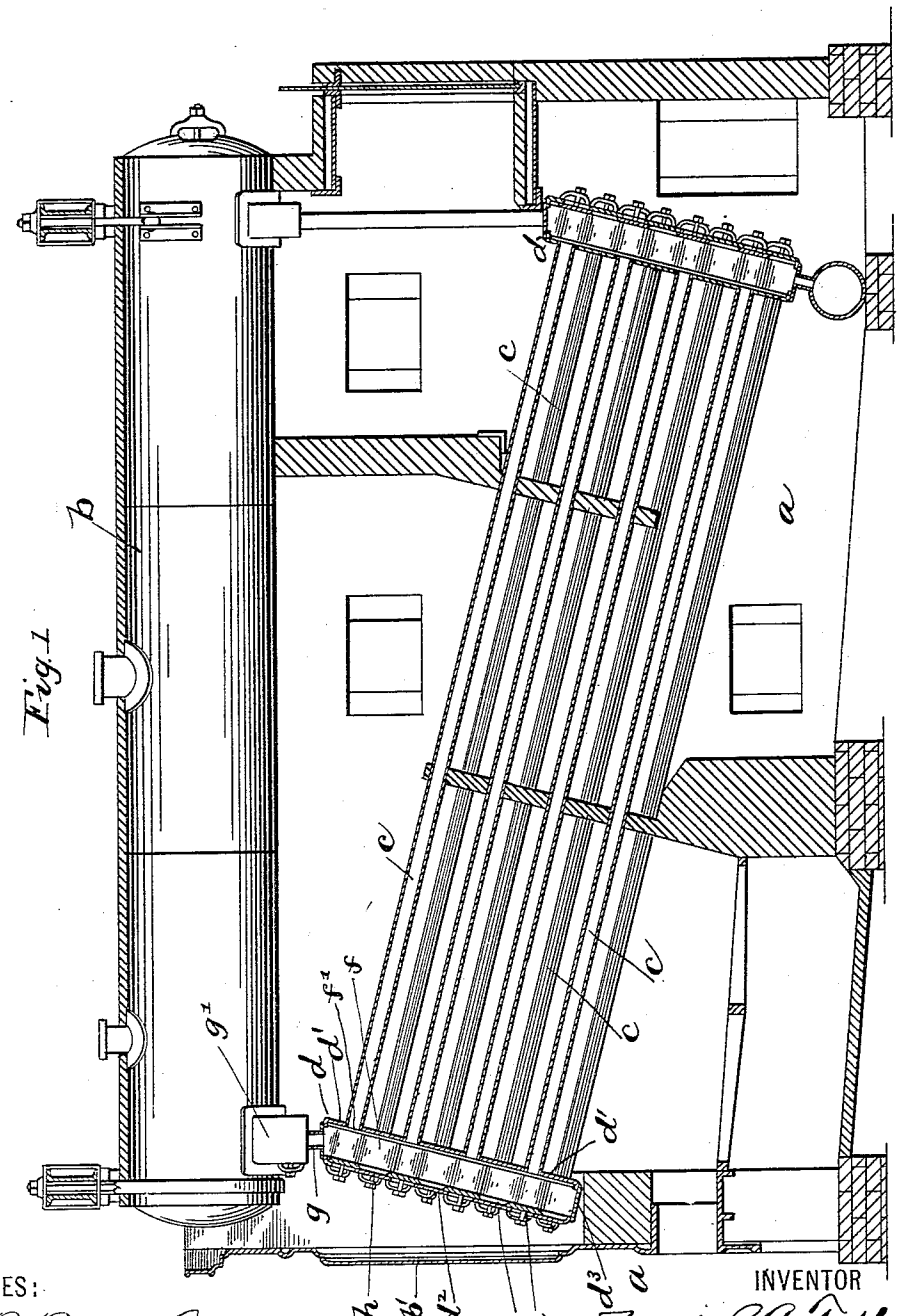
No Model.)

2 Sheets—Sheet 1

J. A. TAFT.

STEAM BOILER.

No. 559,915. Patented May 12, 1896.



WITNESSES:

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A. L. Phelps

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(No Model.) 2 Sheets—Sheet 2.

J. A. TAFT.

STEAM BOILER.

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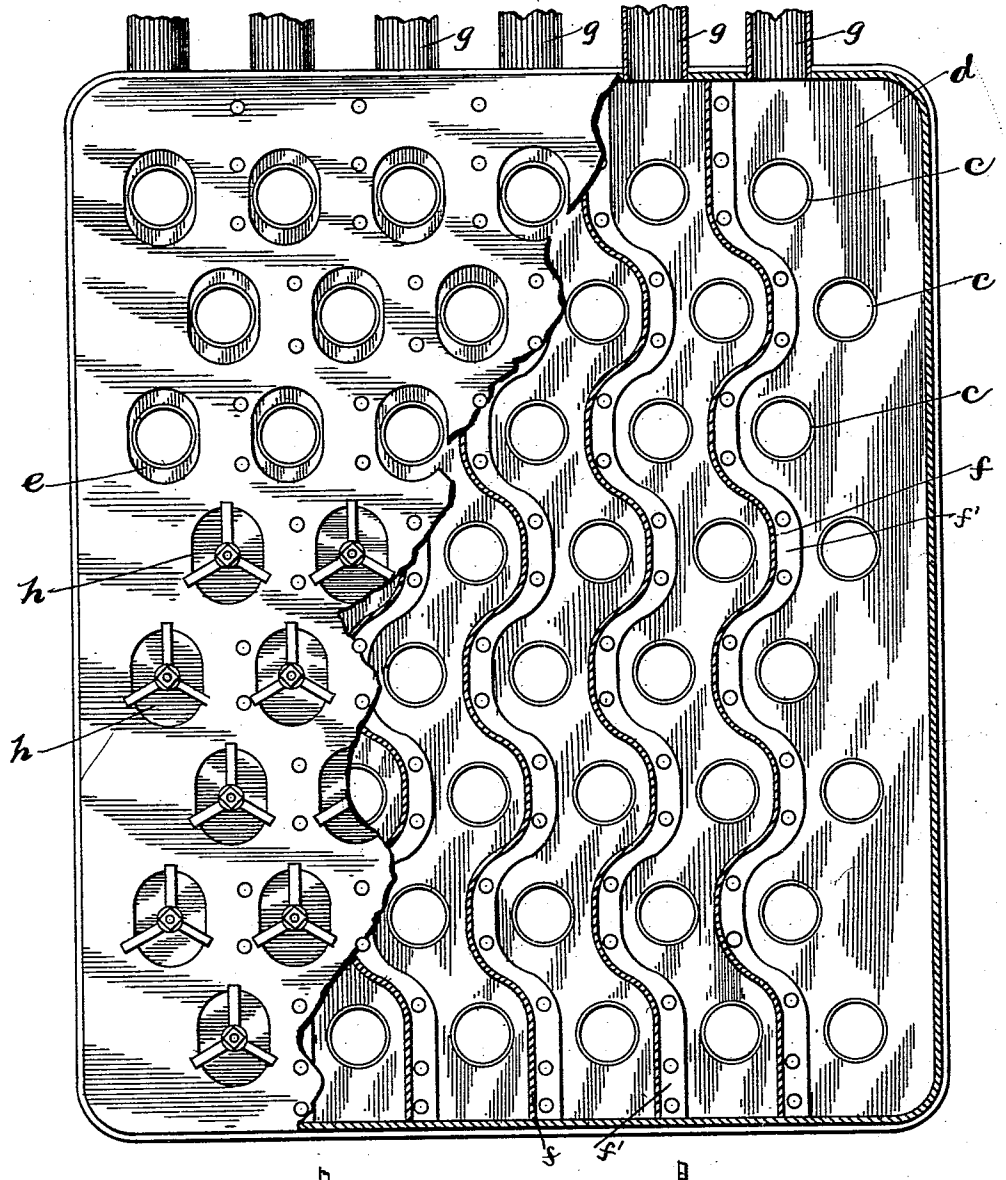
Fig. 2



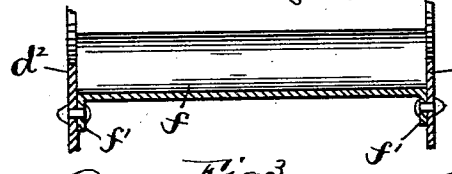


Fig. 3

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UNITED STATES PATENT OFFICE.

JOSEPH A. TAFT, OF COLUMBUS, OHIO.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 559,915, dated May 12, 1896.

Application filed July 19, 1895. Serial No. 556,466. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. TAFT, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Steam-Boilers, of which the following is a specification.

My invention relates to the improvement of steam-boilers and has particular relation to the improvement of water-tube boilers.

The objects of my invention are to provide improved heads or water-legs for the tubes of a boiler of this class, to so construct said heads as to render the same strong and durable, and to produce other improvements in details of construction, which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section of a furnace and boiler having my improvement therein. Fig. 2 is an end view of a water-tube boiler, showing, for the sake of illustration, a portion of the outer head sheet or plate broken away; and Fig. 3 is a transverse section through one of the head-partitions.

Similar letters refer to similar parts throughout the several views.

a represents the furnace-frame, which may be of any desirable or well-known construction.

b represents the water and steam drum, which is located, as in the usual manner, in the upper portion of said furnace, and *b'* is the front doorway, through which access is gained to the boiler-head in the usual manner.

c represents a set or bank of boiler-tubes, which, as indicated in the drawings, are supported in the usual inclined position within the furnace.

As indicated more clearly in Fig. 2 of the drawings, the boiler-tubes *c*, although arranged in horizontal rows, are staggered with reference to their vertical arrangement.

My improved heads are, as shown, substantially in the form of oblong casings or boxings *d*, of which *d'* is the inner or back sheet, and d^2 is the front or outer sheet, which is parallel therewith. The lower edges of these sheets are connected by a bottom plate d^3 and the upper edges by a top plate d^4. The forward ends of the tubes *c* are, as indicated in the drawings, made to communicate with the interior of the forward head *d* by fitting in openings formed in said inner sheet *d'*, said openings having an arrangement corresponding with the arrangement of said tubes. The front or outer sheet d^2 of the head is provided with the usual openings *e*, through the medium of which access is ordinarily gained to the tubes, these openings *e* being in alinement with the ends of said tubes. Between each of the vertical and staggered rows of tube-openings I provide a vertical and sinuous partition *f*, the latter extending between the inner surfaces of the inner sheet *d'* and outer sheet d^2 and being provided with outturned flanges *f'* at each edge, which said flanges are, as indicated in the drawings, riveted to said inner and outer plates. These partitions, which are thus made substantially channel shape in cross-section, as indicated in Fig. 3 of the drawings, I form of wrought iron or steel. Owing to the fact that the partitions are arranged, as shown in the drawings, to extend between the vertical and staggered rows of tube-openings from the upper to the lower side of the head, it will be seen that each of said vertical rows of tubes will open into a separate head-flue, and a tubular outlet *g* is provided through the upper side of the head for each of the flues thus formed, these tubular outlets in the case of the forward or front boiler-head communicating, as shown, with a saddle *g'*, which in turn communicates with the drum *b* in the usual manner.

The front sheet-openings *e*, which are preferably of the substantially oval shape shown, are adapted to be closed by suitable hand-hold-plates *h*, which may be removed when necessity requires it for the purposes of gaining access to the head or cleaning the tubes. Although the above description has been confined to the outer head at the outer or forward ends of the boiler-tubes, said description is applicable to the head *d*, with which the inner and lower ends of the tubes communicate, the construction of said inner head being substantially the same as that of the outer head, as shown in the drawings.

From the construction which I have shown and described herein it is obvious that the sinuous and channel-shaped partitions, ar-

ranged as described, will form strong, durable, and effective connections between the inner and outer sheets of the heads, thus greatly adding to the safety and efficiency of the latter.

It is evident that instead of employing rivets, as herein shown and described, for the purpose of connecting the partition-flanges with the head-sheets I may employ transverse bolts, the latter extending from one of said flanges to the other and passing through said sheets. The rivet connection, however, is deemed preferable.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

In a steam-boiler the combination with a set or bank of inclined boiler-tubes arranged in vertical staggered alinement, of a casing-head with which the corresponding ends of said tubes communicate, a vertically-arranged sinuous partition between each of said vertical rows of staggered tube ends, said partition being substantially channel shape in cross-section and having its edge flanges secured respectively to the inner surfaces of the outer and inner head-sheets, substantially as and for the purpose specified.

JOSEPH A. TAFT.

In presence of—
B. F. BOWEN,
R. R. MARBLE.