

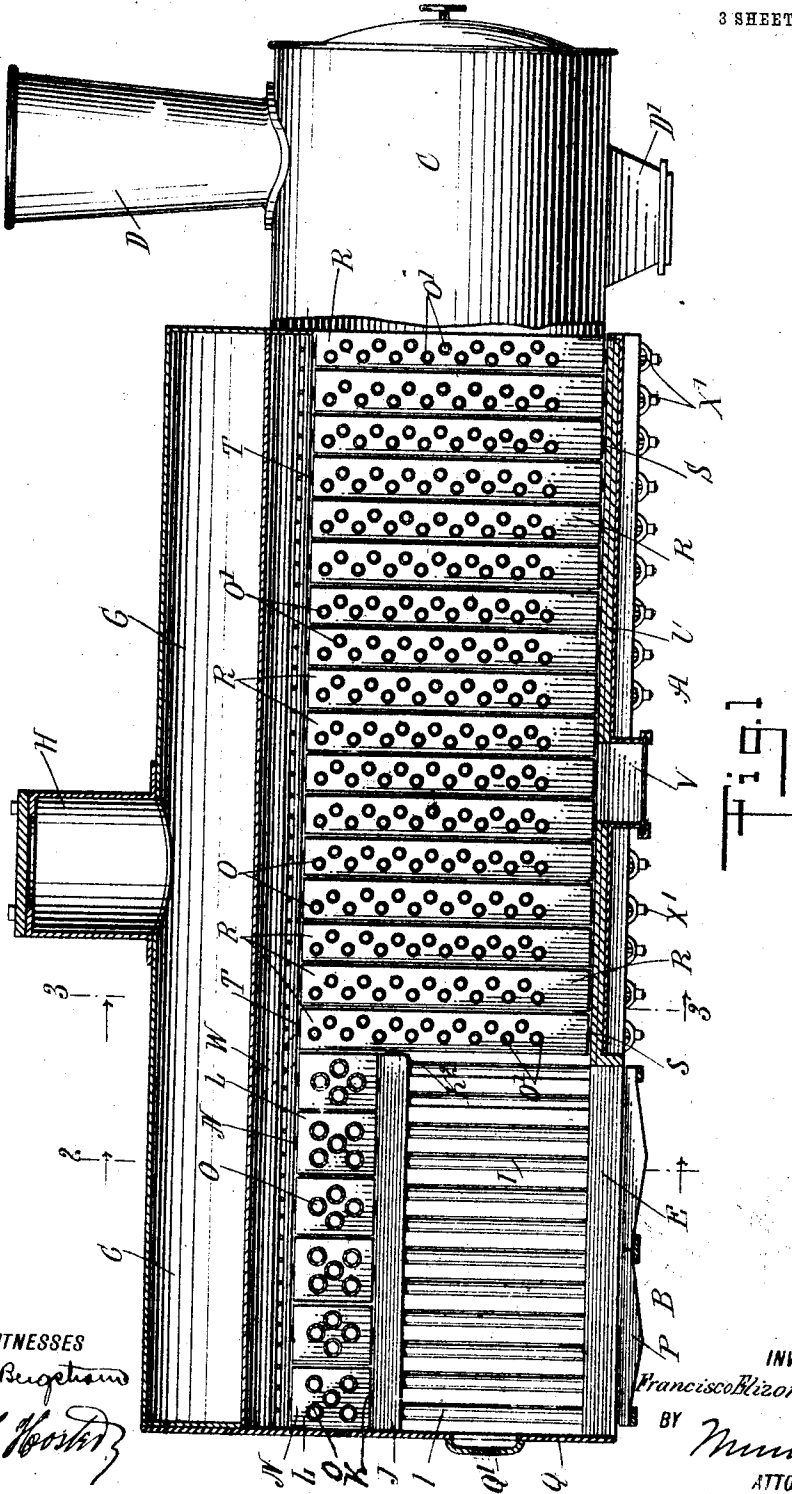
F. ELIZONDO.
BOILER.

APPLICATION FILED FEB. 26, 1912.

1,058,665.

Patented Apr. 8, 1913.

3 SHEETS—SHEET 1.



WITNESSES

John B. Beckett
Wm. H. Foster

INVENTOR

Francisco Elizondo

BY

Munroe
ATTORNEYS

F. ELIZONDO.

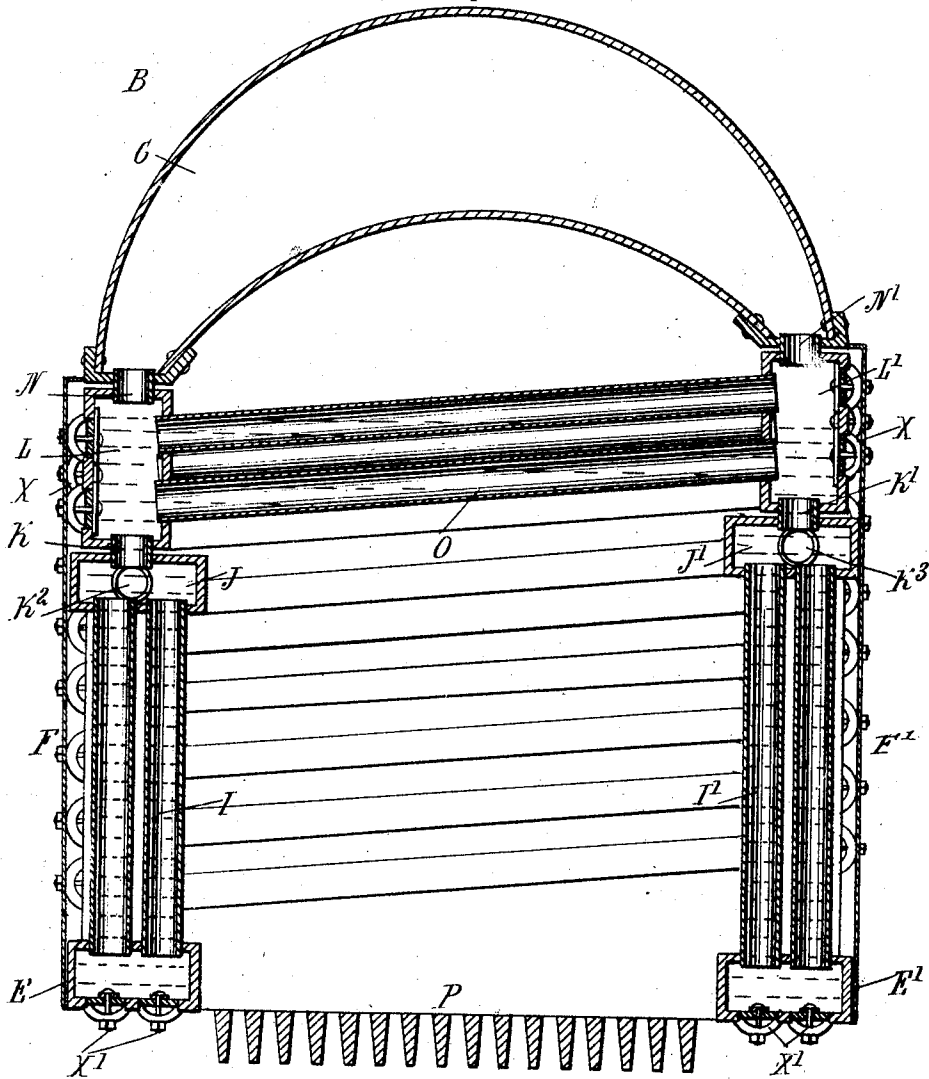
BOILER.

APPLICATION FILED FEB. 26, 1912.

1,058,665.

Patented Apr. 8, 1913.

3 SHEETS—SHEET 2.



WITNESSES

John A. Thompson
Wm. H. Hester

INVENTOR

Francisco Elizondo

BY

Munroe Co

ATTORNEYS

F. ELIZONDO.

BOILER.

APPLICATION FILED FEB. 26, 1912.

1,058,665.

Patented Apr. 8, 1913.

3 SHEETS—SHEET 3.

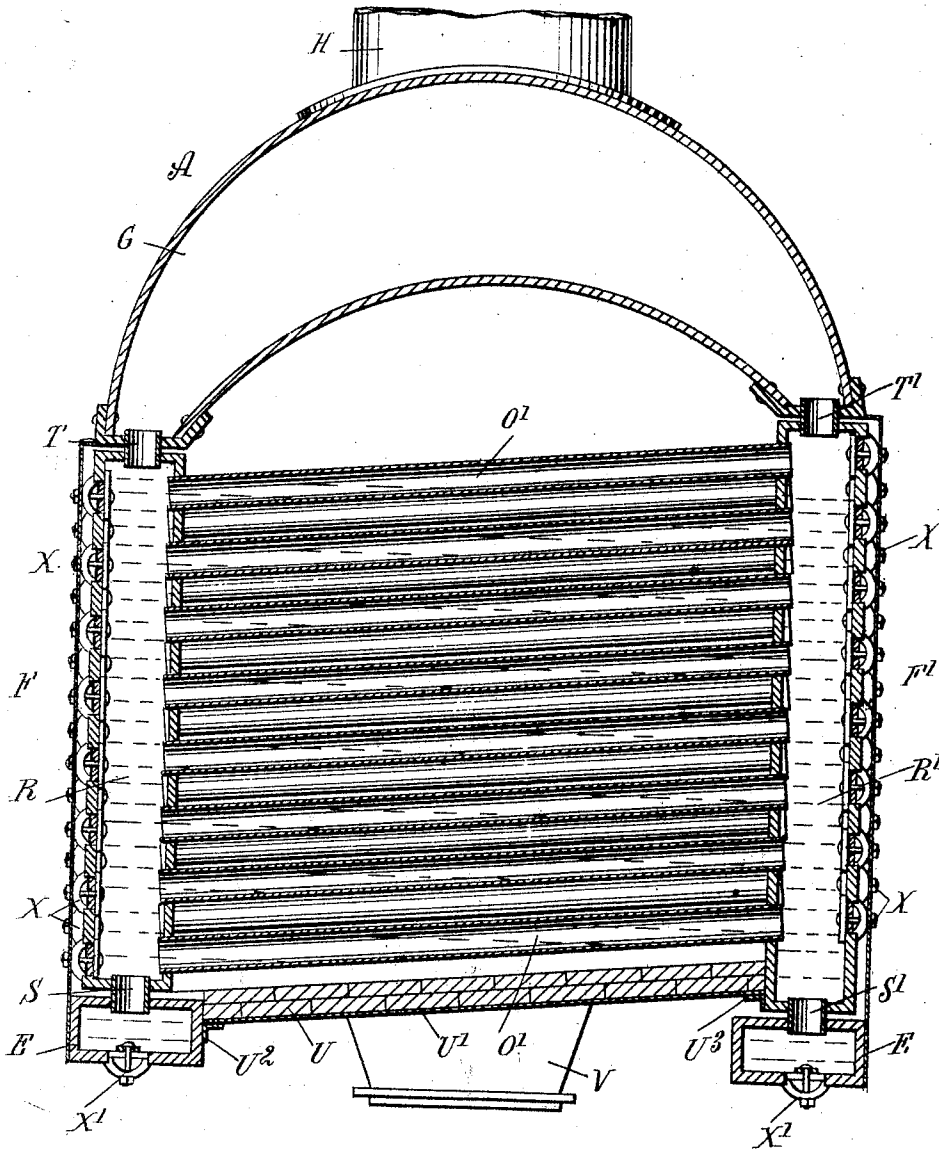


Fig. 3

WITNESSES

John A. Bergstrom
Robt. Rooster

INVENTOR

Francisco Elizondo,

BY *Munroe*

ATTORNEYS

UNITED STATES PATENT OFFICE.

FRANCISCO ELIZONDO, OF MATANZAS, CUBA.

BOILER.

1,058,665.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed February 26, 1912. Serial No. 679,825.

To all whom it may concern:

Be it known that I, FRANCISCO ELIZONDO, a citizen of Cuba, and a resident of Matanzas, Cuba, have invented a new and improved Boiler, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved boiler more especially designed for use on locomotives and arranged to provide a large heating surface, to insure a rapid circulation of the water, and quick generation of steam, to avoid exposure of rivets to the heat of the burning fuel in the fire box and thus reduce leakage to a minimum, to permit easy cleaning of the boiler, and to avoid incrustation.

For the purpose mentioned use is made of bottom water chambers extending the length of the boiler at the sides thereof, the water legs rising from the said bottom chambers, a top of crescent shape in cross section and connected at its sides with the upper ends of the said water legs, and transverse tubes connecting the water legs with each other.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views. Figure 1 is a longitudinal central section of the boiler; Fig. 2 is an enlarged cross section of the fire box section of the boiler, the section being on the line 2—2 of Fig. 1; and Fig. 3 is an enlarged cross section of the boiler on the line 3—3, of Fig. 1.

The main section A of the boiler terminates at the front end in a fire box section B and at the rear end in a smoke box C provided with the usual stack D and the bottom connection D' for engagement with the front saddle of the locomotive. The main section A and the fire box section B are mounted on bottom chambers E and E' arranged at the sides of the boiler and supporting water legs F and F' connected at their upper ends with the sides of a top or steam chamber G of crescent shape in cross section and supporting a steam dome H. The sections of the water legs F and F' at the fire box section B of the boiler are different in construction from the water leg sections of the main section A of the boiler, and the said water leg section of the fire box section B of the boiler is arranged as follows, special reference being had to Figs. 1 and 2. From the bottom chambers E and

E' rise tubes I, I', connected at their upper ends with upper chambers J and J' connected by nipples K with a series of top chambers L and L' connected by nipples N, N' with the sides of the steam chamber G. The upper chambers L and L' are connected with each other by transverse pipes O' inclined upwardly from the chambers L to the chambers L', as plainly indicated in Fig. 2, to insure a proper circulation of the water from the chambers L to the chambers L'. A grate P is arranged in the bottom of the fire box section between the bottoms of the bottom chambers E and E', and the front end of the fire box section is closed by a front Q provided with firing doors Q' for supplying the fire box with fuel.

The water leg sections of the main section A of the boiler are formed of a series of vertical chambers R and R' (see Figs. 1 and 3) connected at their lower ends by nipples S and S' with the bottom chambers E and E', and the upper ends of the said chambers R and R' are connected by nipples T and T' with the sides of the steam chamber G. Oppositely disposed chambers R and R' are connected with each other by transverse tubes O' inclined upwardly from the chambers R to the chambers R' to insure a rapid circulation of the water from the chambers R to the chambers R', it being understood that by the arrangement described a large number of transverse circulating tubes O and O' are provided to form a large heating surface for the water with a view to insure a rapid circulation of the water and a quick generation of steam.

The upper chambers J and J' of the fire box section B are connected at their rear ends with the first chambers R and R', as indicated in Figs. 1 and 2, so as to insure a circulation of water between the chambers J, J' and the first chambers R and R'.

By reference to Figs. 2 and 3 it will be noticed that the water leg F' on one side of the boiler is higher than the water leg F on the other side of the boiler, and consequently the tubes O and O' can be readily inclined in the manner described and for the purpose stated.

The main section A of the boiler is provided with a bottom U of fire brick or other suitable material, supported on transverse plates or bars U' carried by angle irons U², U³, of which the angle irons U² are

shown attached to the inner side of the bottom chamber E, while the angle irons U³ are attached to the inner sides of the chambers R'. A normally-closed cleaning out hole V is arranged in the bottom U for cleaning the main section A of the boiler of soot, whenever it is deemed necessary. A baffle W is arranged underneath the steam compartment G at the junction of the main section A and the fire box section B (see dotted lines in Fig. 1). Handholes X are provided on the chambers L and L' and R, R' opposite the ends of the tubes O and O' to permit of gaining access to the said tubes, and handholes X' are arranged on the bottoms of the bottom chambers E and E' opposite the tubes I and I' and the nipples S and S'.

The boiler shown and described is comparatively simple and durable in construction and a large heating surface is provided, and by arranging the fire box in the manner set forth, leakage is reduced to a minimum as no rivets are exposed to the high heat of the burning fuel in the fire box. By insuring a rapid circulation of the water, incrustation is reduced to a minimum.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A boiler, comprising bottom water chambers extending the length of the boiler at the sides thereof, water legs rising from the said bottom chambers, a top of crescent shape in cross section and connected at its sides with the upper ends of the said water legs, and transverse tubes connecting the water legs with each other.

2. A boiler, comprising bottom water chambers extending the length of the boiler at the sides thereof, water legs rising from the said bottom chambers and one being higher than the other, transverse tubes connecting the said water legs with each other, the tubes being inclined upwardly from the lower water leg to the higher water leg, and a top of crescent shape in cross section and connected at its sides with the upper ends of the said water legs.

3. A boiler, comprising bottom water chambers extending the length of the boiler at the sides thereof, water legs rising from the said bottom chambers and each made in two sections, of which one is the fire box section and the other the main section, the fire box section of each water leg having vertical tubes connected at their lower ends with the said bottom chamber, an upper chamber connected with the tops of the said tubes, and a series of top chambers connected with the said upper chamber, and the said main water leg section being formed of a series of vertical chambers connected at their lower ends with the said bottom chamber, a top of crescent shape in cross section

and connected at its sides with the said top chambers of the water leg section of the fire box and with the upper ends of the said main water leg sections, a series of transverse tubes connecting the said top chambers of the water leg sections of the fire box, and a series of transverse tubes connecting the main water leg sections with each other.

4. A boiler, comprising bottom water chambers extending the length of the boiler at the sides thereof, water legs rising from the said bottom chambers and each made in two sections of which one is the fire box section and the other the main section, the fire box section of each water leg having vertical tubes connected at their lower ends with the said bottom chamber, an upper chamber connected with the tops of the said tubes and a series of top chambers connected with the said upper chamber, and the said main water leg-section being formed of a series of vertical chambers connected at their lower ends with the said bottom chamber, a top of crescent shape in cross section and connected at its sides with the main top chambers of the water leg section of the fire box and with the upper ends of the said main water leg sections, a series of transverse tubes connecting the said top chambers of the water leg sections of the fire box, and a series of transverse tubes connecting the main water leg sections with each other, the water legs being higher at one side of the boiler than on the other side and the said transverse tubes being inclined upwardly from the lower water leg to the higher water leg.

5. A boiler, comprising bottom water chambers extending the length of the boiler at the sides thereof, water legs rising from the said bottom chambers and each made of two sections of which one is the fire box section and the other the main section, the fire box section of each water leg having vertical tubes connected at their lower ends with the said bottom chamber, an upper chamber connected with the tops of the said tubes, and a series of top chambers connected with the said upper chamber, and the said main water leg section being formed of a series of vertical chambers connected at their lower ends with the said bottom chamber, a top of crescent shape in cross section and connected at its sides with the said top chambers of the water leg section of the fire box and with the upper ends of the said main water leg sections, a series of transverse tubes connecting the said top chambers of the water leg sections of the fire box, a series of transverse tubes connecting the main water leg sections with each other, a grate in the bottom of the fire box section, a front on the fire box section, a bottom under the said main section, and a smoke box at the rear end of the main section.

6. In a boiler, a steam chamber at the top
of the boiler, water chambers at the bottom
of the boiler and extending the length of
the boiler at the sides thereof, water legs
5 formed of tubes rising from the water cham-
bers, water chambers at the sides of the
boiler with which the upper ends of the
tubes connect, water chambers above the
second chambers and connected with the
10 said second chambers and the steam cham-

ber, and transverse tubes connecting the
uppermost water chambers.

In testimony whereof, I have signed my
name to this specification in the presence of
two subscribing witnesses.

FRANCISCO ELIZONDO.

Witnesses:

D. M. MEDYA,
JULIO S. AT