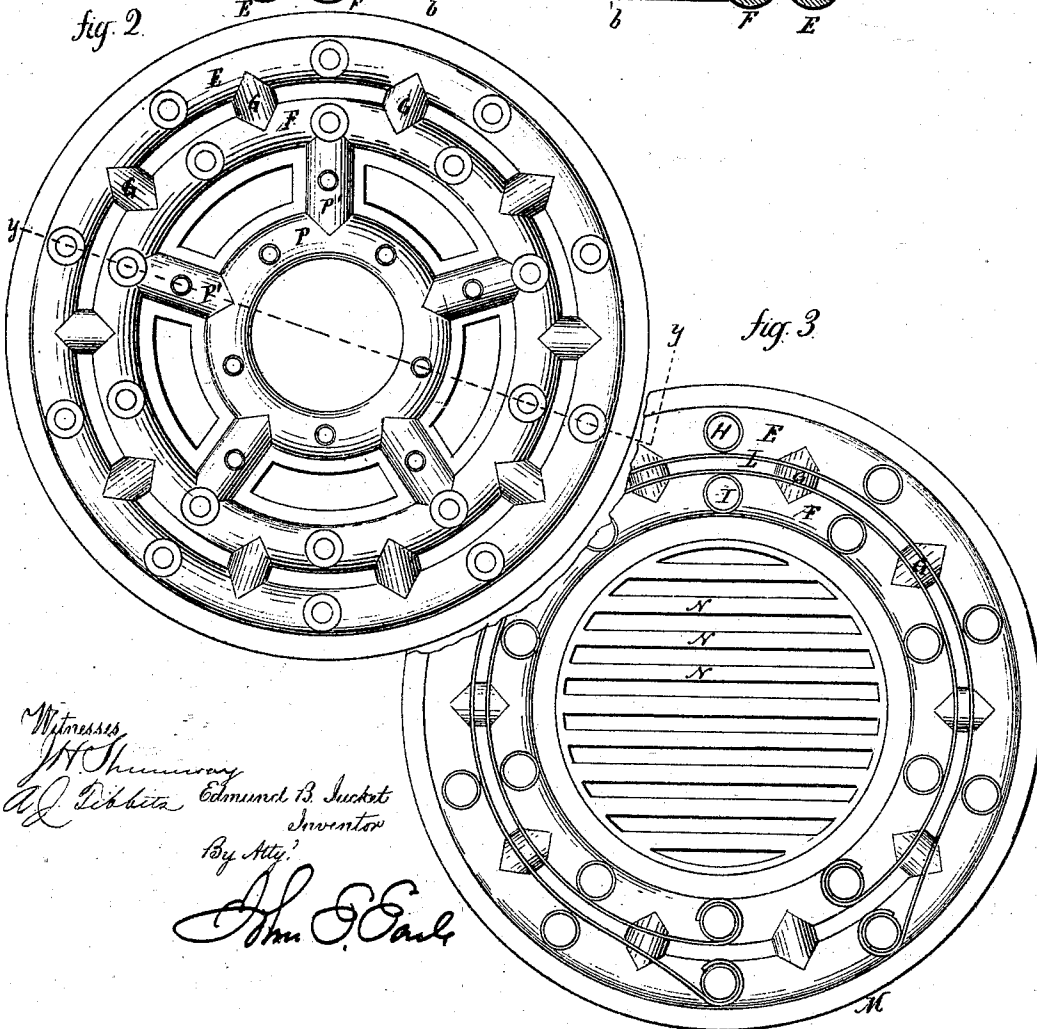
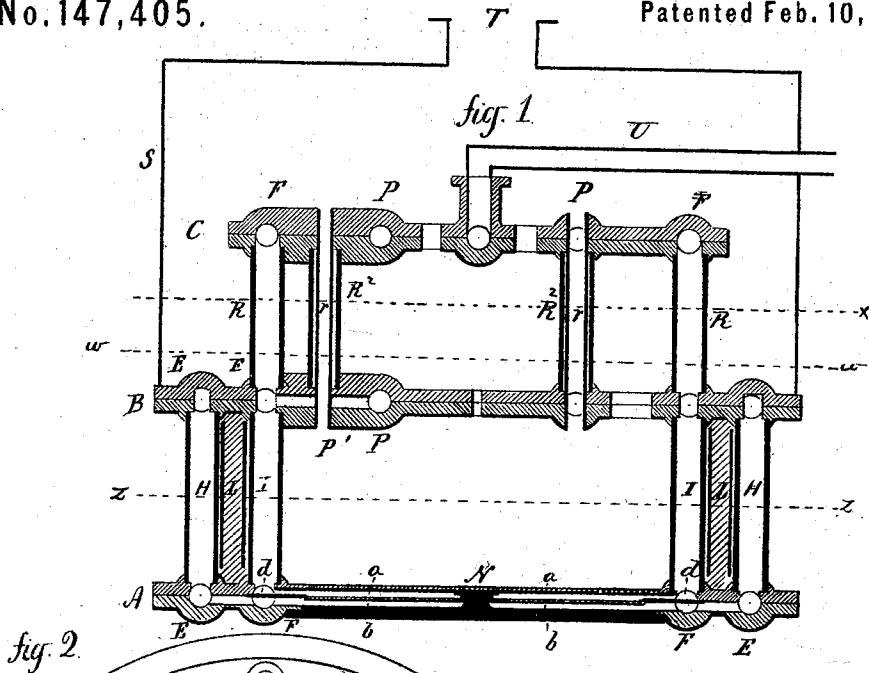


E. B. JUCKET.

Sectional Steam-Boilers.

No. 147,405.

Patented Feb. 10, 1874.



Witnesses
W. H. Shumway
Edmund B. Jucket
 By Atty.
John E. Earle

UNITED STATES PATENT OFFICE.

EDMUND B. JUCKET, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN SECTIONAL STEAM-BOILERS.

Specification forming part of Letters Patent No. **147,405**, dated February 10, 1874; application filed October 24, 1873.

To all whom it may concern:

Be it known that I, EDMUND B. JUCKET, of Providence, in the county of Providence and State of Rhode Island, have invented a new Improvement in Sectional Steam-Boilers; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a vertical central section on line *yy* of Fig. 2; Fig. 2, a transverse section on line *xx*; and in Fig. 3, a transverse section on line *zz*.

This invention relates to an improvement in boilers for generating steam for power or heating purposes; and it consists in the combination and arrangement of tubes whereby a circulation of the water is maintained and through the bars of fire-grates.

The boiler is made in several transverse sections, A B C, two or more in number. These sections are preferably made from cast metal, as being cheaper than wrought, the first and second consisting of two hollow rings, E F, these rings connected at several points, as at G, and vertically between the rings E F of one plate and the corresponding rings of the next numerous short tubes, H I, are arranged, connecting the rings of one section with the rings of the other. Between these tubes H I a casing, L, is arranged, inclosing the inner tubes I, leaving the tubes H outside. This casing forms the fire-box, an opening being left or formed therein at some convenient point, as at M, Fig. 3, to the fire-box. The grate is arranged within the inner ring F in the lower section, as seen in Figs. 1 and 3. The grate-bars N are formed with two longitudinal passages, *a b*, the one above the other, as seen in Fig. 1. These passages extend from each end to near the center, and there open one into the other, and connect, by corresponding passages, with the ring F. The ring F is divided by a partition, *d*, so that the upper half of the ring F communicates with the upper passage *a* through the grate-bars, and the lower portion with the lower passage *b*, so that when the rings and tubes are filled with water the water will flow through the two passages *a b* in the

grate-bars. The second section B is formed with a third internal ring, P, connected with the second ring by radial connections P', and above this section a third section, C, is formed, with rings corresponding to the rings P F of the second section. Between the ring F of the second section and the ring F of the third section tubes R, more or less in number, are arranged. The upper section C and the other sections, if they be added, are inclosed by a case, S, this case provided with an outlet, T, for the smoke and products of combustion, and the upper section provided with an exit-tube, U, for the steam to pass from the boiler. Water is supplied to fill the apparatus above the section B—say to the line *w*. Fire is kindled upon the grate in the fire-box in the usual manner. The heat communicated to the tubes I will cause a rapid circulation of the water therein into the ring F of the second section, whence it flows through the connections G to the outer ring E of that section; thence down through the tube H to the outer ring E of the lower section; thence the water passes into the lower division of the ring F of the lower section into the lower passage *b* of the grate-bars; thence into the upper passage *a* back into the upper division of the ring F; thence to the tubes I, maintaining a constant circulation through the grate-bars, rings, and tubes, by which the grate-bars are prevented from springing or twisting, at the same time presenting a very large amount of fire-surface. Between the second section and the third numerous tubes, R², are arranged, connecting the second section with the third, and through these tubes R² flues *r* are placed, so that the products of combustion will pass through these flues and be surrounded by the water and steam in the tubes. The upper section C, which is above the water, forms a steam-chamber, and through this section the heat passes, superheating the steam which is generated below. The hollow grate-bars may be dispensed with, in which case the partition dividing the lower ring F will not be required, the circulation being directly up through the tubes I and down through the tubes H and rings E F.

I claim as my invention—

1. The combination of the rings E F in the first and second sections, connected by the

vertical tubes H I, and with each other by connections G, with the tubes I, inclosed by the casing L, substantially as described, so as to form the fire-box between the said sections and within the tubes I.

2. In combination with the rings E F, tubes H I, and connections G, inclosed in casing L, the grate-bars N, formed with the passages *a b*, the lower ring F being divided by the partition

d, so that the lower portion of the said ring F communicates with the lower passage *b* in the grate-bar, and the upper portion with the upper passage *a* of the grate-bar, substantially as set forth.

EDMUND B. JUCKET.

Witnesses:

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