to boilers for heating purposes, though perhaps useful in other relations.

The principal object is to provide a simple structure of a novel nature wherein the parts can be readily manufactured, are entirely accessible, and are not liable to be burned out, said structure maintaining the water and products of combustion in intimate relation during the passage of the latter through the boiler, thereby effectively utilizing the heat from said products of combustion.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a perspective view of the boiler. Fig. 2 is a vertical sectional view through the same. Fig. 3 is a horizontal sectional view taken on the line 3 3 of Fig. 2. Fig. 4 is a top plan view of the furnace. Fig. 5 is a bottom plan view of the cap-section. Fig. 6 is a detail sectional view through the abutted walls of the two sections, showing the communication between the chambers of said sections. Fig. 7 is a detail prespective view of one of the double closures. Fig. 8 is a detail perspective view of the single closure employed.

Similar reference-numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated a furnace is provided that is made up of a base-section 9 and a top section 10. The base-section is in the form of a ring having an annular water-chamber 11 therein and a central combustion-chamber 12, a suitable grate 13 being located beneath and constituting the bottom of the combustion-chamber. The top section 10, constituting the upper portion of the combustion-chamber, is provided with a doorway 14 and a series of outwardly-extending outlets 15. This top section is also provided with a water-chamber 16, that partially surrounds the outlets and is in communication with the chamber 11 by means of openings formed in the abutted top and bottom walls of the two sections, one of said walls having nipples 17, that pass through the openings of the other wall. Supported on the above-described furnace is a body comprising a plurality of ring-sections 18, any number of which may be used, as desired. These ring-sections have circular side walls and top and bottom walls 19 and 20. The bottom wall of the lower section rests upon the top of the furnace and has communication therewith through nipples 21. In like manner the bottom of the upper section rests upon the top of the lower section and also has nipples 22, these nipples thus forming the means of communication between annular water-chambers 23 in the said body-sections. Flue-sections 24 are located in the body-sections and are completely surrounded by the water-chambers. These flue-sections are in alinement and a plurality of the same communicate at their lower end with each of the outwardly-extending outlets 15.

Mounted on the top of the body is a smoke-box section 25 in the form of a ring having an annular chamber 26 communicating with the upper ends of the various flues 24. This smoke-box section is, furthermore, provided in its top with a series of openings 27, alined with the various flues, one of the openings 28 being located at one side and constituting a smoke passage-way. A cap-section 29 is located on the smoke-box section and is in the form of a ring having an annular smoke passage-way 30, with which the opening 28 communicates. The cap-section 29 is provided with a smoke-outlet 31, located on the opposite side to the opening 28 and designed to be connected to a suitable stack or pipe 32. This cap-section is provided in its top with openings 33, which openings are in alinement with the openings 27, so that the upper end of the flues are accessible through the alined openings. Under ordinary conditions, however, the various openings, with the exception of that designated 28, are closed, and for this purpose closures 34 are provided for the cap-section, which closures rest upon the top thereof and are provided with depending bolts 35, carrying at their lower ends closures 36 that enter the openings 27. A single closure 37 is provided for the opening in the cap-section that is over the opening 28. The various sections are secured together by suitable tie-bolts 38. A return-pipe 39 communicates with the base-section of the furnace, and supply-pipes 40 are in communication with the upper end of the same, these various pipes leading to the points of use, as will be

readily understood. With this structure it will be apparent that the combustion-chamber and various flues are completely surrounded by water, so that there is little danger of the same becoming burned out. Moreover, by this arrangement the water is in intimate relation with the products of combustion until the same leave the boiler, and a high degree of efficiency is thereby secured. It will be apparent that the sections of the structure can be readily manufactured and assembled, and, furthermore, should one or more become injured or useless from any cause the same can be replaced without the necessity of an entirely new boiler.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a boiler of the character described, a body composed of sections secured together, said sections having communicating flue portions forming separate and independent flues through the body and communicating water-chambers, and a furnace communicating with said independent flues.

2. In a boiler, a body composed of sections secured together, said sections having alined flue-sections and water-chambers surrounding the same, said sections having abutted walls that cut off communication between the flue-sections that are out of alinement and form independent flues through the body, said water-chambers of the different sections being in communication, and a furnace communicating with the independent flues.

3. In a boiler of the character described, a body composed of hollow sections superposed one on the other and having top and bottom walls, the bottom wall of one resting on the top wall of the adjacent section, said coacting top and bottom walls being provided, one with an opening and the other with a nipple fitting in the opening and constituting means of communication between the interiors of the different sections, alined independent flue-sections extending through the hollow sections, forming independent flues through the body and a furnace communicating with the flue-sections.

4. In a boiler of the character described, a body composed of hollow ring-sections having tops and bottoms, the bottom of one section resting upon the top of the section beneath, flue-sections extending through the ring-sections in spaced relation to the side walls thereof, and forming independent flues through the body and a furnace communicating with the flue-sections.

5. In a boiler of the character described, the combination with a furnace-section having a chamber provided with a plurality of outwardly-extending outlets on different sides thereof, of a body-section located on the furnace-section and having flues communicating with the outwardly-extending outlets, said body-section having a water-chamber surrounding the flues.

6. In a boiler of the character described, the combination with a furnace having a combustion-chamber provided with a plurality of outwardly-extending outlets on different sides thereof, of a body located on the furnace and having flues therethrough, a plurality of flues communicating with each of the outwardly-extending outlets, said body having a water-chamber surrounding the flues.

7. In a boiler of the character described, the combination with a furnace-section having a combustion-chamber provided with a plurality of outwardly-extending outlets on different sides thereof, of a plurality of ring body-sections supported on the furnace-section and having communicating water-chambers, and independent flues extending through the body-sections and communicating with the different outlets of the furnace-section.

8. In a boiler of the character described, the combination with a furnace comprising a base-section having a grate, a combustion-chamber and a water-chamber, a top section for said furnace having a plurality of outwardly-extending outlets communicating with the combustion-chamber, and a water-chamber surrounding the same, of a body comprising ring-sections supported on the furnace and having flues therethrough that communicate with the outwardly-extending outlets, forming a plurality of independent flues through the body and water-chambers surrounding the flues.

9. In a boiler of the character described, the combination with a furnace and body thereon, said body having flues communicating with the furnace, of a smoke-box section located on the body, and a cap-section located on the smoke-box section, said smoke-box section having an opening in one side that communicates with the corresponding side of the cap-section and said cap-section having an outlet communicating with the opposite side of the same.

10. In a boiler of the character described, the combination with a furnace and body thereon, said body having flues communicating with the furnace, of a section located on the body and having openings in line with the flues, and closures for said openings.

11. In a boiler of the character described,

the combination with a furnace and body thereon, said body having flues communicating with the furnace, of a smoke-box section located on the body, a cap-section located on the smoke-box section, said sections having openings in line with the flues, and closures for the openings in both sections.

12. In a boiler of the character described, the combination with a furnace comprising sections, said furnace having communicating water-chambers, a combustion-chamber and outwardly-extending outlets communicating with the combustion-chamber, of a body located on the furnace and comprising sections provided with water-chambers and flues extending through said water-chambers and communicating with the outlets of the furnace, a smoke-box section located on the body and having a chamber communicating with the flues, said smoke-box section having openings in its top in line with the flues, a cap section arranged on the smoke-box section and having a channel communicating with one side of the smoke-box-section chamber, a smoke-conduit connected to the opposite side of the cap-section, said cap-section also having openings in its top alined with the openings in the top of the smoke-box section, closures for the openings in the cap-section, and closures for the openings in the smoke-box-section top, said latter closures being connected to the closures of the cap-section.

13. In a boiler of the character described, an upright body comprising sections, in the body-sections, forming a plurality of independent flues, communicating flue-sections through the body, and water-chambers surrounding the flue-sections.

14. In a boiler of the character described, an upright body comprising sections having a central fuel-magazine extending through the sections, water-chambers surrounding the magazine, and alined flues surrounding the magazine and extending through the chambers, said sections having abutted top and bottom walls that cut off communication between the flues that are not in alinement.

15. The combination with a body having flues therethrough, of a smoke-box section mounted on the body and having an opening alined with certain of the flues, a cap-section mounted on the smoke-box section and having an opening alined with the opening in the smoke-box section, a closure detachably mounted over the opening in the cap-section, and another closure suspended from the first closure and covering the opening in the smoke-box section, the latter closure being removable through the opening in the cap-section when the closure for the same is removed.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MATHEW RAPP.

Witnesses:

JOHN GETZ,

JOSEPH HAUTER, Jr.