

(No Model.)

2 Sheets—Sheet 1.

J. F. GRAY.

STEAM BOILER.

No. 305,073.

Patented Sept. 16, 1884.

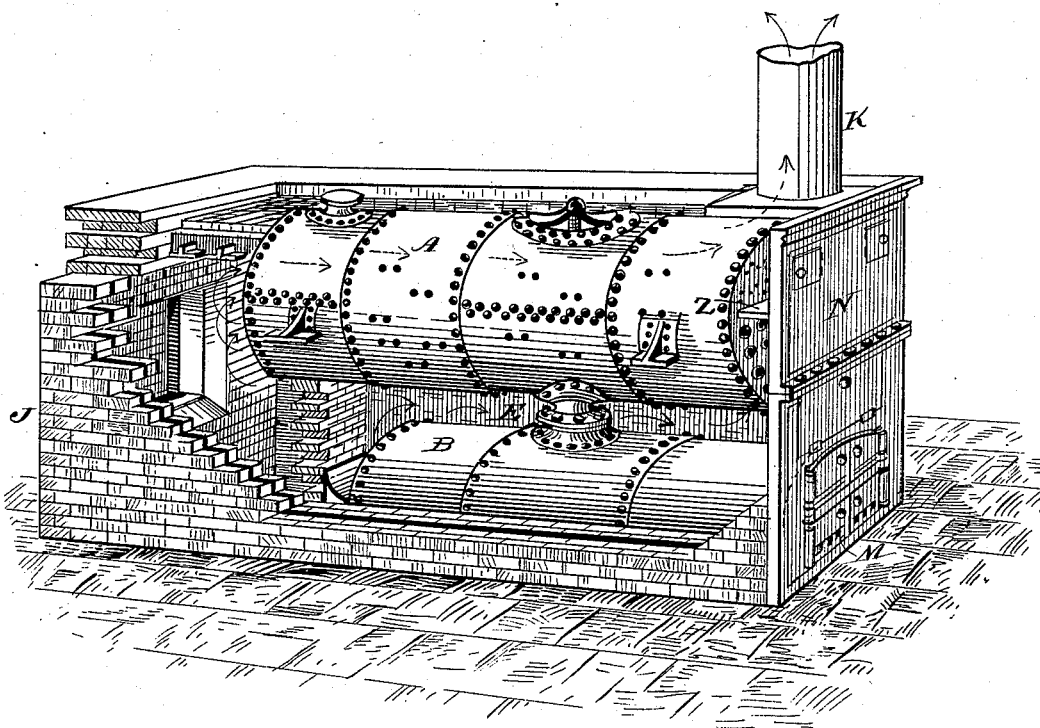


Fig. 1.

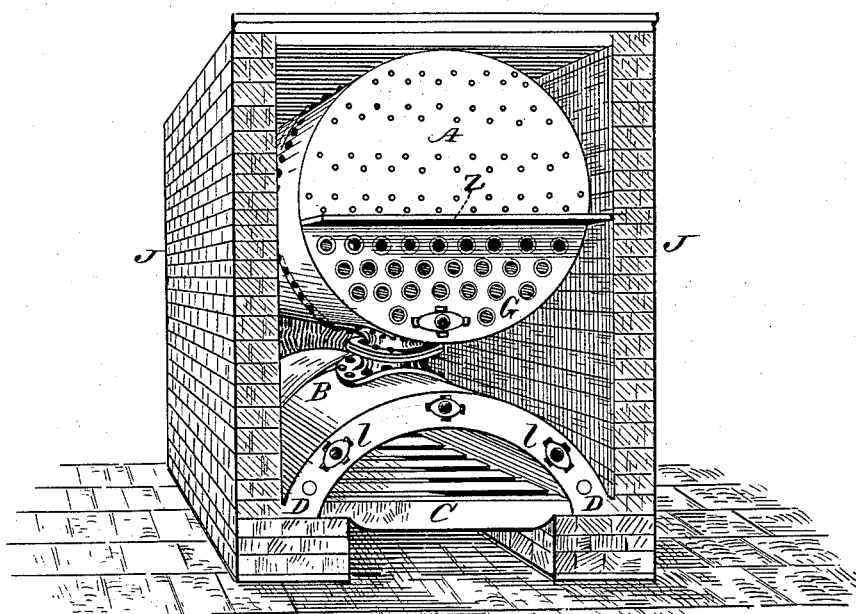


Fig. 2.

Witnesses:
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L. J. White

Inventor:
John F. Gray,
Per C. A. Shaw, atty

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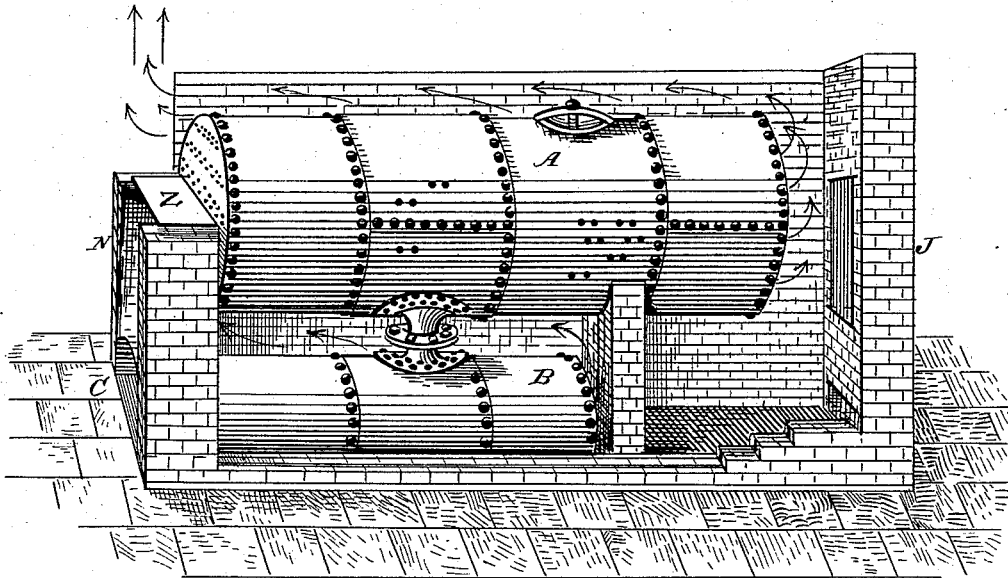


Fig. 3.

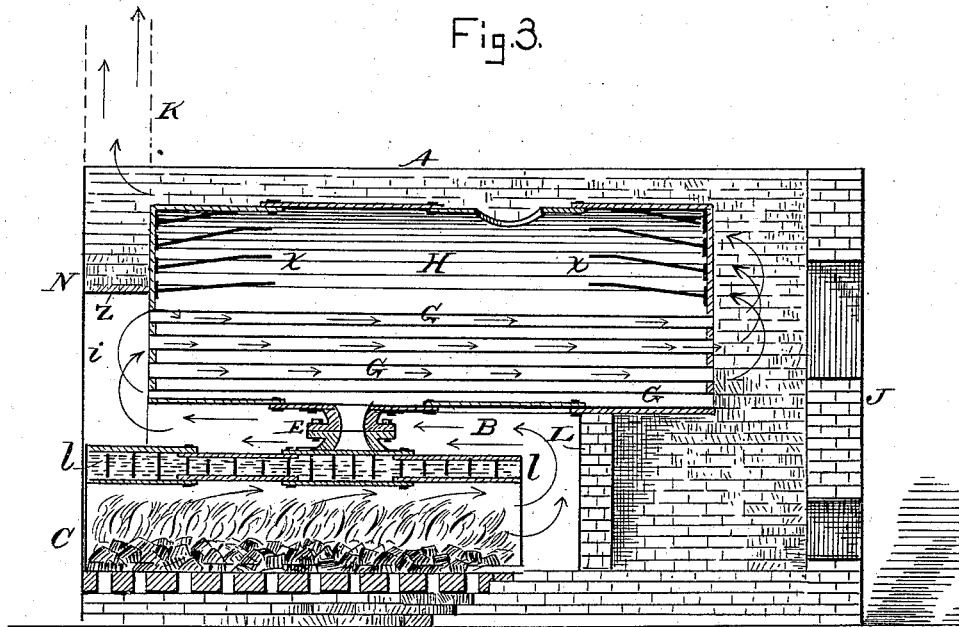


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN F. GRAY, OF WORCESTER, MASSACHUSETTS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 305,073, dated September 16, 1884.

Application filed April 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. GRAY, of Worcester, in the county of Worcester, State of Massachusetts, have invented a certain new and useful Improvement in Steam-Boilers, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an isometrical perspective view of my improved boiler; Fig. 2, a rear end elevation of the same in perspective; Fig. 3, a side elevation, and Fig. 4 a vertical longitudinal section.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to that class of steam-boilers in which there is a water-jacket surrounding a portion of the fire-box; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a more effective device of this character is produced than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation:

In the drawings, A represents the body or main boiler, and B the jacket. The jacket consists of a double-walled arch or segment, which spans the grate C, and rests on the jambs D, the arched jacket being closed or provided with a proper head, *l*, at either end. The main boiler A is disposed directly above the jacket, which forms the arch to the fire-box, and is connected therewith by the hollow couplings E in such a manner as to afford a free circulation of water between the jacket and superposed boiler. The main boiler is constructed in the usual manner, and provided with a series of horizontally-arranged tubes, G, having a steam chamber or space, H, above them, the heads of the

boiler being braced, as shown at *x*. The boiler and jacket are incased in brick-work J, to form a furnace, and provided with a chimney, K. The water-jacket and fire-box are preferably about two-thirds the length of the main boiler, and disposed at the rear of the fire-box, which is open at its inner end, there is a transverse wall or partition, L, on which the rear end of the main boiler rests, the jacket B constituting a supplemental or auxiliary boiler.

In the use of my improvement water is forced into the main boiler, in the usual manner, by any suitable feed-pump, from whence it will pass through the coupling E into the jacket B. When the jacket is full and there is a sufficient quantity of water in the boiler A, a fire is started on the grate C, proper doors and dampers, M, being provided to regulate the draft and gain access to and close the fire-box as required. A fire having been started, as described, the flame, smoke, heated air, and other products of combustion will pass out of the inner end of the fire-box against the wall L, by which they will be deflected and turned back, passing under the boiler A to the front of the furnace; thence through the tubes G to the rear of the furnace; thence back again over the top of the boiler to the front of the furnace, and out of the chimney K. A horizontally-arranged stop or partition, *z*, is placed across the space *i*, between the front end of the boiler A and the furnace-front N, thereby closing the flue at that point and deflecting or turning the current of heated air, &c., into the tubes G, and preventing it from passing directly into the chimney, the sides of the boiler coming into close contact with the brick-work J, and thereby preventing the air from passing upwardly between the sides and walls of the furnace.

It will be understood that the boiler is provided with the necessary man-holes, hand-holes, &c., and is otherwise properly constructed.

It will also be obvious that the water-evaporating surface of my improved boiler is very largely in excess of ordinary boilers of

this character, and that the heat from the fire-box is utilized to the best advantage in producing steam, thereby effecting a large saving in fuel.

5 In case of necessary repairs to the jacket, it may be readily detached from the main boiler by uncoupling the connections E.

Having thus explained my invention, what I claim is—

The boiler A, jacket B, and coupling E, in combination with the casing J, wall L, partition z, front N, and chimney K, constructed and arranged to operate substantially as set forth.

JOHN F. GRAY.

Witnesses:

CHARLES A. MERRILL,
JAMES J. DOWD.