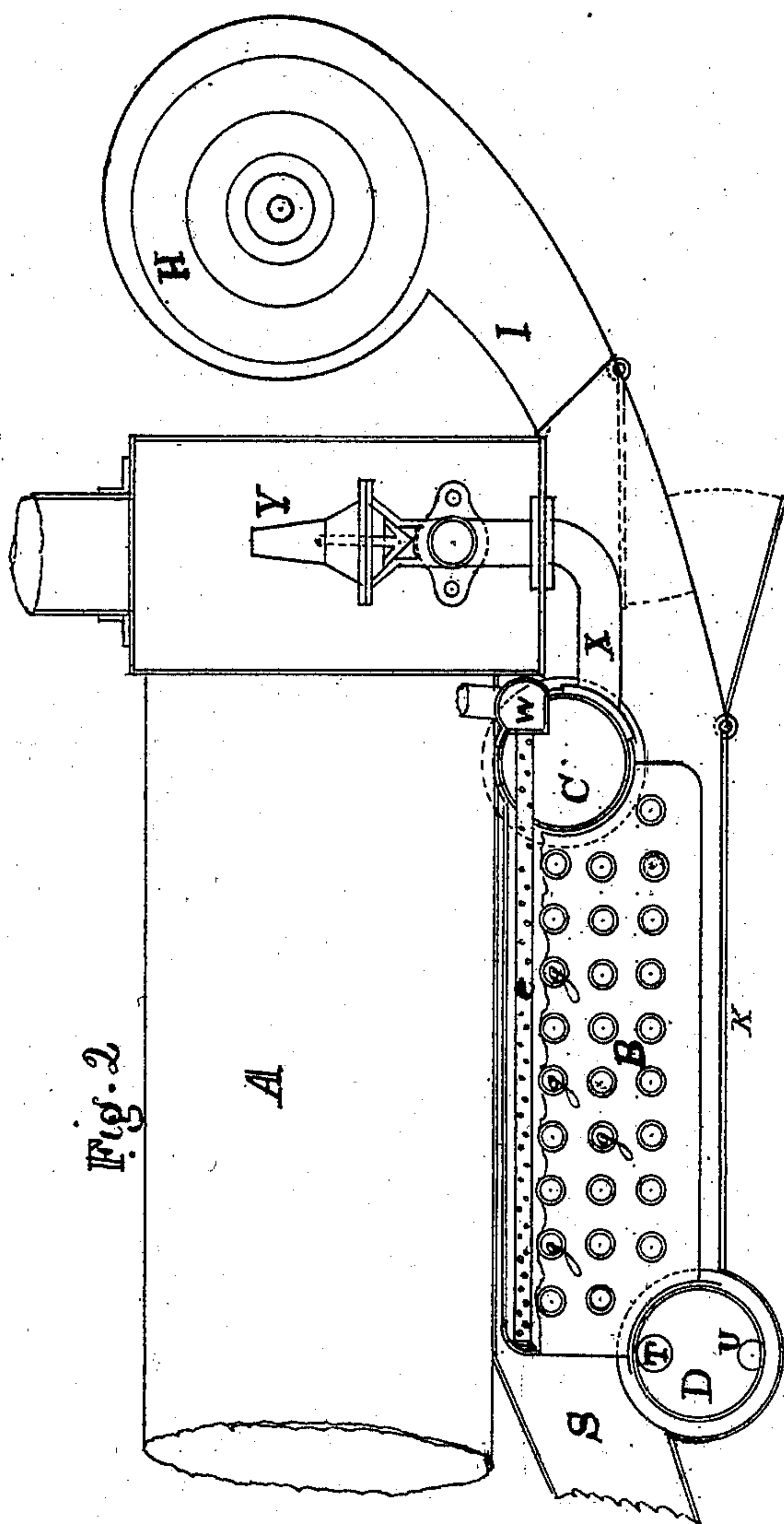
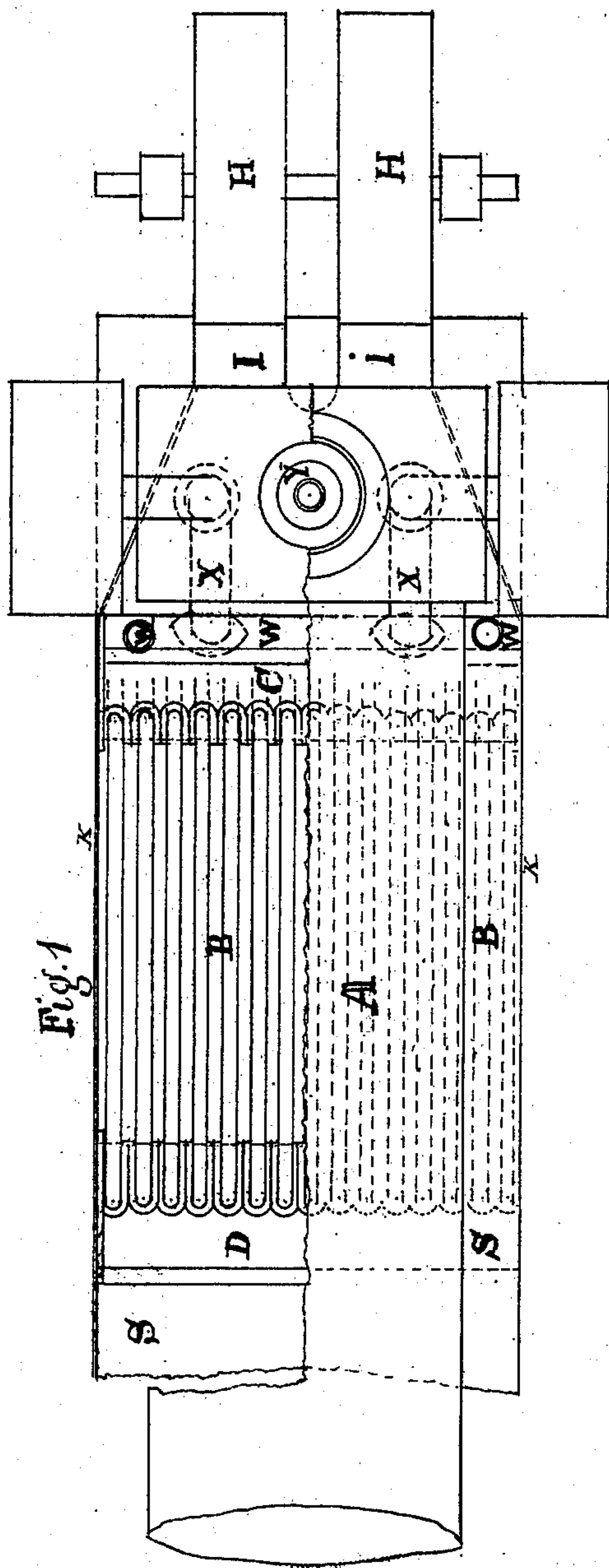


D. MATTHEW.
STEAM CONDENSER.

No. 15,663.

Patented Sept. 2, 1856.



Witnesses
Charles D. Freeman
Reverese Kelly.

David Matthew

UNITED STATES PATENT OFFICE.

DAVID MATTHEW, OF PHILADELPHIA, PENNSYLVANIA.

CONDENSER FOR STEAM-ENGINES.

Specification of Letters Patent No. 15,663, dated September 2, 1856.

To all whom it may concern:

Be it known that I, DAVID MATTHEW, of the city of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Steam or Vapor Condensers; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawings, making part hereof.

10 The nature of my invention consists in combining within the condenser between a series of condensing plates or surfaces the united condensing action of both jets of water and of currents of atmospheric air in
15 the manner substantially as presently described.

The construction of my improvement is as follows, reference being had to the annexed drawings in which—

20 Figure 1, is a top view of the steam boiler and condenser, with part of the boiler and condenser removed to show a portion of the interior of the condenser. Fig. 2 is a side view of the boiler, and condenser in
25 section with its upper part in broken view to show the rose pipe, and in both figures like letters refer to like parts.

"A" is the steam boiler and its smoke box of any usual form.

30 "B," is the condenser consisting of a series of vertical flat tubes connected in front to and extending below the steam receiving cylinder "C" and at their back ends connected to the condensed steam or water
35 receiving cylinder "D." These flat tubes are at right angles to the axis or centers of these two cylinders, and incline toward "D" to let the water run into it. These flat tubes also are connected together by numerous
40 short horizontal cylindrical tubes "g" extending between them, and answering also as stays to prevent collapse, as well as giving additional condensing surface. Inside of the upper part of each of these flat tubes
45 is extended a perforated water or jet pipe "e" running the whole length of the flue, and all of these jet pipes connect in front to a cross supply pipe "W" into which is

discharged the supply of injection water for these rose pipes. These tubes and cylinders 50 are surrounded by an outside casing "K" and by means of the blower H and its nozzle i or by velocity and a funnel shaped mouth in front of the engine or on the boat atmospheric air in a cool state is forced in 55 and through the spaces between the flat flues and cross tubes or stays of the condenser and thus condenses the steam or aids the water in condensing the steam, and becoming heated passes back to assist the furnace, 60 through pipe "S." The injection water used in cross pipe "W" and in the rose pipes "e" comes in contact with the steam which passes from the engine's cylinders through the pipes X into the receiver "C" 65 and condenser "B" where it is condensed and runs into the bottom of the receiver "D" from which it is extracted through pipe "U." Vapor of bi-sulfuret of carbon may be condensed by this condenser, in 70 which case the water will be extracted through pipe "T" and the bi-sulfuret through pipe U. The water from the receiver "D" may be forced by means of a double acting force pump through a series 75 of cooling pipes so that it returns to the jet pipes cool and under pressure for repeated use.

"Y" is an exhaust pipe with a floating valve held down by the pressure of the atmosphere and only operating to exhaust up 80 the chimney in case the condenser fails to condense from any accidental cause, or is shut off and the engine used as high pressure. 85

What I claim is—

The combination of the flat vertical tubes connected by horizontal tubes with rose pipes inside and surrounded by the outer case to condense by the combined action of 90 air and water, substantially as described.

DAVID MATTHEW.

Witnesses:

CHARLES D. FREEMAN,
PENROSE FELT.