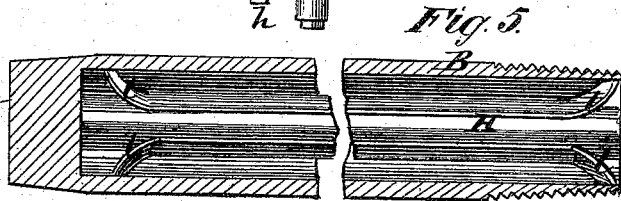
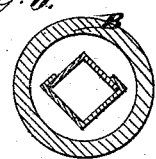
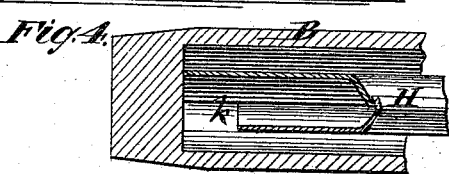
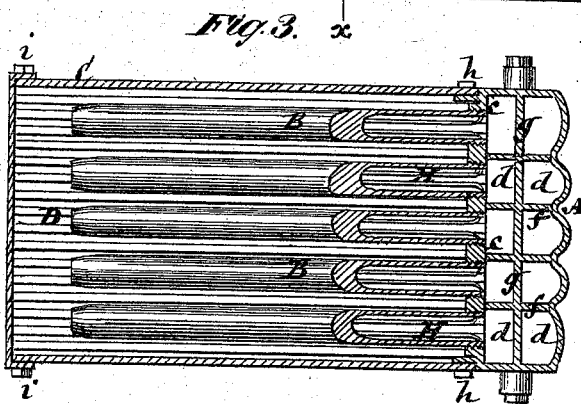
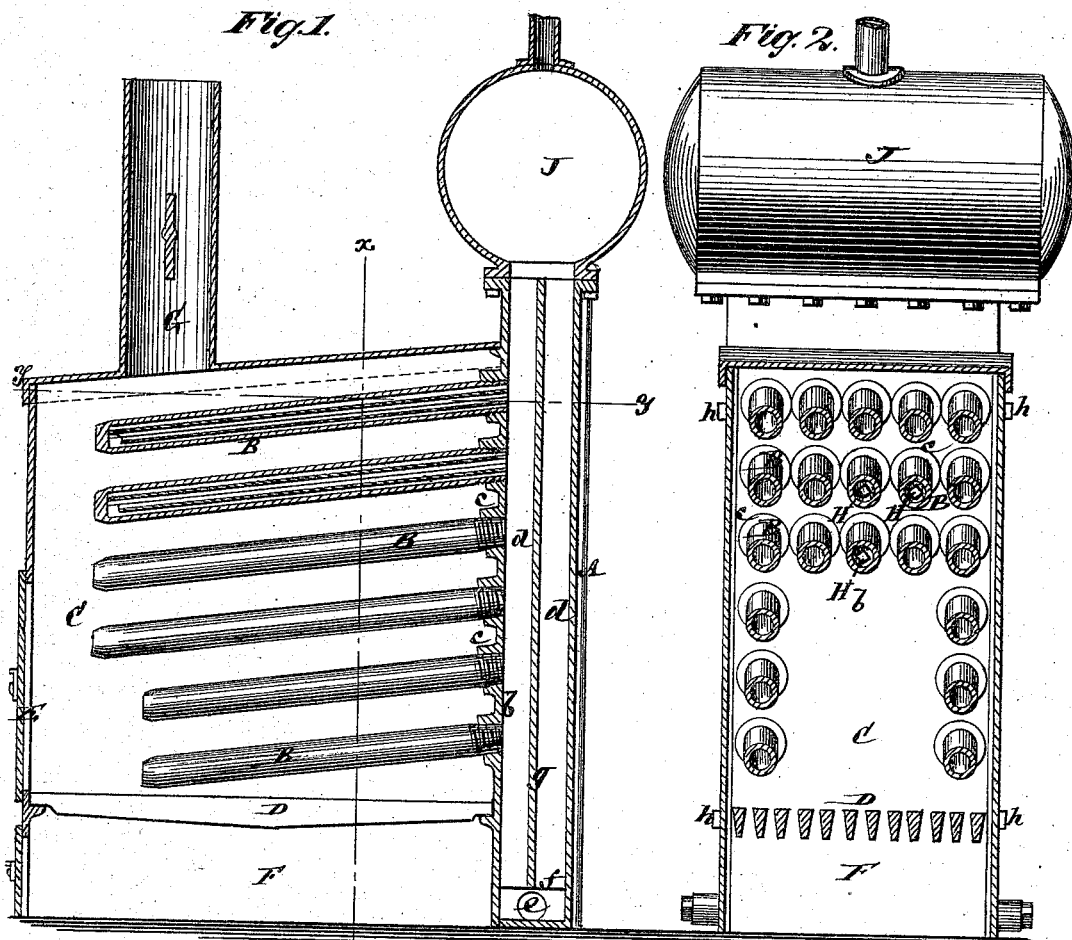


H. F. KING.
Sectional-Boiler.

No. 162,928.

Patented May 4, 1875.



Witnesses
John Becker
Fred Haynes

H. F. King
by his Attorneys
Pomeroy & Allen

UNITED STATES PATENT OFFICE.

HENRY F. KING, OF CORRY, PENNSYLVANIA.

IMPROVEMENT IN SECTIONAL BOILERS.

Specification forming part of Letters Patent No. 162,928, dated May 4, 1875; application filed February 4, 1875.

To all whom it may concern:

Be it known that I, HENRY F. KING, of Corry, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification.

This invention has for its object to furnish a steam-boiler which is complete in itself and portable, whereby it can be carried or transported from place to place, and whereby a perfect circulation of water is secured.

The invention consists of an upright water-back made in one piece, and provided with a series of vertical stay-plates arranged parallel with each other, and running in the direction of the length of the boiler. Between each of said stay-plates, at the center of the same, is arranged a metal strip, which divides the space between the stay-plates into a series of inner and outer passages for the circulation of water. Each vertical row of water-tubes communicates with the inner vertical water-passages, all of which will be hereinafter described.

The boiler may either be constructed of cast-iron or of wrought and sheet metal combined, or of all three.

Figure 1 represents a vertical longitudinal section of a boiler constructed in accordance with my invention, and with its upright or back as made of cast-iron. Fig. 2 is a transverse vertical section of the same on the line *x x*; Fig. 3, a horizontal section on the line *y y*. Fig. 4 is a vertical section upon a large scale of the blind-end portion of one of the tubes provided with a circulating-passage. Fig. 5 is a horizontal section of said tube, and Fig. 6 a transverse section thereof.

A is the water upright or back, which, when made of cast-iron, may have its front plate *b* vertical, with sockets *c* on it for the open ends of the blind tubes B to screw into, giving them a downward dip toward their outer closed or blind ends, to provide for circulation of the water and escape of the steam as formed. When the upright or back A, however, has its front plate *b* of sheet-iron, the latter may be set to incline forwardly in an

upward direction, so as to be at right angles to the tubes B. The tubes B are of a tapering construction at their inner threaded ends, to make a close or tight fit with the plate *b* or its sockets *c*, and are of squared or angular construction externally on their outer or blind ends, to facilitate the ready detachment of each tube when required. The blind tubes B are arranged in rows one above the other, and, when disposed in a fire-box, C, have a less number of lower tubes, and these only arranged down the sides of the fire-box and foreshortened, or certain of them foreshortened, to form a fuel-space, as clearly shown in Figs. 1 and 2 of the drawing. The upright water section or back A is constructed with upright circulating-passages *d d* for each or any of the vertical rows of tubes B, the feed-water being introduced by a lower inlet, *e*. When the upright section A is of cast-iron, the circulating-passages *d d* are formed by vertical stays *f* cast to the upright, running in direction of the length of the boiler, and by metal strips *g* sprung in between the stays. When a wrought-iron upright section is used, then tubes may be used to effect the circulation, and stay-bolts be introduced between the tubes. The fire-box C may also be constructed with a water-front, and, if desired, with water-sides; but such forms no part of this invention; and a plain fire-box only is shown, constructed in sections—that is, with its sides secured to the upright A by any number of cross-bolts, *h*, and its front secured to the sides by any number of cross-bolts, *i*, so that either the front may only be removed to get at any of the tubes B without disturbing the rest; or the whole fire-box may be removed for the same purpose. D is the grate of the fire-box; E, its fire-door; F, the ash-pit, and G the chimney.

Circulating-tubes H, with their lower portions foreshortened, as at *k*, may be introduced, and be supported centrally by bent ends *l* within the tubes B, to promote the circulation of the water and free escape of the steam when required.

J is a steam-drum arranged on top of the upright A. Both the inside and outside tubes, when inner circulating-tubes are used, may

be of any suitable shape in their transverse section. The blind tubes B may be closed either by plugs and welding or by screw-caps.

I claim—

The upright water-back A, made in one piece, and constructed with a series of vertical longitudinal stay-plates, *f*, and a series of transverse metal strips, *g*, arranged centrally between said stay-plates, whereby the water-back is provided with a series of inner and

outer water-passages, *d d*, for each row of tubes, as described, in combination with the inclined blind tubes B, projecting from the water-back, and each vertical row of the same communicating with one of the inner water-passages *d*, as set forth.

HENRY F. KING.

Witnesses:

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