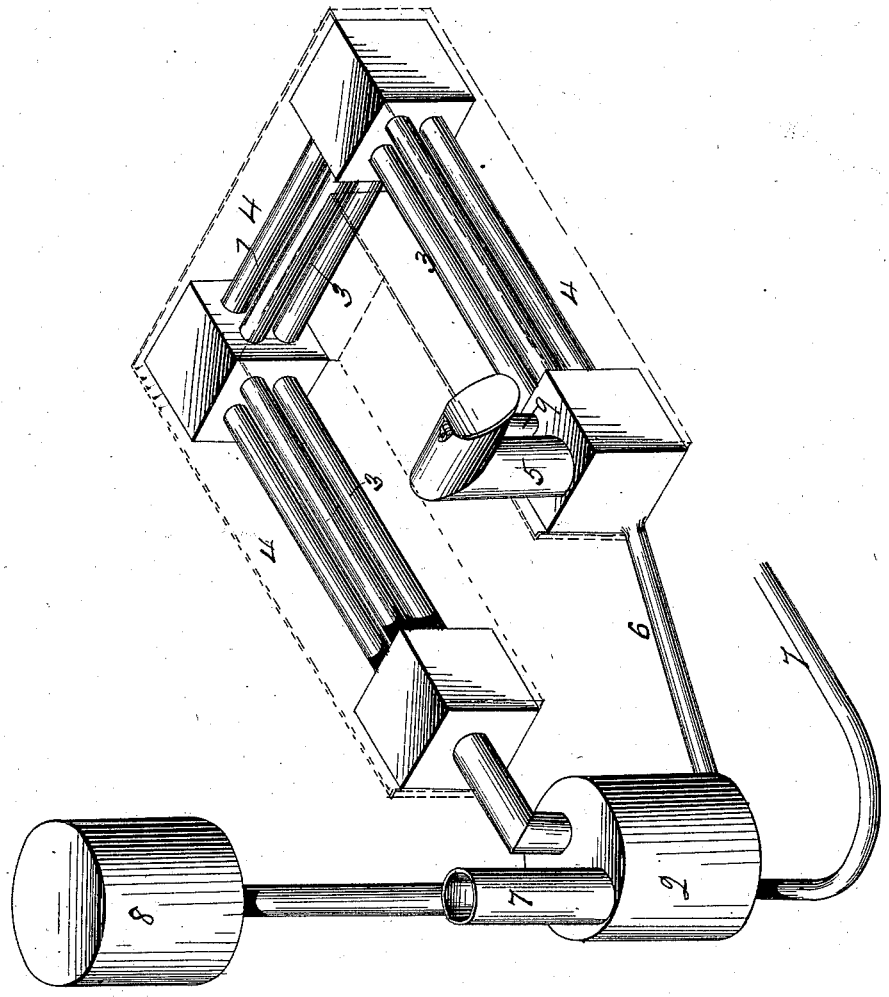
E. Baldrin,

Steam-Boiler Condenser.

No. 7,486. Patented July 9, 1850.



UNITED STATES PATENT OFFICE.

ETHAN BALDWIN, OF PHILADELPHIA, PENNSYLVANIA.

CONDENSER OF STEAM-ENGINES.

Specification of Letters Patent No. 7,486, dated July 9, 1850.

To all whom it may concern:

Be it known that I, ETHAN BALDWIN, of the city and county of Philadelphia, in the State of Pennsylvania, have invented an Improved and useful Condenser, and I do hereby declare 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 the exhaust pipe from the engine, Fig. 2 the hot water receiver and heater. Fig. 3 the condenser, Fig. 4 the cold water trunk, Fig. 5 the air pipe and valve, Fig. 6 the pipe leading from the condenser to the hot water receiver, Fig. 7 the feed pipe leading from the hot water receiver to the pump, Fig. 8 the cold water cistern, Fig. 9, pipe from gage valve to the last box in the range of pipes.

This condenser consists of an air tight iron cylinder called the hot water receiver and heater, the capacity of which should be about one tenth of the boiler: This stands perpendicular near the side of the engine and in its top is inserted the exhaust pipe of the engine. In the top of this receiver and heater is also inserted another pipe leading to a hollow box into the opposite side of which is inserted a number of pipes according to the size of the boiler, which range of pipes extend about one hundred feet, but never less, and in any direction to suit the boat, building or locality wherever used, and terminating in a similar box to the one already mentioned; into the bottom of the last mentioned box is inserted a pipe leading to the hot water receiver, into the bottom of which receiver is inserted another pipe leading to the force pump of the boiler. Into the top of the last mentioned box at the termination of the range of pipes is inserted a perpendicular tube corresponding in size with the exhaust pipe, the top of which is closed by an air valve in nearly a vertical position, the suspended valve of which will be opened by the slightest pressure of the air from within, but if left in equilibrio, will merely close by its own gravity, the small pipe from the gage valve in the boiler also terminates in this box. In the top of the hot water receiver will be inserted a small pipe coming from a cold water or alcohol cistern, and by means of a cock in this pipe any deficiency of fluid in the boiler, ascertained by the glass gage may be readily supplied. This range of pipes from the first to the last box is surrounded by either a pipe or trunk which is water tight; a hole is perforated through the bottom of the vessel (when used in a steam boat) into which a pipe is inserted, the other end being inserted into the water pipe or trunk at its commencement. This communicating pipe is of sufficient capacity to supply any quantity of cold water to produce perfect condensation of the steam used in the engine whatever be its density or quantity. In this pipe is inserted a valve or cock by which the required quantity of water necessary to produce perfect condensation of the steam used under all circumstances, may be required. This range of condensing pipes with its trunk is placed in nearly a horizontal position below the water line outside the boat, so that when the valve or cock is opened, the water trunk from its commencement will be immediately filled with cold water and extend to its other extremity, where it will be pumped out by a lifting pump running with the engine, whose capacity will be such under any circumstances as to raise the heated water above the level of the water outside the boat, and discharge it into a pipe passing down through, or out at the side of the boat. In all stationary engines the cold water will be supplied in such manner as to produce the same effect.

As the engine commences running, the exhaust steam from the engine passes through the exhaust pipe into the hot water receiver and heater, and rises through the pipe inserted into the top of the receiver, and is thence conducted into the hollow box and passes through the range of condensing pipes to the hollow box at the termination of the range, and in this passage being reconverted into water, it is, by means of the pipe leading from the last mentioned box, conducted to the hot water receiver and heater, whereby the action of the steam from the exhaust pipe constantly flowing into the receiver, the water is heated to nearly a boiling point, and being conducted by the pipe leading from the receiver to the force pump, it is forced back into the boiler, thus keeping the boiler constantly supplied by water at nearly or quite a boiling heat.

The advantages of this condenser over Mr. Hall's or any of its predecessors are that by means of the hot water receiver into

which the steam from the engine is conveyed by the exhaust pipe, I am enabled to heat the water from the condensed steam before it is conducted to the boiler, to nearly or quite a boiling point, this hot water receiver not coming in contact with the cold water.

What I claim and desire to secure by Letters Patent is—

Combining with a tubular condenser the receiving and heating reservoir which is connected at or near its top with the exhaust passage and with one end of the series of condensing tubes, and at or near its bottom with the other end of the series of tubes and with the exhausting and feeding pump, the whole constructed substantially in the manner and serving the purposes herein specified.

ETHAN BALDWIN.

Witnesses:
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