

S. A. GOODWIN.

Condensers for Steam-Engines.

No. 135,906.

Patented Feb. 18, 1873.

Fig. 1.

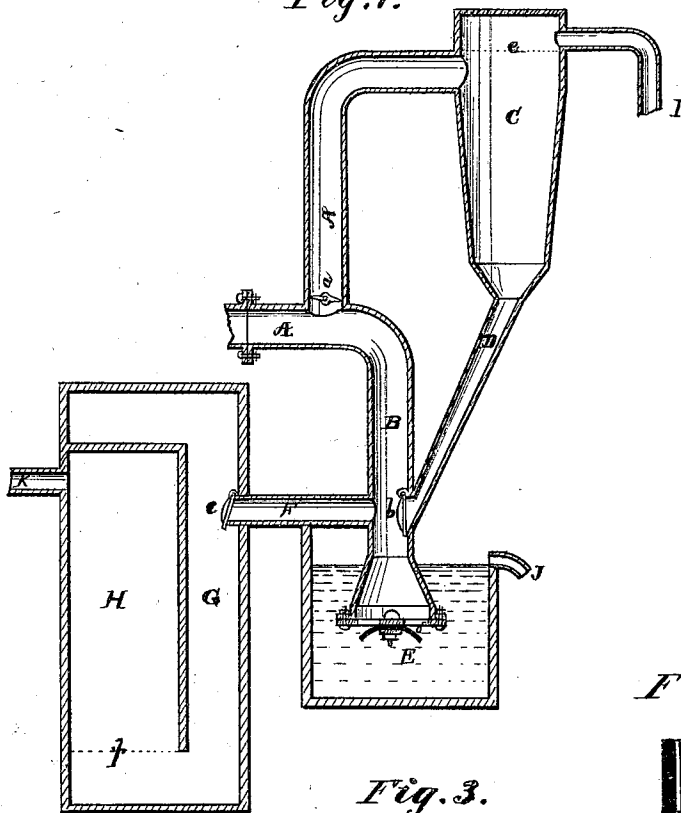


Fig. 2.

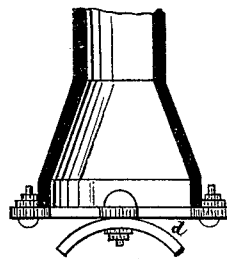
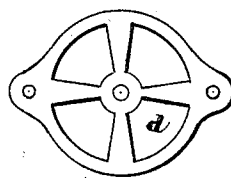


Fig. 3.



Witnesses.

A. Foxwell
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Inventor.

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UNITED STATES PATENT OFFICE.

SIMEON A. GOODWIN, OF BUFFALO, NEW YORK, ASSIGNOR TO WILLIAM D. TABER, OF SAME PLACE.

IMPROVEMENT IN CONDENSERS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 135,906, dated February 18, 1873.

To all whom it may concern:

Be it known that I, SIMEON A. GOODWIN, of Buffalo, Erie county, New York, have invented certain Improvements in Steam-Engines, of which the following is a specification:

The first part of my invention relates to a new kind of condenser for steam-engines, and the second part to a feed-water heater in combination therewith.

Figure 1 is a sectional elevation. Figs. 2 and 3 represent the foot-valve on an enlarged scale.

A A is the exhaust-pipe; B, the blow-through pipe; C, the condensing-chamber; D, a pipe connecting the condensing-chamber with the blow-through pipe; E, hot-well; F, a pipe connecting the blow-through pipe with the feed-water heater; G, feed-water heater; H, filtering-chamber within the heater; I, injection-pipe; J, overflow-pipe; K, feed-water pipe to boiler; *a*, valve operated by the engine to close the passage to the condenser when blowing through; *b*, clack-valve to prevent the steam from passing into the condensing-chamber up the pipe D while blowing through; *c*, a valve to trap the steam and water that is blown into the heater during the process of blowing through; *d*, foot-valve in blow-through pipe opening downward; *e*, strum or perforated diaphragm upon the top of the condensing-chamber; *f*, perforated bottom to the filtering-chamber. The foot-valve *d* is a grated rubber valve, as shown in detail on larger scale in Figs. 2 and 3.

Operation.

For the greater part of the stroke of the engine the valve *a* is open and the exhaust steam passes freely into C, when it meets with the injection water coming in through I, is condensed, and falls with the water to the bottom of the condensing-chamber and through the pipe D into the blow-through pipe B; but at the moment the exhaust-port of the engine opens, near the end of the stroke, the valve *a* is suddenly closed by the engine, which sends the exhaust steam with a sudden puff through the blow-through pipe and valve *d* into the hot-well, forcing out the water that

had accumulated in said pipe. The valve *a* remains closed but a short time—say, during the last one or two inches of the stroke—when it again opens, allowing the rest of the steam to pass into the condensing-chamber, as before, and this operation is continuously repeated. The valve *b* is closed by the pressure of the steam in B during the process of blowing through. The foot-valve *d* is kept closed by atmospheric pressure, except when blowing through. There is a constant vacuum in the condensing-chamber and a vacuum on the piston, and throughout the instrument, except during the time the valve *a* is closed, which is about equal to or less than the period of compression. The injection water is forced into the condensing-chamber by atmospheric pressure. A portion of the water in the blow-through pipe is forced by the steam into the heater along with some of the steam, and when the valve *a* opens the pressure of the steam closes the valve *c* so as to retain the steam and hot water within the heater, thus furnishing feed-water of the temperature of about 212°.

The arrangement of the filtering-chamber within the heater is no part of my invention. I am also aware that I am not the first to propose sending a portion of the exhaust steam into a closed vessel to heat the feed-water. I only claim the use of this heater, in combination with the other parts of this invention, when the water is blown into the heater by the steam, as above described.

The particular proportions, position, and arrangement of the blow-through pipe, exhaust-pipe, and condensing-chamber may vary, according to circumstances. The condensing-chamber may surround or contain the blow-through pipe, instead of being placed by its side or above it.

The leading principle of this invention is a blow-through pipe and condensing-chamber with a passage between them, which is alternately opened and closed so as to allow the exhaust steam to either flow into the condensing-chamber to be condensed or to send it through the blow-through pipe to carry out the water of condensation, substantially as described.

What I claim as new, and desire to patent, is—

A condenser for steam-engines, composed of the blow-through pipe B and condensing-chamber C, and operating substantially as described.

2. The heater G, when combined with the

blow-through pipe B and condensing-chamber C, when operating as described.

SIMEON A. GOODWIN.

Witnesses:

ABRAM TWICHELL,
JOHN HOLESOUSE.