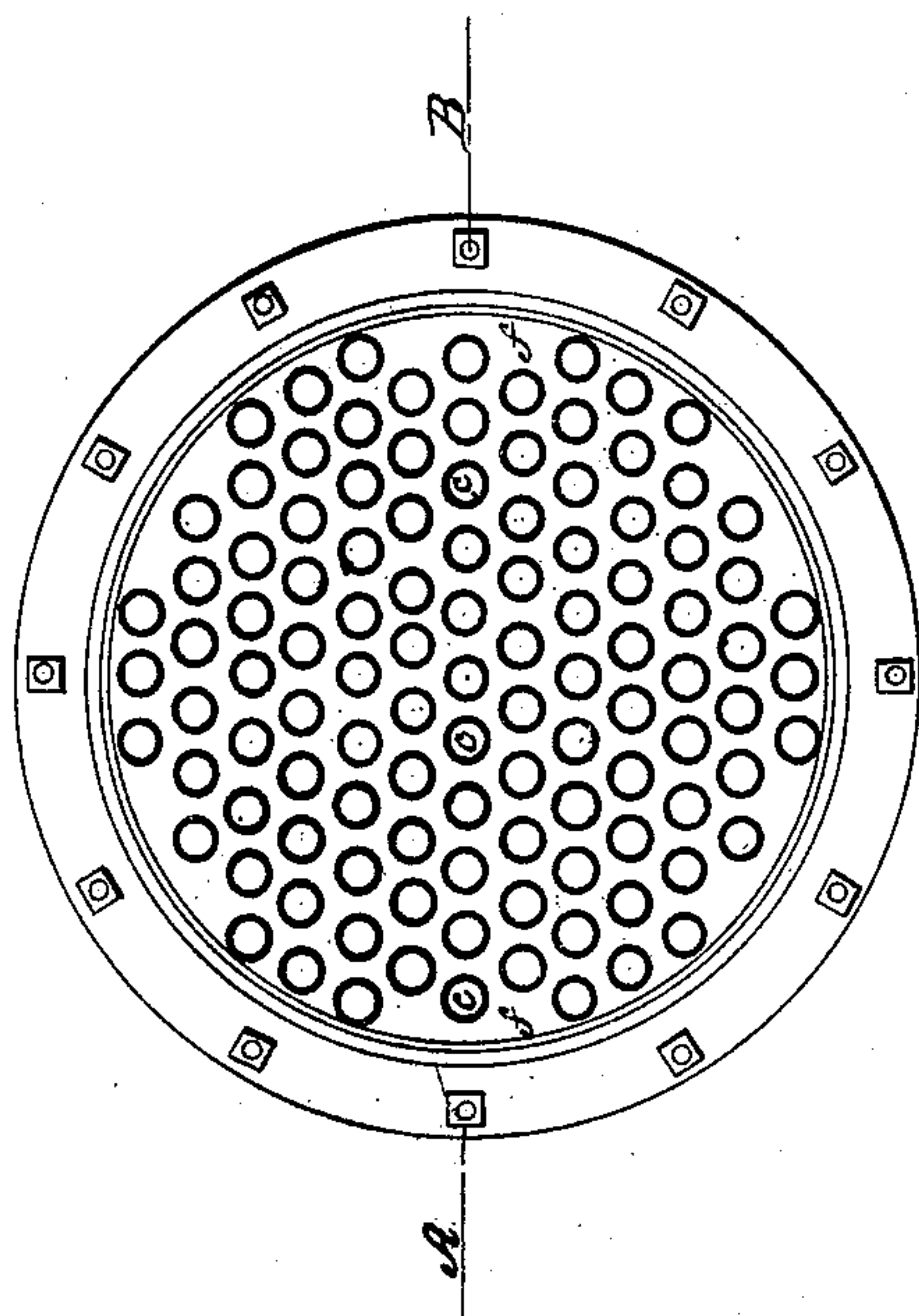
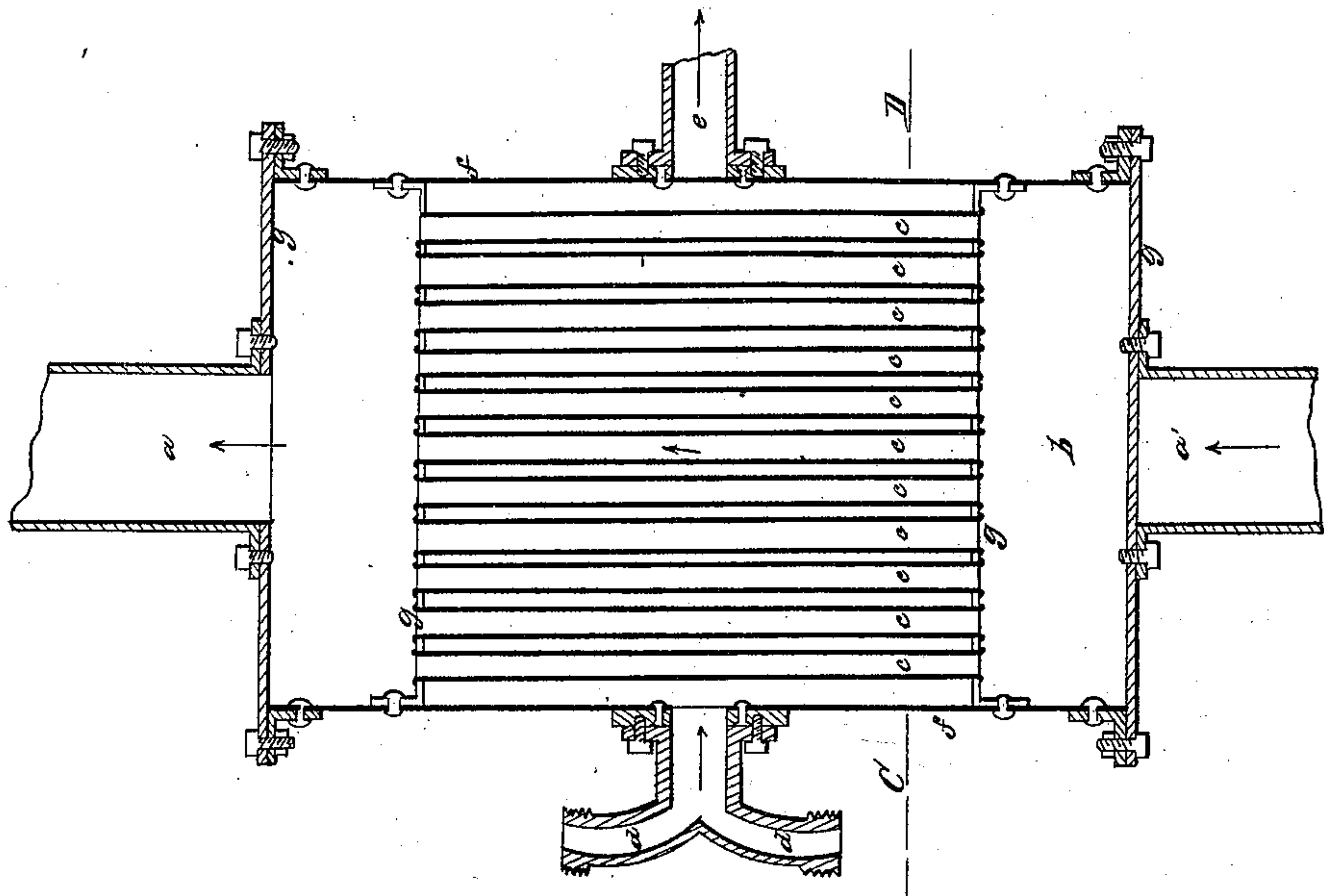


*R. Minans,*  
*Steam-Boiler Condenser.*  
*No 309.                      Patented July 29, 1837.*



# UNITED STATES PATENT OFFICE.

ROSS WINANS, OF BALTIMORE, MARYLAND.

## APPARATUS FOR HEATING WATER FOR STEAM-BOILERS.

Specification of Letters Patent No. 309, dated July 29, 1837.

*To all whom it may concern:*

Be it known that I, ROSS WINANS, civil engineer, of the city of Baltimore, in the State of Maryland, have invented an Improvement in the Mode of Heating Water which is Forced into Boilers of Steam-Engines by Means of Force-Pumps; and I do hereby declare that the following is a full and exact description thereof.

10 The apparatus which I employ is intended to expose the water to the heating influence of the waste steam from locomotive, or other steam engines, as the said water is on its passage between the force pump and the boiler. 15 This apparatus may be differently formed, but for the purpose of illustration I will describe it in the shape in which I have essayed it, and which I have found to answer the intention perfectly well.

20 I make a cylinder of metal, *f, f*, which may be twenty-four inches long, and fifteen inches in diameter, for an ordinary locomotive engine; this cylinder has at each end two metallic heads, *g, g*, which may be four 25 inches, more or less, apart; the interior heads are perforated with numerous holes into which are inserted small tubes *c, c*, say of three eighths of an inch in diameter, which tubes are firmly attached, or fastened, into, 30 the openings in the heads, thus establishing a number of passages through from one of the spaces *b, b*, between the heads at one end of the cylinder, to the space at the opposite end. The waste steam pipe, *a'*, from the engine enters the head at one end of the cylinder, and a similar pipe, *a*, passes out from the opposite end, and in its passage from one to the other the steam must necessarily 35 pass through the small tubes above named, which are contained in what may be denominated an enlargement of the waste steam pipe. In the side of the cylinder, I make

two perforations, *d, d, e*, opposite to each other, into which openings the supply pipe, between the pump and the boiler is firmly 45 inserted, thereby causing the cold water as it passes from one segment of this supply pipe to the other, to become heated by its contact with the tubes through which the waste steam passes. The upper part of the 50 supply pipe, between the system of heating tubes and the boiler, is furnished with a puppet, or other, valve, opening toward the boiler.

Although I have described the steam as 55 passing through the system of small tubes, and the water as surrounding them, it will be manifest to any one having the slightest acquaintance with the subject that this order may be reversed, and the same effect upon 60 the water be still produced; and also that, instead of the tubes, a system of partitions to be alternately occupied by steam and by water, will be substantially the same with the arrangement before described. In those 65 locomotive, or other, engines in which the waste steam is employed to drive a blowing apparatus, as is the case with those used on the Baltimore and Ohio Railroad, and some others, the waste steam is allowed to per- 70 form this office before it reaches the heating apparatus; the means of doing which will not require any description, as it will be perfectly manifest to every competent engineer.

What I claim as my invention, and wish 75 to secure by Letters Patent, is—

The heating of the water in its passage from the supply pump to the boiler, by means of an apparatus substantially the same with that herein described.

ROSS WINANS.

Witnesses:

THOS. P. JONES,  
CLEMENT T. FOOTE.