

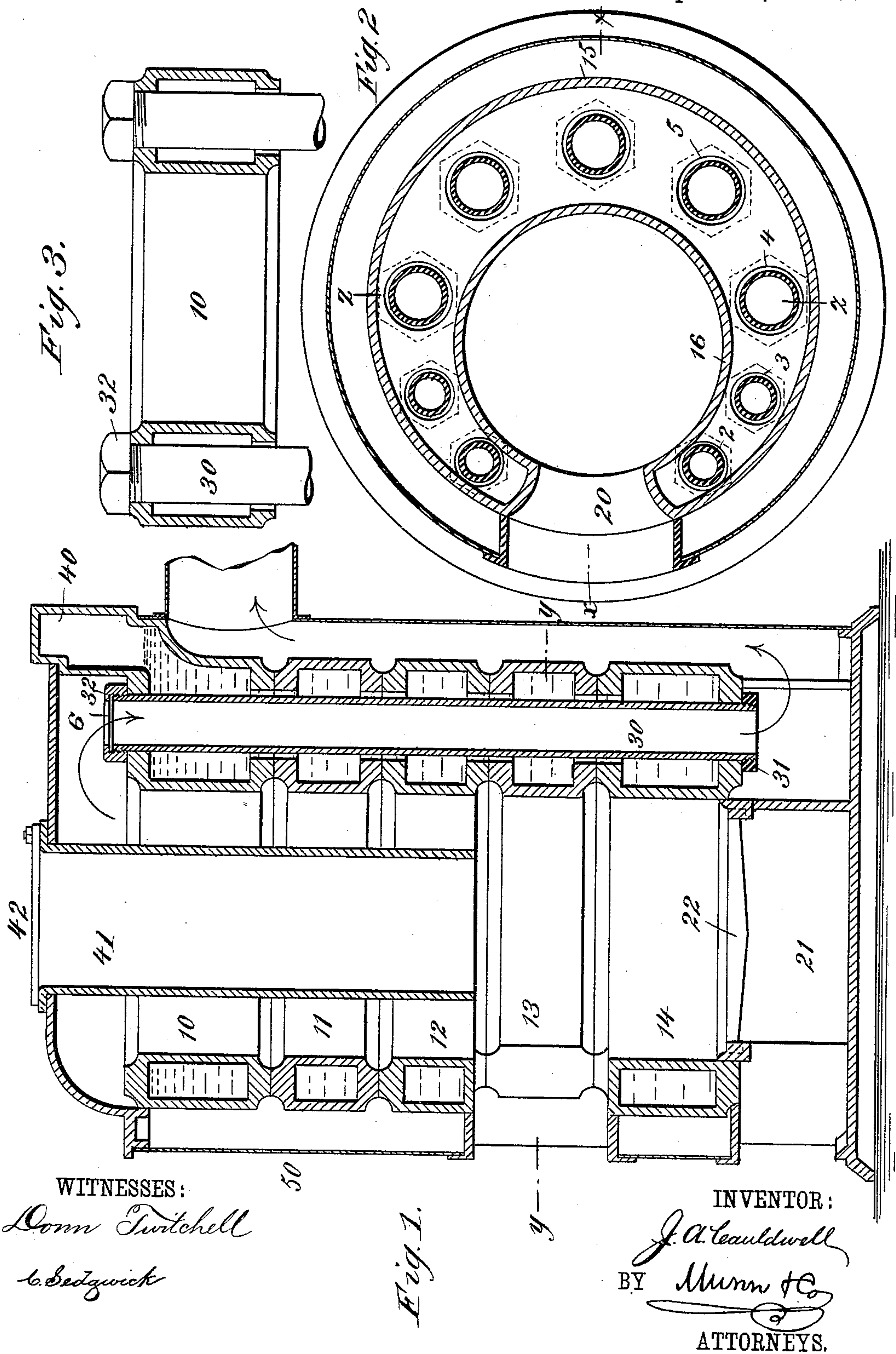
(No Model.)

J. A. CAULDWELL.

BOILER.

No. 370,241.

Patented Sept. 20, 1887.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JAMES A. CAULDWELL, OF OWEGO, NEW YORK.

## BOILER.

SPECIFICATION forming part of Letters Patent No. 370,241, dated September 20, 1887.

Application filed December 17, 1886. Serial No. 221,845. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. CAULDWELL, of Owego, in the county of Tioga and State of New York, have invented a new and Improved Boiler, of which the following is a full, clear, and exact description.

This invention relates to a novel form of boiler of the sectional type, the object of the invention being to so dispose and form the bolts by which the several sections are held together that the sections and the bolts will expand about equally, and consequently the bolts will at all times act to hold the sections in close contact.

To the ends named the invention consists in the construction and arrangement of parts, as will be hereinafter fully described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a central vertical sectional view of my improved form of boiler, the view being taken on line *xx* of Fig. 2. Fig. 2 is a horizontal section taken on line *yy* of Fig. 1; and Fig. 3 is a view of a portion of the upper section of the boiler, the view being taken upon a line corresponding with that of the line *zz* in Fig. 2.

In constructing such a boiler as the one forming the subject-matter of this application, and illustrated in the drawings above referred to, I provide a number of circular sections, such as those shown at 10, 11, 12, 13, and 14 in Fig. 1, these sections, with the exception of the section 13, being formed of annular castings, in which the outer walls, 15, and the inner walls, 16, are non-concentric. The section 13 is a crescent-shaped casting—that is, a casting formed with an opening, 20, through that side where the inner wall, 16, most closely approaches the outer wall, 15.

The upper and lower walls of each of the boiler-sections are formed with apertures 2 3 4, &c., the apertures 2 of each section being arranged to register with the apertures 2 of all the other sections, and so on with all of the correspondingly numbered and arranged apertures.

In constructing a boiler from such sections as

those illustrated and described, the section 14 is mounted in a proper bed above an ash-pit, 21, the grate-bars 22 being arranged in connection with this section. The section 13 is placed in position above the section 14, the section 12 above the section 13, and so on upward, the meeting-faces of the sections being truly ground, so that when brought together they will make a snug joint. After the sections have been placed as described, tubes 30, slightly smaller than the registering-apertures in connection with which they are arranged, are passed downward through each set or series of apertures, the ends of these tubes being threaded in order that they may be engaged below by nuts 31 and above by nuts 32, the nuts 32 being formed with inwardly-extending flanges 6, which flanges act as shields to protect the upper ends of the tubes from the action of the fire. The upper section, 10, is formed with a steam dome or chamber, 40.

A boiler constructed as described is inclosed within a jacket, 50, through the top of which there is inserted a downwardly-extending cylinder, 41, that is closed by a cover, 42, the fire-door of the boiler being located in front of the opening 20 of the section 13, as will be readily understood.

Such being the general construction of the boiler, the operation is as follows: A fire having been kindled within the fire-chamber—that is, above the grate-bars 22—the heated gases and products of combustion will pass upward above the section 10, and then downward through the tubes 30, to pass again upward between the jacket and the outer walls of the boiler-section; and in practice it will be found that the tubes 30 and the boiler-sections will expand uniformly, and that the nuts arranged in connection with the tubes, having been once properly adjusted, will not require any further attention.

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

1. A sectional boiler formed of a series of hollow rings having series of apertures in their upper and lower sides, the rings resting one upon the other with their apertures in alignment, and the space within the rings forming the fire and combustion chamber, the tubular



bolts extending down through the apertures of the several rings and forming the flues for the products of combustion, and nuts screwing on the ends of the tubes and binding the faces 5 of the rings together, the inner apertures being of greater diameter than the tubes to form water-spaces, substantially as set forth.

2. The combination, with the series of hollow rings 10, 11, 12, 13, and 14, resting one 10 upon the other, and having a series of aligned apertures through their upper and lower faces, a door-opening, 20, being formed in the ring 13, and the ring 14 forming the fire-pot, below which is the ash-pit, of the tubular bolts 15 30, extending through the apertures in the several rings to form the boiler-flues, nuts screwing on the ends of the bolts and drawing the rings firmly together, and the outer casing, 50, whereby the products of combustion will 20 pass up within the rings, then down through the tubular bolts and up around the outer sides of the rings to the outlet in the casing, substantially as set forth.

3. A sectional boiler comprising a series of hollow rings secured together and having series 25 of registering apertures, the space within the rings forming the fire and combustion chamber, and the inner walls of the rings being eccentric to the outer walls, and a door-opening 30 being formed through one of the rings at its point of least eccentricity, substantially as set forth.

4. The combination, with a series of boiler-sections formed with registering apertures, of a series of tubes which extend through said 35 apertures, said tubes being of less diameter than the apertures in connection with which they are arranged, and upper and lower retaining-nuts arranged in connection with the tubes, the upper retaining-nuts being formed with 40 inwardly-extending flanges, substantially as described.

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Witnesses:

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