

A. KIPP, Jr.

Sectional Steam-Boiler.

No. 164,377.

Patented June 15, 1875.

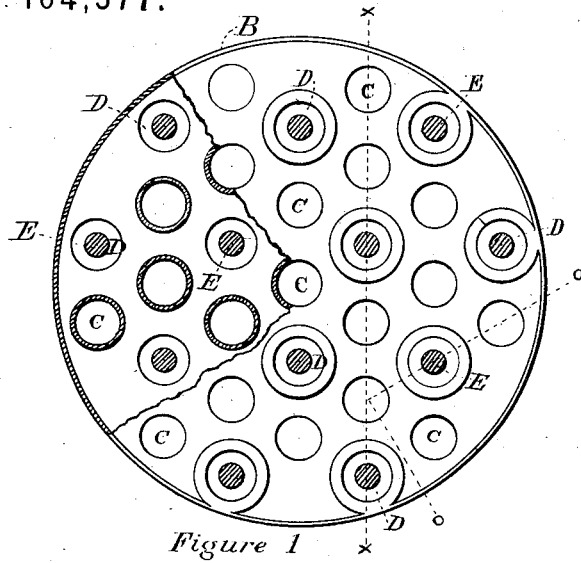


Figure 1

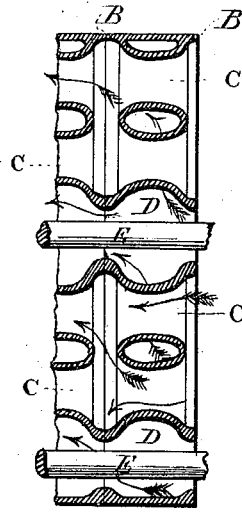


Figure 2

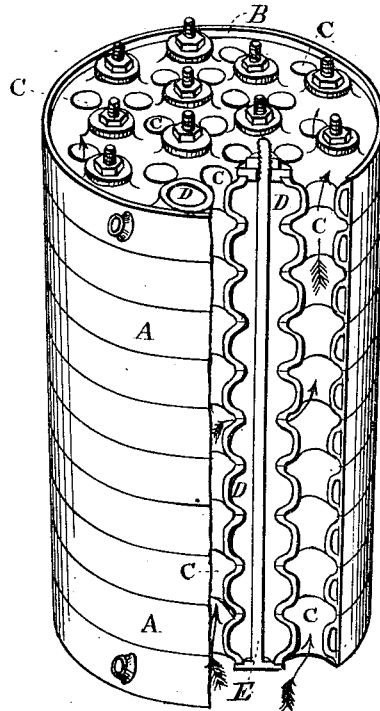


Figure 3

Witnesses:

Russell Barnum
Henry Patner

Inventor:

A. Kipp, Jr.

UNITED STATES PATENT OFFICE.

ABRAHAM KIPP, JR., OF SING SING, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO EDWARD EVERETT, OF SAME PLACE.

IMPROVEMENT IN SECTIONAL STEAM-BOILERS.

Specification forming part of Letters Patent No. **164,377**, dated June 15, 1875; application filed April 2, 1875.

To all whom it may concern:

Be it known that I, ABRAHAM KIPP, Jr., of Sing Sing, Westchester county, State of New York, have invented a Sectional Steam-Boiler, of which the following is a specification:

My invention is illustrated in the accompanying drawings, of which—

Figure 1 is a horizontal view of one of the sections, a part being shown in section midway of its thickness. Fig. 2 is a vertical section of the same through the line *xx* of Fig. 1. Fig. 3 is a perspective view of the boiler, a portion, included between the lines *oo* of Fig. 1, being shown in section.

The general form of the sections A, is that of a short cylinder or disk, having a rim, B, raised a little above the upper and lower surfaces of the disk. The interior is perforated with numerous air passages or flues, C, which are flared or trumpet-shaped at their upper and lower extremities. Intermediate with these, and arranged at suitable intervals, are water and steam passages D, the necks of which rise a little higher than the mouths of the flues C, and to a level with the outside rims B of the section. The mouths of the water-passages D, together with the rims B, are accurately planed or turned off flat, so that when the several sections to form a boiler are placed one on another, as shown in Fig. 3, they coincide, and form vertical channels for the water and steam to ascend or descend through the series. Through the middle of these passages pass the bolts E, leaving sufficient space for the water around them. Within the sections the several water-spaces connect with each other by passages between the flues, which they entirely surround. Between any two adjoining sections the flaring-mouths of the hot-air flues expand into a shallow space extending over the entire surface of the disks, excepting such part of their area as is occupied by the connecting-mouths of the water-passages. The raised rims B of the several sections meet each other and prevent the escape of the heated gases to the exterior. A suitable number of these sections being piled on each other and firmly connected by the bolts E which are furnished with heads

and washers and nuts for that purpose, form a boiler through which, vertically, are the flues C, leading from the fire to the chimney, and the passages D for the circulation of the water and steam, and horizontally, the air-spaces between the sections connecting each flue with the others, and within the sections the water-passages communicating each with the rest, thus forming two series of passages for hot air and water respectively, which may be compared to a double net-work, intimately interlacing and surrounding each other, with a very large amount of heating-surface. The boiler is set over a furnace, and provided with a smoke-pipe, &c., as is usual with other upright boilers. Steam and water connections are made where desired through the periphery of the sections.

It will be perceived that, the spaces sustaining pressure being minutely divided by the walls of the air-passages, great strength results with but little thickness of metal. The air-flues act as hollow stays to hold the upper and lower walls of the sections together. The bolts, being one to each perpendicular water-passage, have only the pressure on the cross-section of the passage each is in to sustain. Therefore, this form of boiler is one of remarkable strength, and in consequence admits of its construction of cast-iron, at a cost far below that of any wrought-iron boiler of equal strength and amount of heating-surface.

In boilers of larger size than the one represented it is contemplated to attach cellular water legs or casings, surrounding the fire-chamber, and also steam-receptacles above, the same being connected with the water and steam spaces by prolonged bolts, in the manner described for connecting the sections. The exterior form of the sections may be circular, polygonal, or otherwise; and to form a larger boiler, a number of sets of sections may be set side by side, and suitably connected.

The above-described device may be applied, not only as a steam-boiler, but to numerous other purposes, such as a feed-water heater, water-heater for greenhouses, baths, laundries, &c., or for surface condensing or cooling. In

short, it may be used for the transfer of heat from any liquid, vapor, or gas to any other.

I claim as my invention—

A boiler, composed of a number of horizontal sections, placed one on the other, said sections having raised outside rims, inclosing shallow air-spaces, into which open the mouths of numerous vertical air-passages through the sections, the air-passages being surrounded by water-spaces communicating with each

other, and with those of adjoining sections, through necks, as described, so that when bolted together, vertical and branching air-flues are formed, intermediate with which are a suitable number of vertical water and steam passages, substantially as described.

A. KIPP, JR. [L. S.]

Witnesses:

RUSSEL BARNUM,
H. PALMER.