J. A. REED.

SECTIONAL STEAM-GENERATOR.

No. 192,389. Patented June 26, 1877.

Fig. 1.

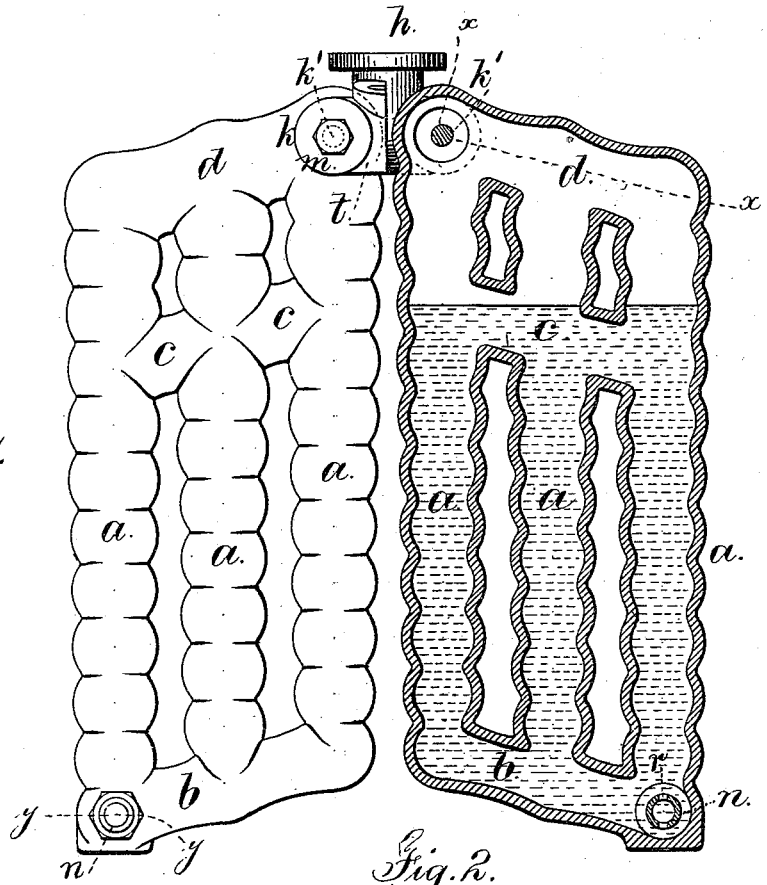

Fig. 2.

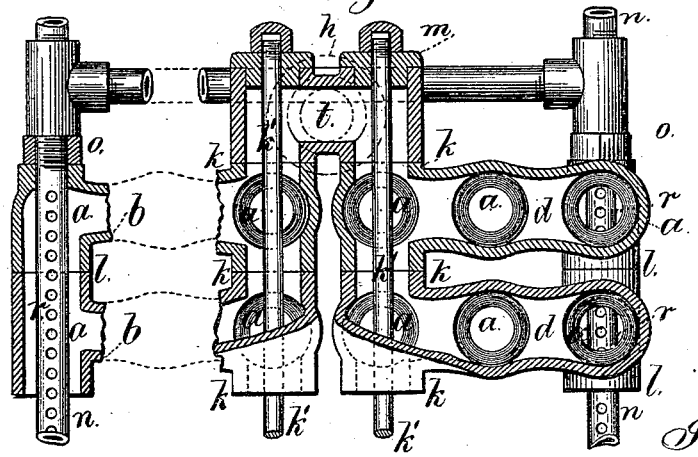

Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN A. REED, OF DUNELLEN, NEW JERSEY, ASSIGNOR TO REED'S SECTIONAL SAFETY BOILER COMPANY, OF NEW YORK, N. Y.

IMPROVEMENT IN SECTIONAL STEAM-GENERATORS.

Specification forming part of Letters Patent No. **192,389**, dated June 26, 1877; application filed September 21, 1876.

To all whom it may concern:

Be it known that I, JOHN A. REED, of Dunellen, in the county of Middlesex and State of New Jersey, have invented an Improvement in Sectional Steam-Generators, of which the following is a specification:

In Letters Patent No. 148,757, granted to me, ranges of tubes are shown, each tube being made of a series of hollow spheroids, connected at top and bottom by lateral pipes.

My present invention relates to a sectional boiler, made of flat ranges of vertical pipes cast together, with inclined connecting-pipes at top and bottom and near the water-line, and these ranges are placed flatwise together, and connected by transverse pipes, the lower ones serving for the supply of water and the upper ones for the steam.

These ranges are placed over the fire in such a manner that the heat circulates among and between them.

In the drawing, Figure 1 is an elevation of one of the ranges and a section of the adjacent range. Fig. 2 is a sectional plan at the line *x x*, and Fig. 3 is a sectional plan at the line *y y*.

The vertical pipes *a a* are made as a series of hollow spheroids of the general character shown in my aforesaid patent, and with the same objects in view; but, instead of being separate from each other, they are cast in ranges of two or more, with the connecting-pipes *b c d*. These pipes are all inclined so that when the ranges of pipes *a* stand vertical these pipes *b c d* will be inclined upwardly toward the middle of the furnace, as seen in Fig. 1, the object of this arrangement being to insure a rapid circulation of the water in each section or range. The heat causes the water to rise in the vertical pipes *a* that are near the center over the fire, and descend through the more distant pipes *a*, and return by the upward-inclined pipes *b*. The pipes *c* being below the water-level, insure the circulation as aforesaid, and the pipes *t* receive and convey away the stream to the common discharge-pipe *h*.

The respective sections formed by the ranges of pipes *a b c d* are provided with lateral outlets formed by the collars *k* and *l*, the surfaces of which are dressed off true, so that they will not leak after they are bolted together.

I remark that these sections are each to be cast in one piece, and upon sand cores that are afterward removed.

At the pipe *d* the collars *k* are held together by the central tie-bolt *k'* passing through the end disks or bridges *m*, so that the steam-way is entirely unobstructed, and extends to the delivery steam-pipe *d*.

At the collars *l* the wrought-iron pipe *n* is inserted transversely through the sections, and it becomes the hollow bolt for the nuts *o*, by means of which the sections are confined together, and the surfaces of *l* pressed to each other tightly. This pipe *n* is perforated at each section by holes at *r*.

It will now be evident that the pipe *n* does not prevent the circulation of the water within the sections, and that if the feed-water is supplied through the pipe *n* the same will be distributed equally in the boiler by passing through the holes *r*, thus preventing the unequal expansion or contraction of the boiler.

Blow-off cocks are to be connected to the pipes *n* so as to convey away any sediment that may accumulate in the boiler.

If the pipes *c* have flanges or ribs along their outer surfaces to come into contact with those of the next pipe *c*, a partition may thus be formed in the fire-chamber for an upper return-flue.

I am aware that steam-generators have been made of vertical ranges of pipes, connected by horizontal pipes, and that these have been made of ranges of hollow spheroids. In these cases the circulation of the water is not as rapid and reliable as in my present generator, because the lower pipe *b* is inclined upwardly, in the direction in which the water circulates as it becomes heated, and the pipe *c* is inclined downwardly for the return circulation.

I claim as my invention—

The steam-generator formed of the ranges of vertical tubes *a*, connected in sections by the upwardly-inclined circulating-tubes *b*, downwardly-inclined return circulating-tubes *c*, and steam-tubes *d*, all made as ranges of hollow spheroids, and the sections connected together side by side, substantially as set forth.

Signed by me this 16th day of September, A. D. 1876.

JOHN A. REED.

Witnesses:
GEO. T. PINCKNEY,
CHAS. H. SMITH.