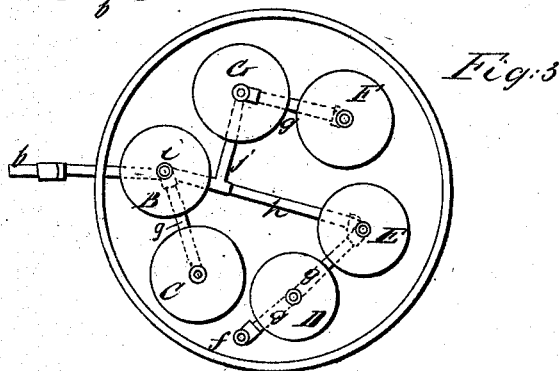
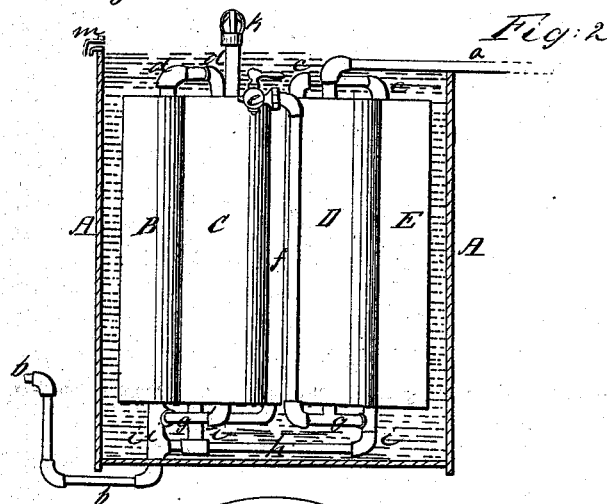
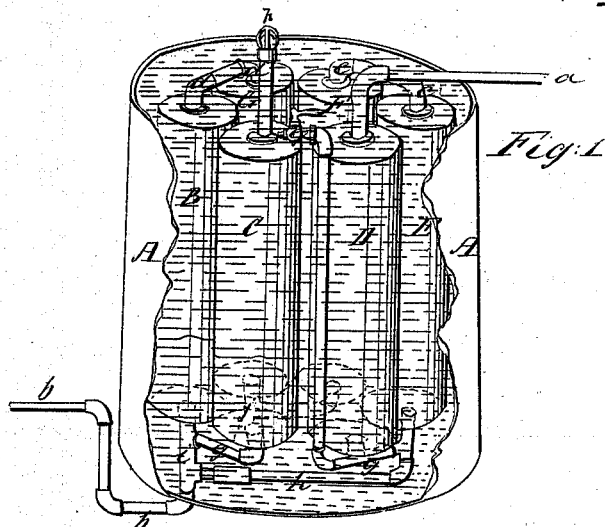


H. Anderson,
Steam Boiler Condenser.

N^o 107,748.

Patented Sep. 27. 1870.



Witnesses,
W. R. Ryan
Bernard Bailey

Inventor
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United States Patent Office.

HARRISON ANDERSON, OF PEORIA COUNTY, ILLINOIS.

Letters Patent No. 107,748, dated September 27, 1870.

IMPROVEMENT IN STEAM-ENGINE CONDENSERS.

The Schedule referred to in these Letters Patent and making part of the same.

Be it known that I, HARRISON ANDERSON, of the county of Peoria and State of Illinois, have invented a new and useful Apparatus for Condensing Steam for Steam-Generators; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, in which—

Figure 1 is a perspective view.

Figure 2, a vertical section.

Figure 3, a plan.

In these diagrams like letters refer to like parts.

I construct my condenser of two or more vertical cylinders of sheet-iron, closed at the top and bottom with the same material, B C D E F G.

These cylinders are connected in pairs at their upper surfaces by the pipe *c c*, *d d*, &c.

Similar pipes, *g g g*, &c., make a like connection between each series of pairs at the bottom of each cylinder, in such a manner that the steam to be condensed makes the circuit of the whole set of cylinders by entering the induction-pipe *a* from the exhaust-pipe and passing down into the first cylinder, D, then out at the base of the same through the pipe *g*, connecting it with the adjoining cylinder, E, into the latter, and up through the same, thence out at the pipe *c c*, and so on continuously through the series.

Beneath one cylinder of each pair of cylinders B E G is an extension, vertically, *i i i*, of the connecting-pipes *g g g*, &c., which lead into the pipe *h*, for carrying off the condensed steam to the eduction-pipe, *b*.

The latter pipe, *b*, is placed a little below the level of the pipes *g g g*, for conducting the condensed steam, in order that the former pipe, *b*, may receive the condensed steam by a natural fall, and also that the water may not interfere with the passage of the steam through the connecting-pipes from cylinder to cylinder.

The whole apparatus, now described, is set in a convenient tank, A, and so arranged that every side of each cylinder is well submerged in cold water.

The perpendicular pipe *f*, communicating at the base of the cylinder D with the connecting-pipe *g*, is fitted with a valve, *e*, a little above the surface of the cylinders, where the water (by the action of the steam in the cylinders) will be the warmest, carries off this warm water, when required, for the purpose of supplying any deficiency of condensed steam to the pumps.

The operation of this apparatus is as follows:

The steam, entering by the induction-pipe *a*, passes down through the cylinder D, through the connecting-pipe *g*; thence up into the cylinder E, into the pipe *c c*; thence down into the next cylinder, F, into the connecting-pipe *g*, thus still passing onward, alternately, up and down, until the last cylinder, G, of the apparatus is reached, where such superfluous steam as may remain finds a vent through the valve *k*, at the outlet of the cylinder, above the water.

The condensed steam formed during this transit, running down the sides of the cylinders, passes out of the same by the same outlet whence the steam passes to the adjoining cylinder, by and through the pipes *i i i*, one being attached to one cylinder of each pair of cylinders.

These pipes *i i i* are connected with and run into the main conducting-pipe *h*, which conveys the condensed steam to the eduction-pipe *b*.

The advantages of this apparatus consist in—

First, the efficiency, as there is no part of the cylinders which does not give a condensing surface.

Second, its cheapness and readiness of construction.

Third, the ease with which it may be cleansed.

Fourth, the non-liability to derangement.

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

The combination of a series of pairs of condensing-cylinders, B, C, D, E, F, and G, constructed and arranged substantially as described.

HARRISON ANDERSON.

Witnesses:

WM. BRYAN,

BERNARD BAILY.