G. COOK.

LOCOMOTIVE BOILER.

APPLICATION FILED MAY 9, 1907.

936,607. Patented Oct. 12, 1909.

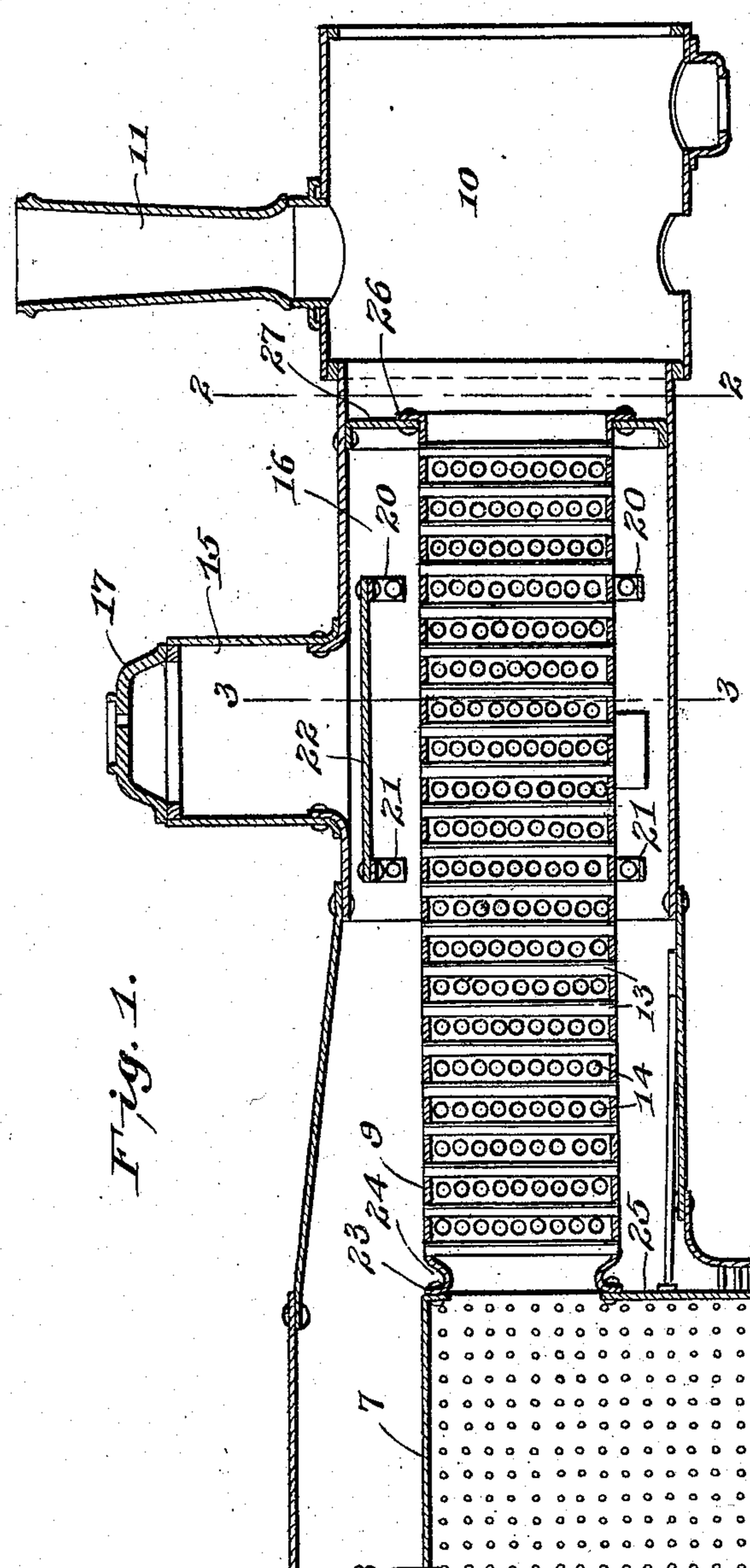

Fig. 1.

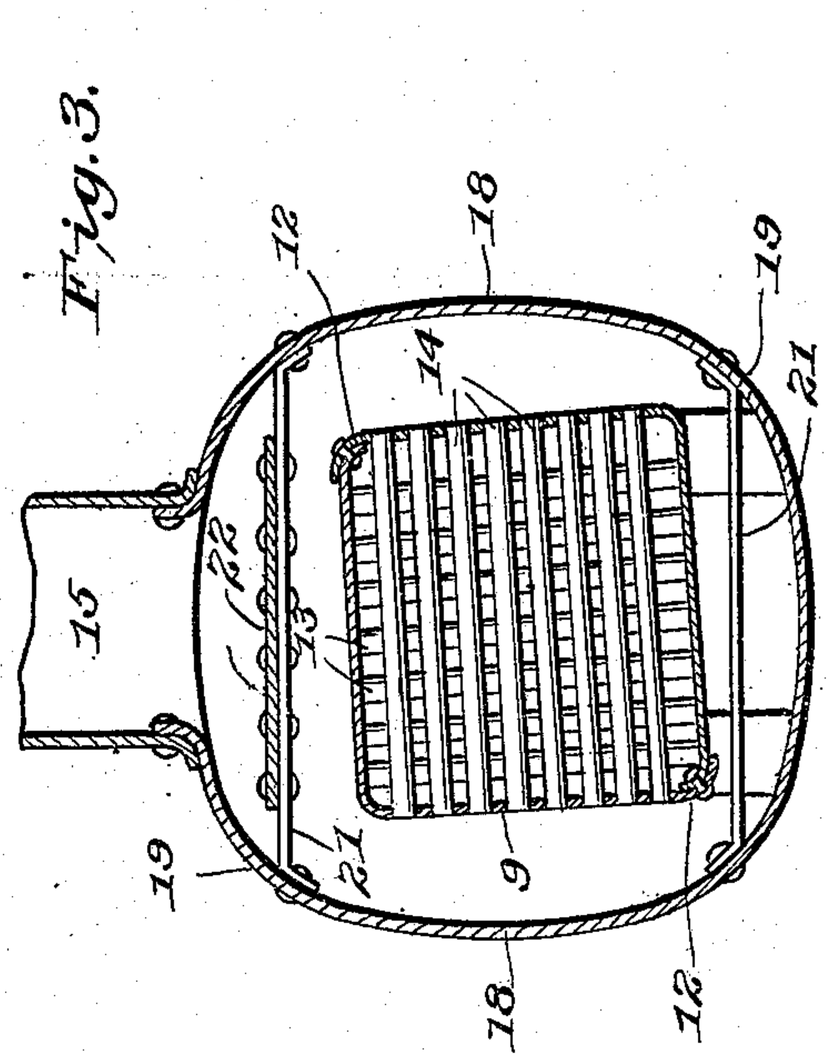

Fig. 3.

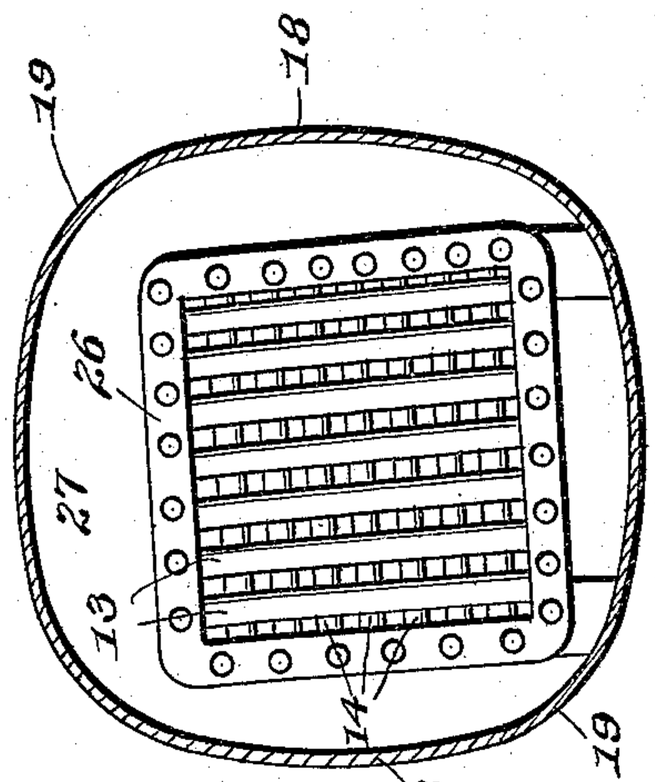

Fig. 2.

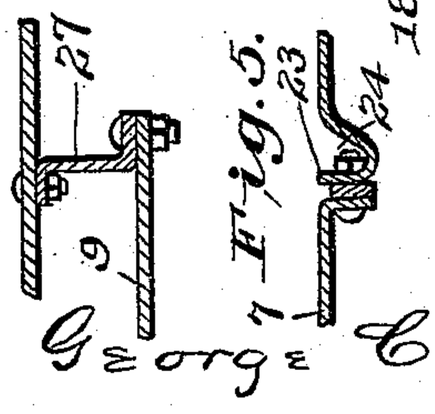

Fig. 4.

Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

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LOCOMOTIVE-BOILER.

936,607. Specification of Letters Patent. Patented Oct. 12, 1909.

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To all whom it may concern:

Be it known that I, GEORGE COOK, a citizen of the United States, residing at Elba, in the county of Genesee and State of New York, have invented certain new and useful Improvements in Locomotive-Boilers, of which the following is a specification.

My invention relates to steam boilers for locomotive engines and its general object is to generally improve their construction and operation.

A special object of my invention is to facilitate the assemblage of the parts of such boilers and their disassembling for purposes of replacement or repair.

A further object of my invention is to afford an improved and increased circulation in such boilers.

A further object is to increase the capacity of such boilers without materially increasing their outside dimensions.

With these objects in view my invention consists in the improved construction, arrangement and combination of parts hereinafter fully described and afterward specifically claimed.

In order to enable others skilled in the art to which my invention most nearly appertains to make and use the same, I will now proceed to fully describe a boiler of the class mentioned, which contains one embodiment of my invention, in connection with the accompanying drawing, in which—

Figure 1 is a longitudinal vertical section, Fig. 2 is a transverse vertical section on an enlarged scale taken on the line 2—2 of Fig. 1. Fig. 3 is a similar section, also on an enlarged scale, taken on the line 3—3 of Fig. 1, and Figs. 4 and 5 are sectional detail views of permissible modification in the construction of the boiler.

Like reference characters mark the same parts wherever they occur in the several figures of the drawing.

Referring specifically to the drawing 6 indicates the fire box which may be of any suitable or approved construction the upper or crown sheet thereof being shown at 7. The usual smoke flues 8 are provided through which the gases of combustion pass in the usual manner into and through an inner casing 9 and into and through the smoke-box 10 and smoke stack 11. The casing 9 is square in transverse section, the corners being slightly rounded, the shell being formed of two sheets lapped at diagonally opposite corners, as at 12, and riveted together, or, it may be, secured, with a packing between them, by bolts or in any suitable manner known to boiler-makers.

In the casing 9 are vertical and transverse water tubes 13, 14, secured by beading or other suitable methods, all of the ends of such tubes being open to permit of the free circulation of water therethrough during the operation of the boiler, and to facilitate this circulation, the tube casing 9 is set at a slight angle so that the transverse tubes 14 will be slightly inclined instead of exactly horizontal.

15 indicates the steam drum of any usual or approved construction, located as is usual, in communication with the steam space 16 of the boiler and preferably provided with a removable cap 17, so that easy access to the interior of the drum, and to the steam space of the boiler is afforded.

In order that the square tube casing 9 may be slightly larger than usual and thus afford correspondingly greater steaming capacity, I do not make the boiler shell of the usual circular transverse section, but make the curves of the sides of a greater radius so that they are apparently flattened, as at 18 in Fig. 2, there consequently appearing arcular corners 19 at the junction of such curves as clearly shown. This form more nearly approaches the square transverse form of the tube casing 9 and permits of the use, in a boiler shell of a given transverse sectional area, of a slightly larger square tube casing 9, thus increasing the length of the tubes 13 and 14 and correspondingly increasing the capacity of the boiler. This form of boiler shell is improved by bracing as at 20, 21, as clearly shown.

There being a circulation in the vertical tubes 13 and as a consequence a discharge of water and steam from their top ends, it is desirable to prevent such water and wet steam from entering the steam drum, which should contain only dry steam. In order to accomplish this result, I secure a baffle plate 22 to the braces 20, 21, immediately under the steam drum, upon which the upwardly discharged steam and water will strike and drop back, being prevented from entering the steam drum.

In order that the parts may be readily assembled or taken apart, I arrange the tube casing 9 so that it can be readily passed into the front end of the boiler shell, and to hold

it therein, I form an outwardly projecting flange 23 on its inner end, inside of which is a groove 24, so that the flange 23 does not project beyond the periphery of the tube casing. The casing can thus be readily passed into the shell until the flange 23 abuts against the rear plate 25 of the fire box, to which it may be secured by rivets or bolts, the heads of these being seated in the groove 24 and being entirely out of the way in passing in or removing the tube casing.

At the front end of the tube casing may be formed a flange, as at 26 which, when the tube casing is fully within the boiler shell, will abut against the plate 27 and may be secured thereto by rivets or bolts in any usual manner.

Modified forms of joints may be used to secure the tube casing in the shell, a joint for the front end being shown in Fig. 4 and a joint for the rear end in Fig. 5. The construction of these joints will be readily understood by those skilled in the art and a detailed description is not deemed necessary.

While I have specifically described the construction and arrangement of the various parts of the boiler, I do not wish to confine myself to such exact constructions, as it will be readily understood that many modifications thereof, or variations therefrom, may be made without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim as new is:—

1. A boiler shell, having its sides transversely curved and connected by transversely curved corners, each side being curved on a radius greater than that of a circle circumscribed about the shell and touching the corners and the radius of each corner being not greater than that of said circle, in combination with an inserted tube casing square in cross section, with its sides, top and bottom lying within the corresponding portions of the shell, substantially as described.

2. In combination, a boiler shell, a steam drum, a tube casing in the shell, water tubes in the casing opening opposite the steam drum, and a baffle plate in front of the discharge end of said tubes and between said discharge ends and the steam drum, substantially as described.

3. In combination, a boiler shell, a tube casing therein, water tubes in the casing, a steam drum opposite the discharge ends of said tubes, transverse braces in the boiler shell adjacent to the steam drum, and a baffle plate of less width than the length of said braces secured on said braces between the steam drum and the discharge ends of the water tubes leaving openings at the ends and sides of the baffle plate for passage of steam to the drum, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE COOK.

Witnesses:

S. Brashears,

George H. Luscombe.