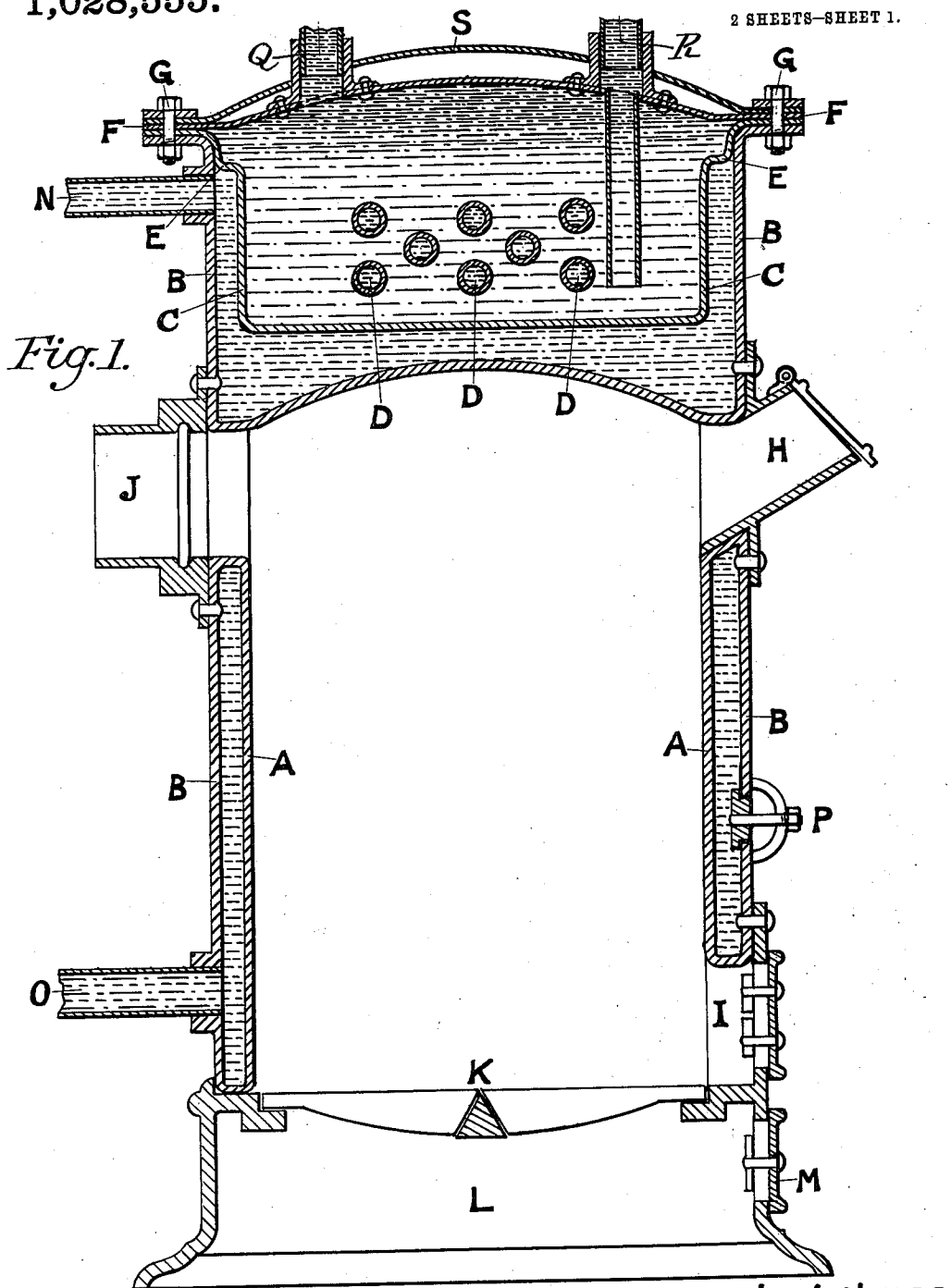


H. B. & E. S. DONALD.
COMBINATION BOILER FOR HEATING APPARATUS AND HOT WATER SUPPLY.
APPLICATION FILED JUNE 12, 1911.

1,028,555.

Patented June 4, 1912.

2 SHEETS—SHEET 1.



WITNESSES

Allan Bennett.
Guy Barker Moss.

INVENTORS

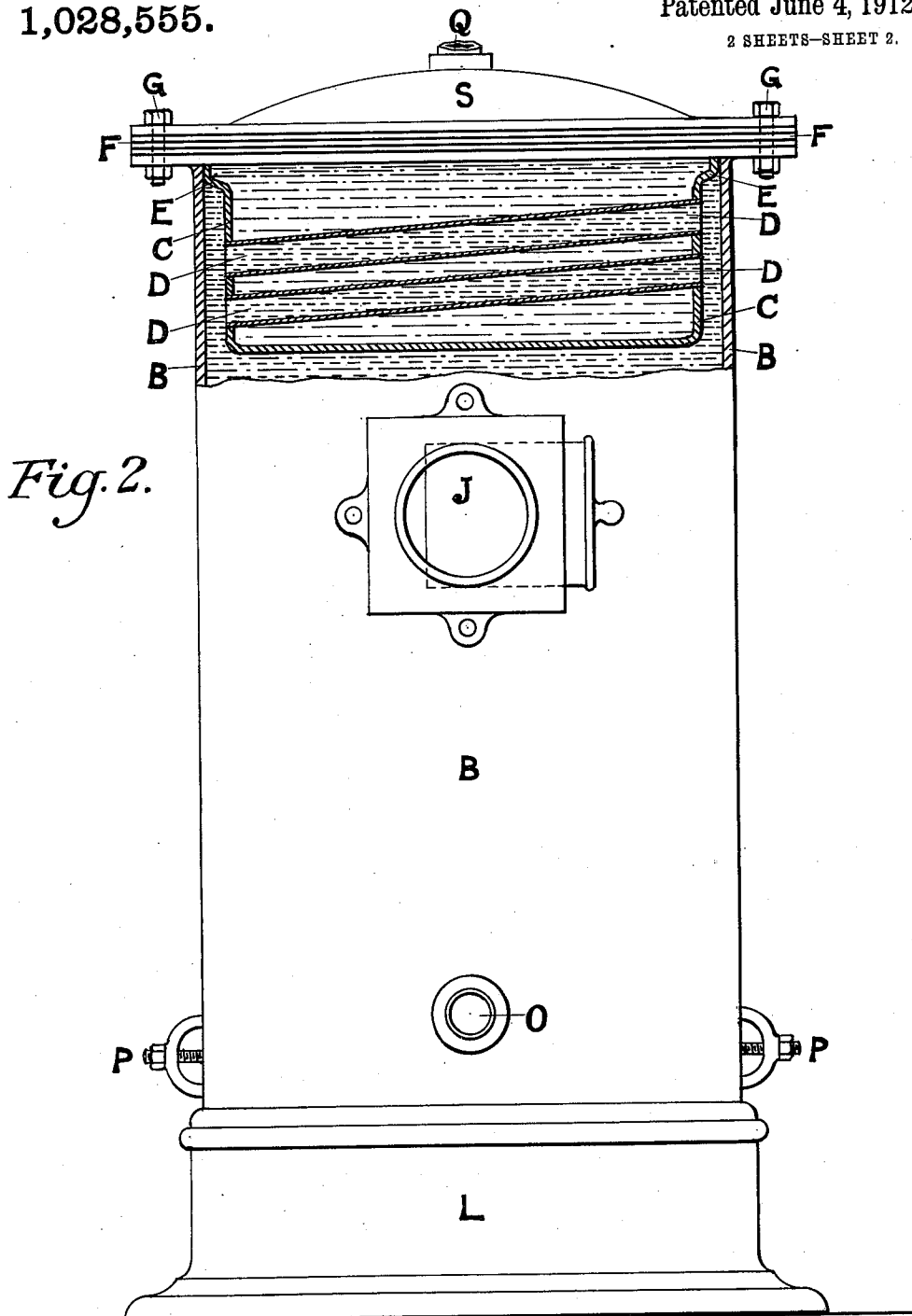
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UNITED STATES PATENT OFFICE.

HENRY BARBER DONALD AND EDWIN SPRAGG DONALD, OF LEEDS, ENGLAND.

COMBINATION-BOILER FOR HEATING APPARATUS AND HOT-WATER SUPPLY.

1,028,555.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed June 12, 1911. Serial No. 633,192.

To all whom it may concern:

Be it known that we, HENRY BARBER DONALD and EDWIN SPRAGG DONALD, subjects of the King of Great Britain and Ireland, residing at Leeds, in the county of York, England, have invented a new and useful Improvement in Combination-Boilers for Heating Apparatus and Hot-Water Supply, of which the following is a specification.

10 This invention relates to improvements in water heaters or boilers of the double-shell type in which two distinct and separate supplies of hot water (for domestic or other purposes) are generated from a single furnace arranged within the inner shell.

Figure 1 is a sectional side elevation of our improved combination boiler. Fig. 2 is a rear elevation of same, partly in section.

According to our said invention the fire-box A is fitted or formed concentrically within the lower part of an outer or primary boiler B, while an inner or secondary boiler C having a series of inclined transverse water tubes D is fitted concentrically within the upper part of the said primary boiler. The outer or primary boiler B obtains its heat from the fire in the internal fire-box A, and the water heated in the said primary boiler is used for heating buildings (by means of pipes, radiators, and the like) or for other purposes. The inner or secondary boiler C is formed with an annular shoulder E and is preferably secured by flanges F and bolts G, and obtains its heat from the hot water in the primary boiler B circulating around the secondary boiler C and through the tubes D which intersect it. The water from the secondary boiler C is intended for use mainly as a domestic hot water supply, or for other purposes where a supply of clean hot water is required and where the water from the primary boiler B would be objectionable on account of the rust and other impurities deposited therein. The outer or primary boiler B is made of iron (wrought or cast), and the inner or secondary boiler of copper or other rustless metal.

50 H is the fuel feed door, I the fire door, J the smoke outlet, K the grate bars, L the ash box, and M the ash door.

N O are the primary flow and return pipes, P P the mud doors, Q R the second-

ary flow and return pipes, and S an outer cover inclosing an air space or a non-conducting packing.

Our improved combination boiler has the advantages that, firstly, two distinct and separate supplies of hot water are generated by the one fire; secondly, wear of plant is reduced to a minimum as the life of the secondary boiler is considerably increased by reason of its not coming into contact with the fire; and thirdly, the cleaning and internal inspection of the boilers is greatly facilitated, as when the flange bolts G are released the secondary boiler C can at once be lifted out and is itself quite open for cleaning, the primary boiler B at the same time being quite open at the top for inspection or cleaning, which can be done by any practical plumber or mechanic.

We claim:

1. A combination boiler for heating purposes and hot water supply comprising an outer boiler, a heating supply apparatus in communication therewith, means for heating the outer boiler, a cover for the outer boiler at the top thereof, an inner boiler extending downwardly from said cover and adapted to be heated by the water within the outer boiler, conducting pipes for hot water circulation extending into said inner boiler.

2. A combination boiler for heating apparatus and hot water supply, characterized by an outer or primary iron boiler (for the heating apparatus circulation), a fire box fitted or formed concentrically within the lower part of said primary boiler, an inner or secondary copper boiler (for the domestic hot water supply) fitted concentrically and detachably within the upper part of said primary boiler by means of flanges, bolts, and annular shoulder, and a series of inclined transverse water tubes intersecting said secondary boiler, the hot water in said primary boiler circulating around said secondary boiler and through said intersecting water tubes, substantially as herein set forth.

HENRY BARBER DONALD.
EDWIN SPRAGG DONALD.

Witnesses:

ALLAN BENNETT,
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