

(No Model.)

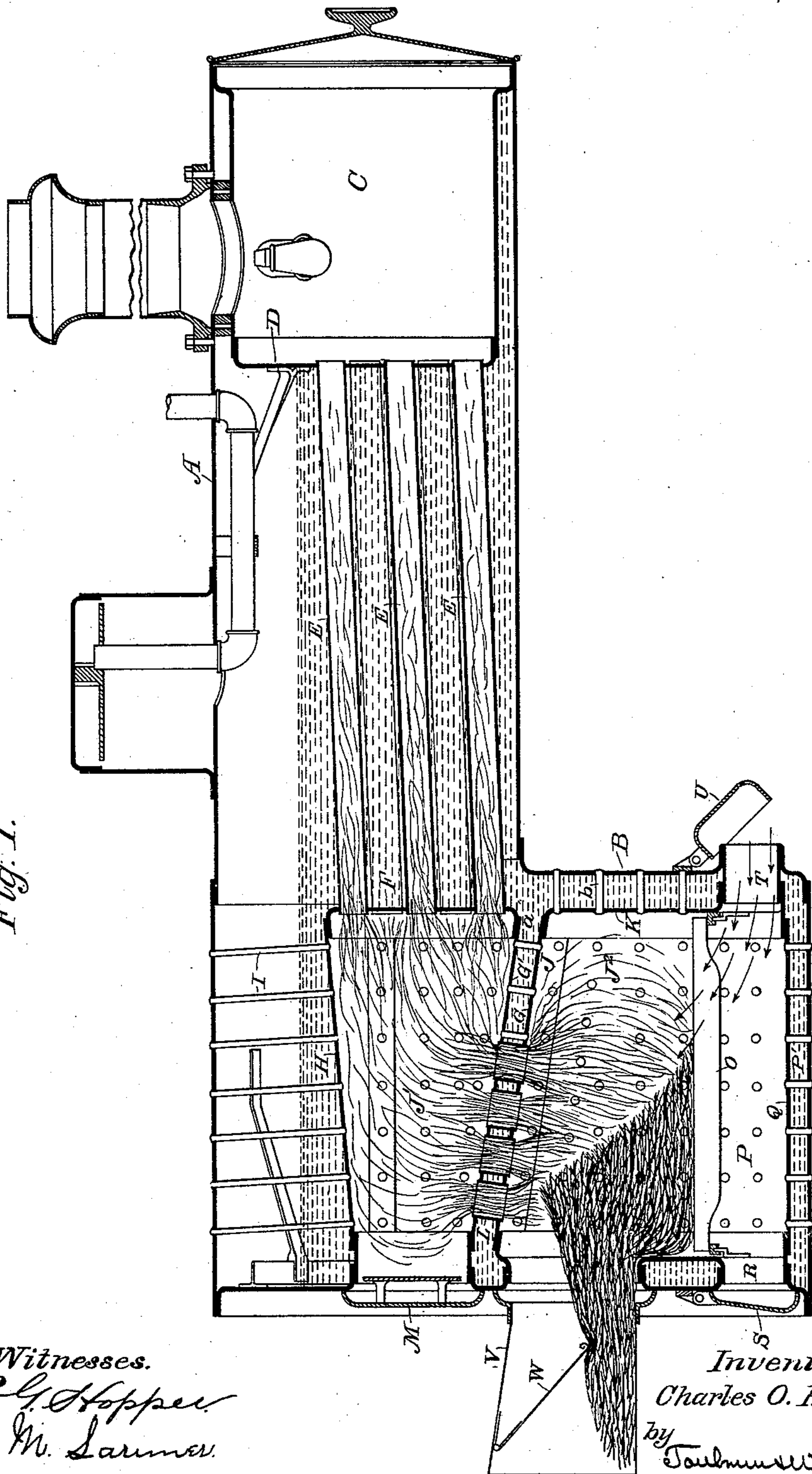
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C. O. HEGGEM.
LOCOMOTIVE BOILER.

No. 571,118.

Patented Nov. 10, 1896.

Fig. 1.



Witnesses.
L. G. Hopper.
J. M. Larmer.

Inventor,
Charles O. Heggem.
by *Tadman Whitcomb*
Att'ys.

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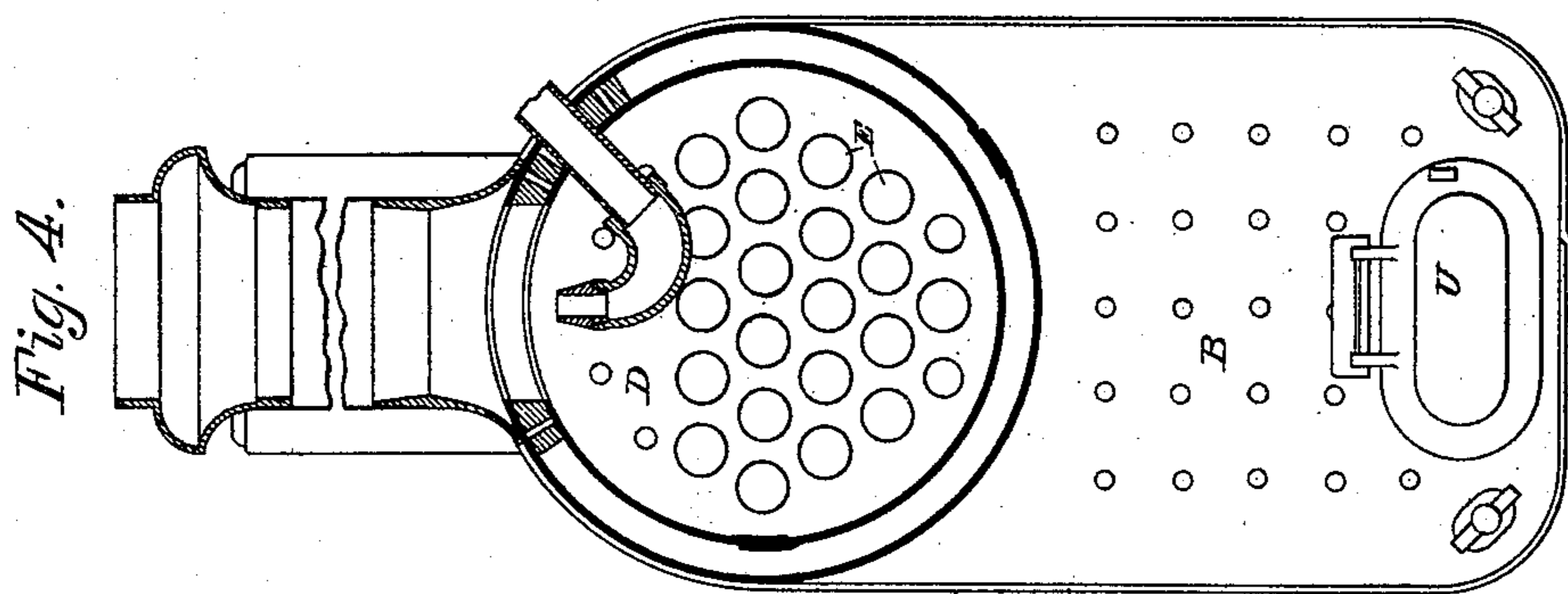


Fig. 2.

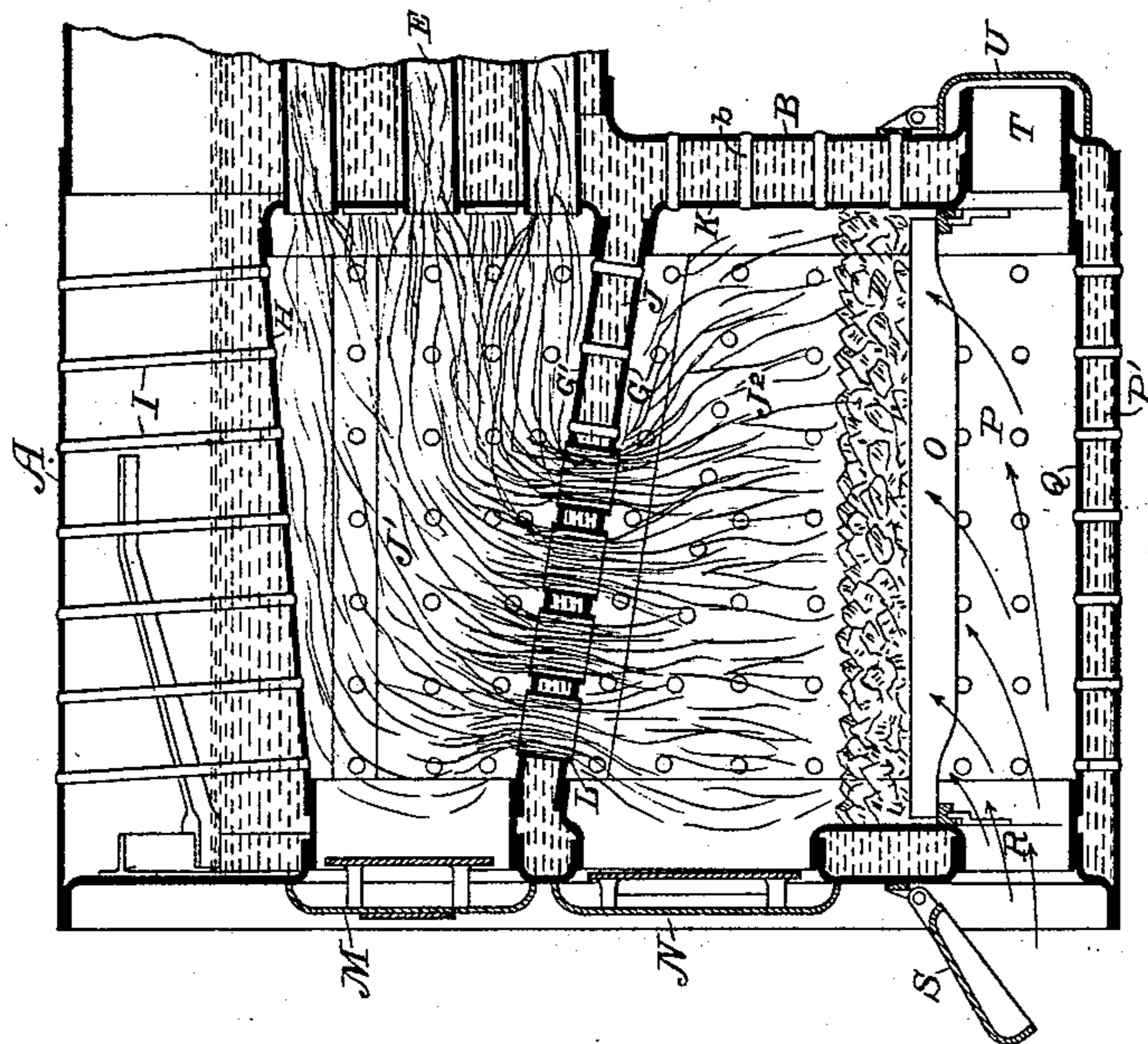
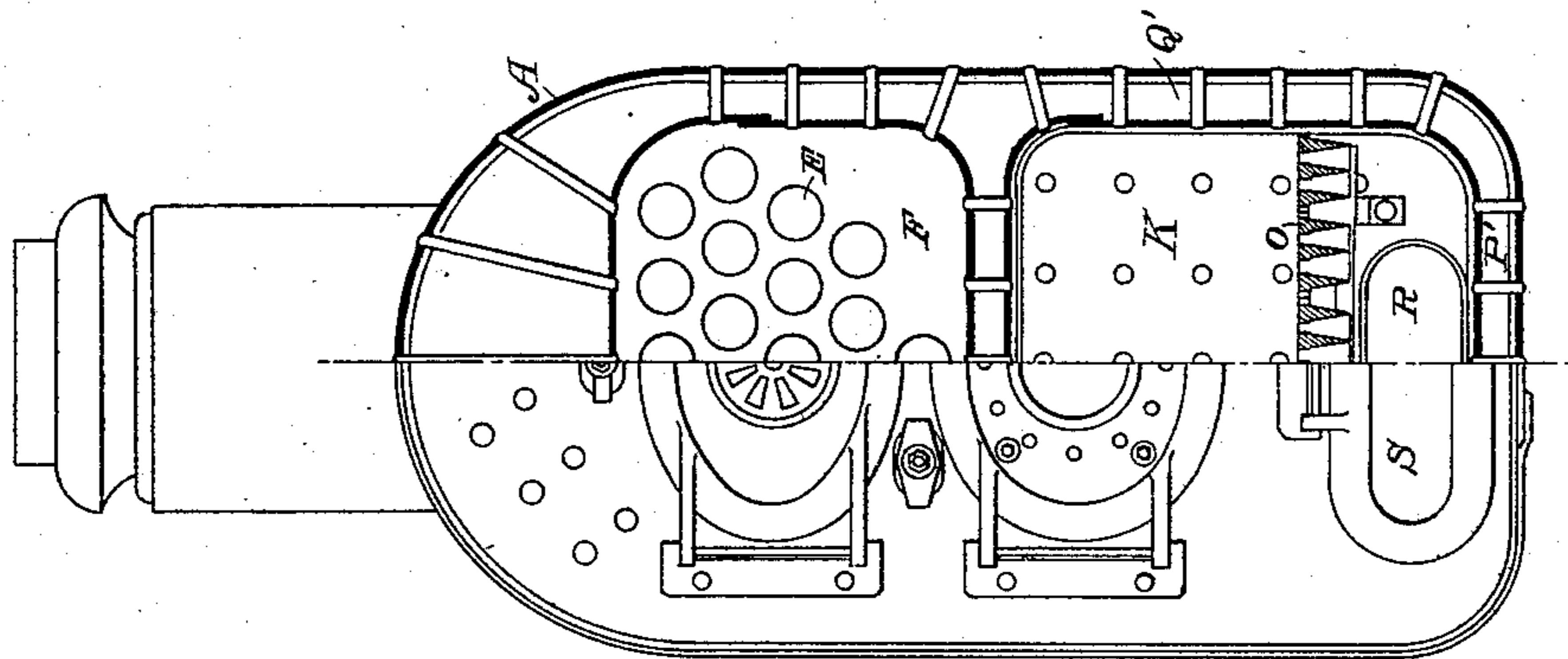


Fig. 3.



Witnesses.

L. G. Hopper.
J. W. Larmer.

Inventor,

Charles O. Heggem.

by

Thomas W. Heggem
Attys.

UNITED STATES PATENT OFFICE.

CHARLES O. HEGGEM, OF MASSILLON, OHIO, ASSIGNOR TO THE RUSSELL & COMPANY, OF SAME PLACE.

LOCOMOTIVE-BOILER.

SPECIFICATION forming part of Letters Patent No. 571,118, dated November 10, 1896.

Application filed July 9, 1896. Serial No. 598,528. (No model.)

To all whom it may concern:

Be it known that I, CHARLES O. HEGGEM, a citizen of the United States, residing at Massillon, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Locomotive-Boilers, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention has reference particularly to locomotive-boilers; and the object of the invention is the construction of a boiler that will be capable of burning alternately either straw or solid fuel, as may be desired, and
15 which shall be provided with a draft apparatus that may be made applicable in each case for the particular fuel burned, producing always a perfect combustion.

20 With this object in view the invention consists in the novel combination and arrangement of the various boiler parts, which will be more fully hereinafter described, and shown in the drawings, in which—

25 Figure 1 is a vertical central section through my improved boiler, illustrating the arrangement of dampers when using straw as a fuel. Fig. 2 is a similar section through the combustion-chamber and fire-box, illustrating the arrangement of dampers and the direction of
30 the draft when solid fuel is used. Fig. 3 is an end view of the boiler, showing a half rear elevation and a half-section through fire-box. Fig. 4 is a front elevation of the boiler, showing the construction and location of the front
35 damper and showing a section through smoke-box.

40 The letter A designates the outer casing of the boiler, extending beyond the flues and provided with a smoke-stack A' at its forward end and having a downward extension B at its rear. At the smoke-stack end the boiler is provided with an inner shell C, secured at one end to the flange B' upon the flue-sheet D, at the top to a collar C', attached to
45 the casing below the stack, and at the other to the outer casing. This shell, which constitutes the smoke-box of the boiler, is of smaller diameter than the outer casing, thus forming an annular space between the two
50 for the circulation of water and steam around the box, and is provided with an enlarge-

ment D' at its forward end where it is fitted against and secured to the inner wall of the casing. E' is a suitable door adapted to close the entire area of the forward end of said casing. It will be seen by this construction that by jacketing the box as described the same will be protected against excessive heat of the boiler, thus increasing the length of life of the smoke-box extension, preventing to a great degree the corrosion of this part of the boiler, which is ordinarily so great as to reduce its thickness to an egg-shell in the course of a very few years. At the same time an increased amount of heating-surface is provided.

At the rear of the smoke-box C are arranged the usual flues E, secured at their forward ends in the shell C and at their rear in the flue-sheet F. This latter sheet, at the top, is attached in any suitable manner to the crown-sheet H, secured to the outer shell by stay-
70 rods I, and at the bottom to a baffle-wall J, which extends across the rear of the boiler from side to side, forming the combustion-chamber J' above and the fire-box J² below the same.

The baffle-wall is composed of two metallic sheets or plates G and G', secured to each other at some distance apart by tie-bolts a. The upper sheet of the wall is secured at the front to the flue-sheet F and at the rear to the outer casing, while the lower plate is attached at its rear to the casing and at its forward end to an upright sheet K, the latter sheet being secured at some distance apart, by means of tie-bolts b, to the downward extension B of the outer casing. L are vertical tubes arranged in the baffle-wall, which form passages through the same for the heat and products of combustion from the fire. M and N, Fig. 2, are door-controlled passages leading, respectively, into the combustion and fire chambers. By this construction a water-space is formed in the baffle-wall and a water-leg is provided at the front of the fire-box, both of which are adapted to communicate with the water in the interior of the boiler.

Below the baffle-wall are located the usual grates O, and beneath the grates the ash-pit P. The ash-pit, at the front and rear, is

provided with damper-controlled draft openings or passages, and beneath the pit with a water-space P', formed between the outer casing of the boiler and the metallic sheets Q, 5 attached to the casing by the usual tie-bolts. This water-space is adapted to communicate with the water in the interior of the boiler through the usual water-legs Q', arranged upon each side of the combustion-chamber 10 and fire-box.

The draft-opening R at the rear of the boiler forms, besides a draft, a discharge passage for the ashes from the fire-box.

S is a damper hinged above and adapted 15 to control the draft-passage R. Forwardly of this passage is arranged a second draft-opening T, extending partly across the front of the downwardly-extending portion of the boiler, and is provided with a damper U, 20 similarly constructed and arranged to the damper S.

When solid fuel is to be used, the arrangement of the drafts is illustrated in Fig. 2, 25 which view shows the damper at the rear of the boiler, below the passage into the fire-box, open, while the draft-passage T in the front of the boiler is closed. This causes the draft to flow in the direction of the arrows, said draft being applied from underneath 30 the grates causing the coal to burn evenly. The purpose of the door leading to the combustion-chamber is to give accessibility to the same, and also to furnish a certain amount of air through the wicker of the door. The 35 oxygen in the air supplied through this opening being heated to the point of ignition keeps the combustion-chamber filled with a bright clear flame, and an absence of smoke is the result.

40 When straw is the fuel that is to be used, the fire-door is removed and a funnel V, as plainly shown in Fig. 1, is inserted in the feed-passage, said funnel being provided with a door W, which is hinged to the top of the 45 funnel, the free end being adapted to rest continually against the straw as it is forced into the fire-box. The damper U is now

raised, thereby opening the draft-passage T, and the draft-opening R at the rear of the boiler is closed. This causes the draft to flow 50 in a direction as shown in Fig. 1, causing the straw to burn at the ends as it is forced in through the funnel.

By constructing and arranging the drafts in the manner described all the straw will be 55 burned and a perfect combustion obtained, which heretofore has not been accomplished, as by the old method of applying the draft from underneath, in the manner illustrated in Fig. 2, when coal is the fuel used, if a con- 60 siderable quantity of straw were forced in, the fire would be put out.

Having thus described my invention, what I claim, and desire to secure by Letters Pat- 65 ent, is—

In a locomotive-boiler for alternately burning straw and solid fuel, the following instrumentalities; an outer casing, an inner shell constituting the sides and top, the front, 70 rear and bottom of the furnace, an inclined baffle-wall forming a partition in said inner shell, and having passages, a combustion-chamber above the baffle-wall with a door-opening, a fire-box proper beneath the said wall with a door-opening, grate-bars extend- 75 ing from the front to the rear wall of said inner shell, an ash-pit constituting also a draft-passage beneath the grate-bars, a door-controlled draft-passage in the front wall leading through the ash-pit to that end of the 80 grate-bars, and a door-controlled draft-passage in the rear wall leading through said ash-pit to that end of said grate-bars, whereby in burning straw air is introduced through the forward passage while the latter is closed, 85 and in burning coal the latter is opened while the former is closed.

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

CHARLES O. HEGGEM.

Witnesses:

W. K. ATWATER,
IRVINE A. YOST.