J. HALL & C. M. LANE.

Steam Boiler.

No. 232,121. Patented Sept. 14, 1880.

FIG. 1

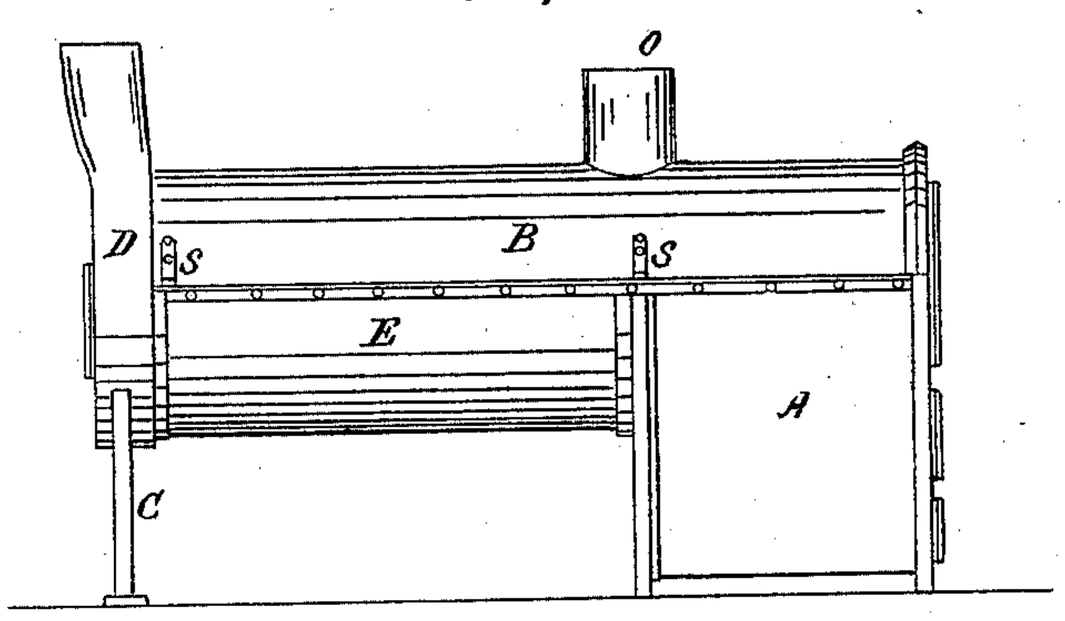


FIG. 3.

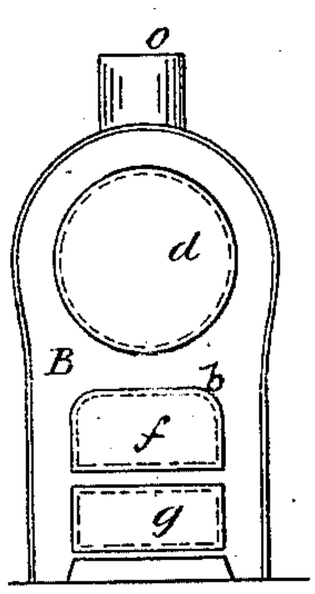


FIG. 4.

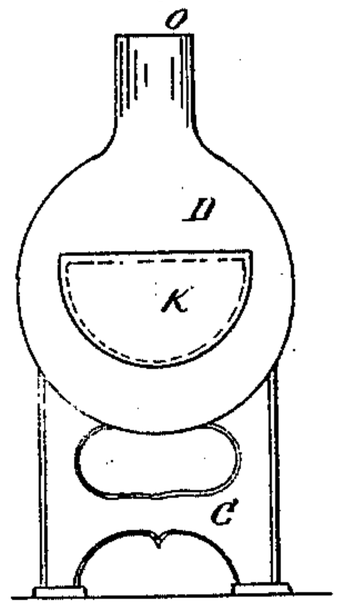


FIG. 2.

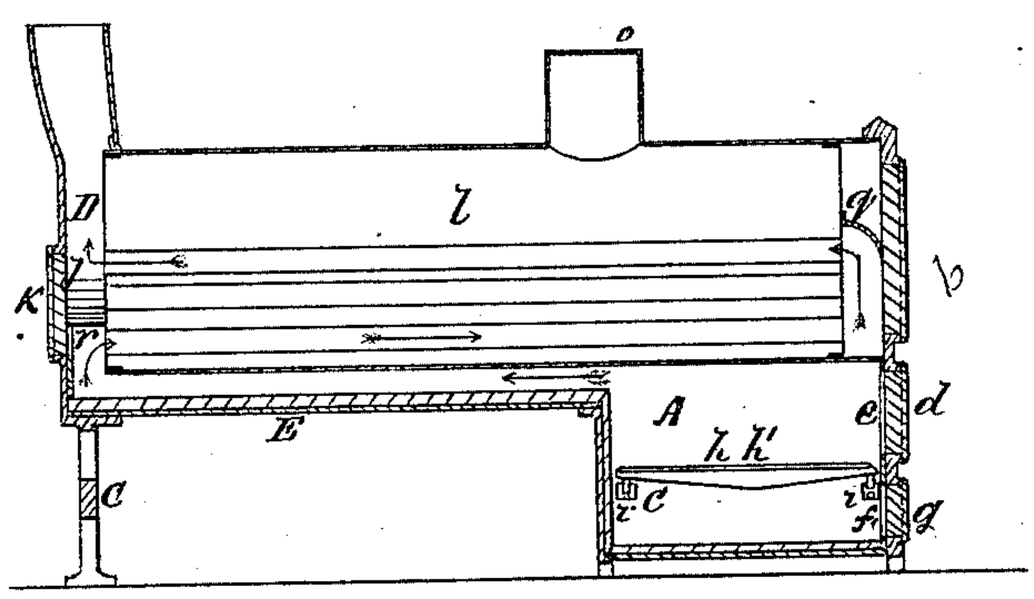


FIG. 5.

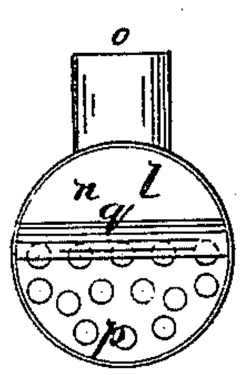
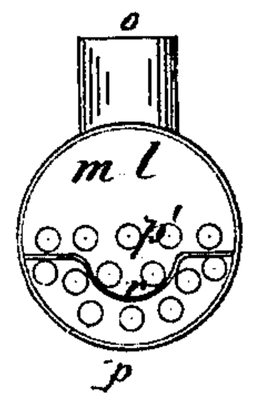


FIG. 6.



Witnesses:

F. Barrett.

W. Kirkup

Inventors:

Jonathan Hall

C. Marcellus Lane,

Per:

Richard Gerner.

Atty.

UNITED STATES PATENT OFFICE.

JONATHAN HALL AND C. MARCELLUS LANE, OF KEENE, ASSIGNORS OF ONE-THIRD OF THEIR RIGHT TO GEORGE F. LANE, OF EAST SWANZEY, N. H.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 232,121, dated September 14, 1880.

Application filed October 1, 1879.

To all whom it may concern:

Be it known that we, JONATHAN HALL and C. MARCELLUS LANE, of Keene, county of Cheshire, State of New Hampshire, have jointly invented certain new and useful Improvements in Portable Steam-Boilers; and we do hereby declare that the following is a full, clear, and exact description of our invention, enabling others skilled in the industry to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters and figures of reference marked thereon.

The object of our invention is to provide for portable steam-boilers which can be cheaply constructed and be readily taken apart and repaired, and which are very economical in the use of fuel for generating the required steam.

In order to describe our invention more fully, we refer to the drawings, in which—

Figure 1 represents a side view of our improved portable steam-boiler. Fig. 2 is a longitudinal section, Fig. 3 a front view, and Fig. 4 a back view, of the same. Fig. 5 is a front view of the boiler B, and Fig. 6 a back view of the same.

A is the fire-box, and *b* is the front, made of cast-iron, and, as may be preferred, bolted or riveted together.

In the front *b* is the door-hole *e*, covered by a door, *d*, for the purpose of giving access for cleaning the flues or tubes in the boiler B. In the front, also, are the openings with the door *f*, for feeding the grate-bars with fuel.

f' is the ash-pit-door hole, and *g* is the door for the same. *h h'* represent the grate-bars.

C is the back rest, with side connection-pieces, *i i*, by aid of which the back rest is riveted or bolted to the fire-box A.

D is a combined smoke-stack base and holder for the back end of the steam-boiler B, and is bolted or riveted to the back rest, C, as well as to the cylindrical cradle or receiver E, which is also bolted or riveted to the front and fire-box.

In the back of the smoke-stack base D is cut a hole, *j*, which is provided with a door, K, for giving access for cleansing the flues and tubes of the boiler B from the rear also.

The cradle E, as well as the fire-box A, is lined with fire-brick, clay, or cement, so that the fire from the grate *h'* may not have injurious effects on these parts.

The boiler B proper, in which the steam is generated, is constructed of the cylindrical shell *l*, back *m*, front *n*, and dome *o*.

p and *p'* are flues or tubes. *q* is a front division-plate, and *r* is a back division-plate. This plate is of such a form as to throw the fire entirely into the tubes that lie contiguous to the lower half of the periphery of the steam-chest, being extended into the chest on either side at right angles to sides of the boiler, and then curved downward, so as to make a separation between the lower and upper fire-tubes in such a way as to allow the heat and fire to enter the tubes lying immediately inside of the boiler-case.

s s are lugs riveted to the shell *l*, and resting on the top of the cradle E, to which they are bolted.

When a fire is made on the grate-bars *h h'* the heat will first be communicated to the bottom of the shell *l*, and will then ascend through the lower tubes, *p*, the back division-plate, *r*, causing the heat-waves to take this course. After passing through the lower tubes, *p*, the heat will ascend in front through the upper tubes, *p'*, the front division-plate, *q*, preventing the heat from reaching the upper part of the boiler in front. From the upper tubes, *p'*, the heat goes into the smoke-stack base D, whence it ascends into the smoke-stack.

Having thus fully described our invention, we desire to claim—

The boiler B and fire-chest A, in combination with the tubes *p* and tubes *p'*, and the division-plates *r* and *q*, the former being of such a shape as to direct the flames into the pipes lying next to the lower half of the boiler-shell, substantially as set forth.

JONATHAN HALL.
C. MARCELLUS LANE.

Witnesses:
E. F. LANE,
H. E. LANE.