

No. 791,947.

PATENTED JUNE 6, 1905.

J. RODRIGUEZ Y FONOLL.

BOILER.

APPLICATION FILED SEPT. 28, 1904.

2 SHEETS—SHEET 1.

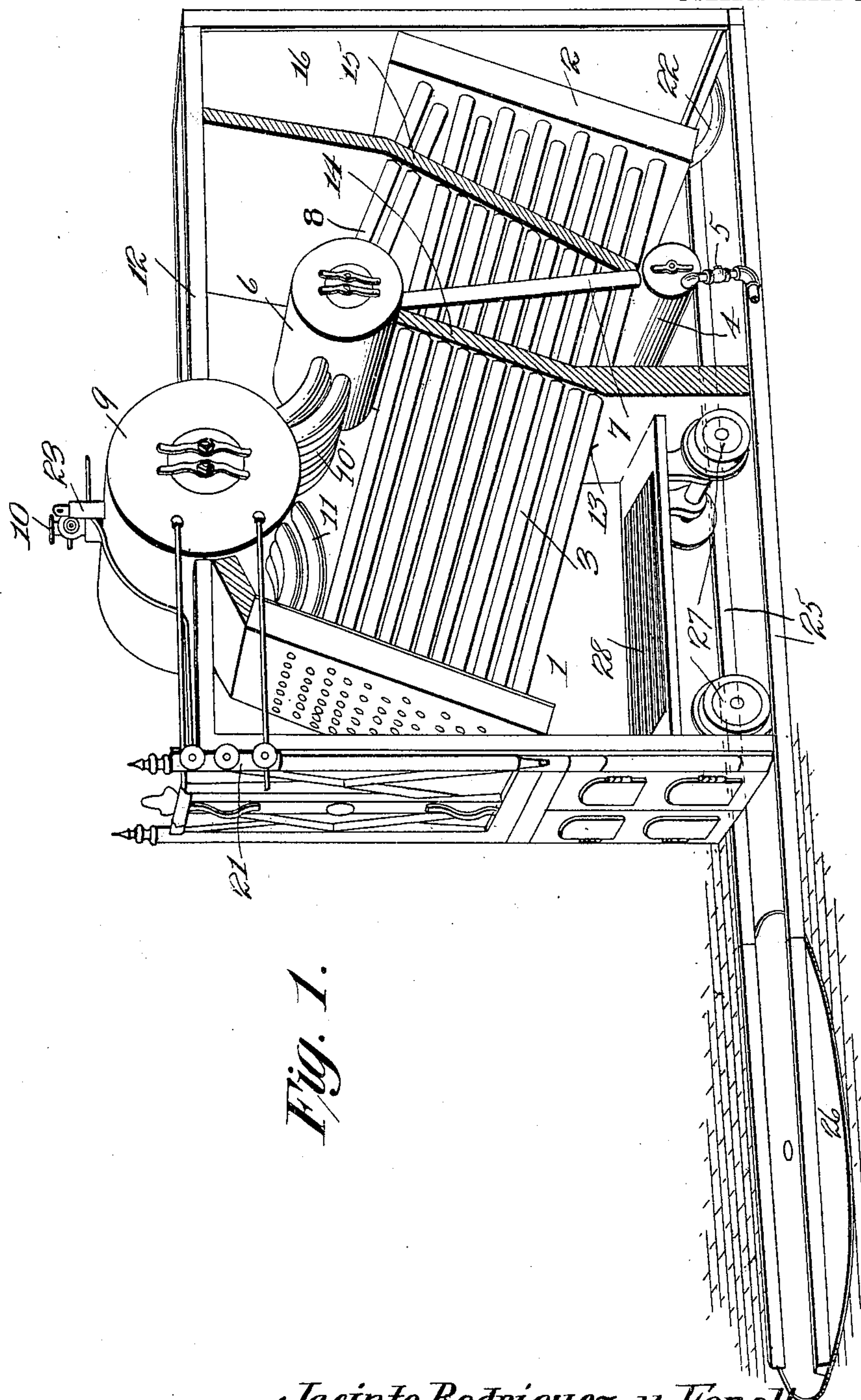


Fig. 1.

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Witnesses

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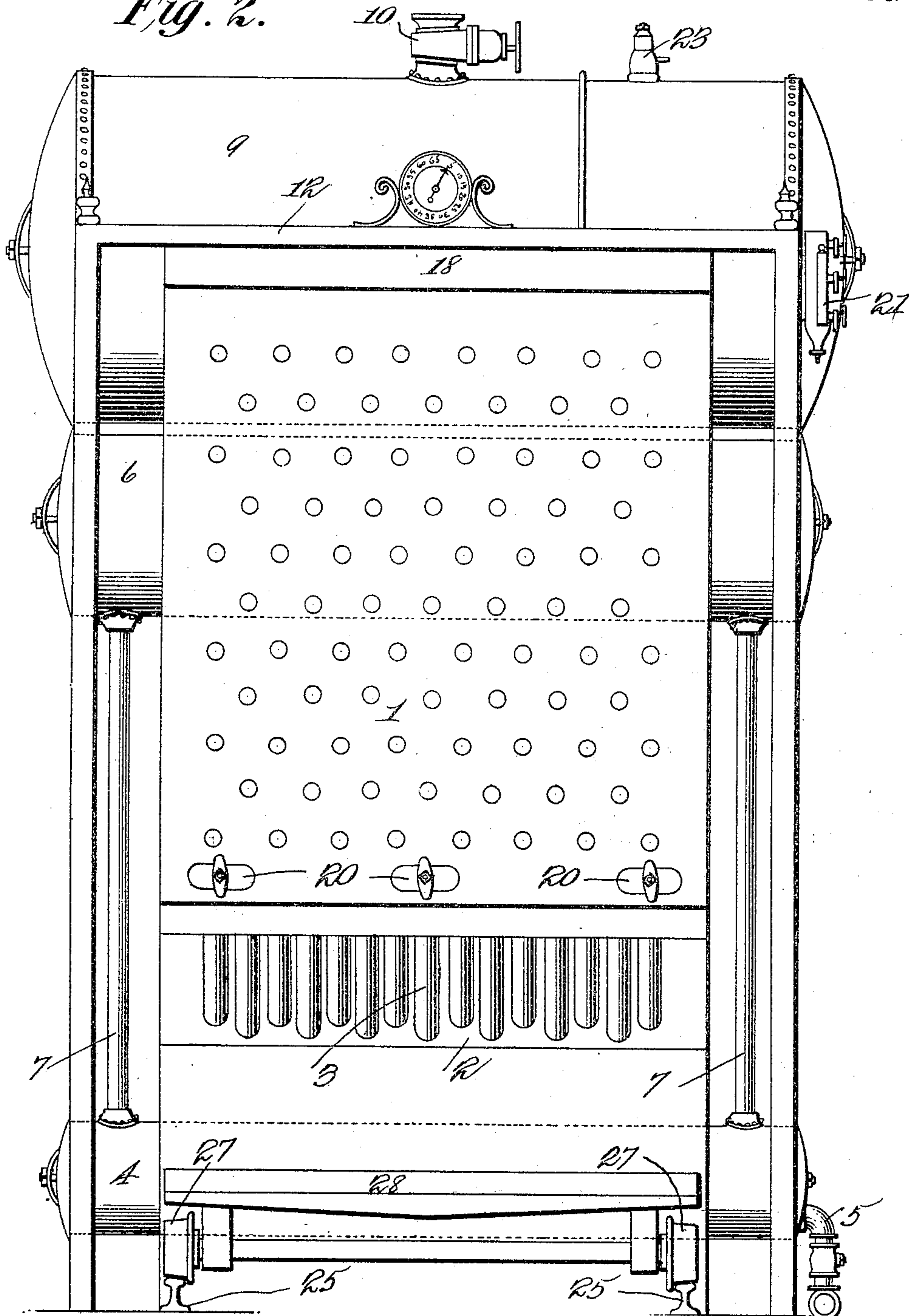
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

JACINTO RODRIGUEZ Y FONOLL, OF CIENFUEGOS, CUBA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 791,947, dated June 6, 1905.

Application filed September 28, 1904. Serial No. 226,380.

To all whom it may concern:

Be it known that I, JACINTO RODRIGUEZ Y FONOLL, a citizen of the Republic of Cuba, residing at Cienfuegos, Cuba, have invented a new and useful Boiler, of which the following is a specification.

This invention relates to steam-boilers and steam-boiler furnaces, and has for one of its objects to provide a novel form of water-tube boiler in which the heat of the products of combustion will be fully utilized.

A further object of the invention is to construct a water-tube boiler so arranged and connected with a plurality of intervening drums as to permit the effective circulation of the water.

With these and other objects in view, as will more fully hereinafter appear, the invention consists of the novel construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a perspective view of a steam-boiler constructed in accordance with the invention. Fig. 2 is a face view of the same with the front casing removed in order to more clearly illustrate the construction.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The front header 1 and rear header 2 are approximately rectangular in form and are connected by water-tubes 3 in the usual manner to the two sides of the headers and arranged at an oblique angle. At a point below the rear portion of the tubes 3 is a transversely-disposed drum 4, into which the feed-water is forced through a pipe 5, provided with the usual controlling-valves, and at a point above and at about midway of the length of the tubes is an intermediate circulating-drum 6, that is connected to the lower entrance-drum 4 by means of side tubes 7, one of such tubes being disposed on either side of

the main tubes. This intermediate drum is further connected to the top of the rear header 2 by means of a bank of tubes 8.

At a point near the front of and above the tubes 3 is a large transversely-disposed drum 9, forming a steam-dome in which the steam may be led off through a main 10 to the engine or the point of consumption. The front drum is connected to the intermediate drum by a bank of tubes 10 and is connected to the upper portion of the front header by a bank of tubes 11.

The several parts of the boiler are inclosed within a suitable wall or casing 12, and the bridge-wall 13 at the rear of the combustion-chamber is continued up to the lower edge of the intermediate drum 6, forming an inclined baffle-plate 14, so that all of the products of combustion from the chamber will be compelled to pass up through the space between the drums 6 and 9. To the rear of the baffle-plate 14 is a second baffle-plate 15, extending from the top of the lower feed-drum 4 to the top of the inclosing casing, and the products of combustion must therefore pass downward in contact with the tubes 3 and under the drum 4 and after again passing in contact with the tubes 3 escaping at the outlet 16 to the stack. At the front of the boiler is a transversely-disposed wall 18, extending between the top of the front header and the front portion of the drum 9, so as to prevent any of the products of combustion escaping from the top or front of the boiler. At the lower portion of the rear header are hand-holes closed in the usual manner, and the upper portion of the boiler is provided with the usual gage-cocks 21 for indicating the amount of water in the boiler. At the rear of the lower header is a blow-off pipe 22, through which any accumulations may be discharged, and at the top of the main drum 9 is a safety-valve 23, of the usual construction.

The products of combustion from the boiler pass upward from the combustion-chamber in contact with the tubes 3 and 10 and also impinging against the under side of the main drum 9, after which they are directed over the top of the intermediate drum 6 and thence downward between the two baffle-plates 14

and 15 to again come into contact with the tubes 3. The heated gases then pass down and under the inlet-drum 4 and thence upward to the rear of the baffle-plate 15 in contact with the rear ends of the water-tubes, and finally escape to the stack.

The water entering the inlet-drum 4 is compelled to pass upward through the inclined tube 7 to the opposite ends of the intermediate drum 6 and thence flows through the upper bank of tubes 8 to the rear header and from thence is directed upward and forward through the tubes 3 to the front header, from whence it passes through the front bank of tubes 11 to the front steam-drum 9, while communication between the drums 9 and 6 is established by means of the upper bank of tubes 10. This provides for the thorough circulation of the water, so that it may be subjected while in the tubes to the products of combustion, the course of the latter being such that the circulation is natural and the water heated from the time of its entrance to the inlet-drum to its final escape in the form of vapor through the main steam-pipe 10.

In the lower portion of the combustion-chamber is arranged a pair of rails 25, that extend outward on the floor of the boiler-house and lead to similar rails of a small turntable 26, that is arranged in a pit at the front of the boiler. On these rails is mounted a wheeled truck 27, carrying a grate 28, the latter being of any suitable construction in accordance with the character of the fuel to be employed.

In the operation the lower doors may be opened and the truck wheeled out at any time, and, if necessary, the truck may run onto the turntable and its position reversed before it is returned to said combustion-chamber. This permits of the thorough cleaning of the grate and facilitates repairs and at the same time is of advantage in that its removal will

permit entrance to the bridge-wall without rendering it necessary for the workmen to crawl over the grate-bars.

Having thus described the invention, what is claimed is—

1. In a steam-boiler, front and rear headers, obliquely-disposed water-tubes connecting the same, an inlet-drum disposed below the tubes, an upper steam-drum, an intermediate drum connected to both the inlet and steam drums, and tubes connecting the steam-drum to the front header.

2. In a steam-boiler, front and rear headers, obliquely-disposed tubes connecting the headers, a water-inlet drum, an upper steam-drum, an intermediate drum connected to both the water-inlet and steam drum, and baffle-walls disposed intermediate of the length of the tubes.

3. In a steam-boiler, front and rear headers, obliquely-disposed water-tubes connecting the headers, a pair of drums disposed one above and one below the tubes, and baffle-walls extending across the tubes and terminating at said drums.

4. In a boiler, the combination with the front and rear headers, of a plurality of obliquely-disposed water-tubes, a drum arranged above the line of tubes, a baffle-wall forming a continuation of the bridge-wall of the combustion-chamber and terminating at the drum, a water-inlet drum arranged to the rear of the bridge-wall and below the tubes, and a second baffle-wall extending upward from said inlet-drum to a point above the line of the tubes.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JACINTO RODRIGUEZ Y FONOLL.

Witnesses:

ANGEL CARAGOLL,
RAFAEL SÁNCHEZ.