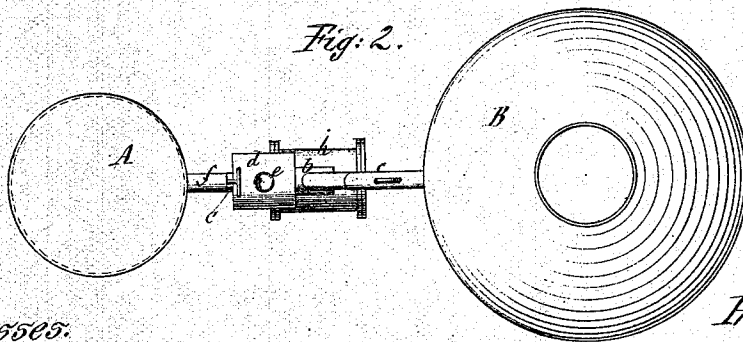
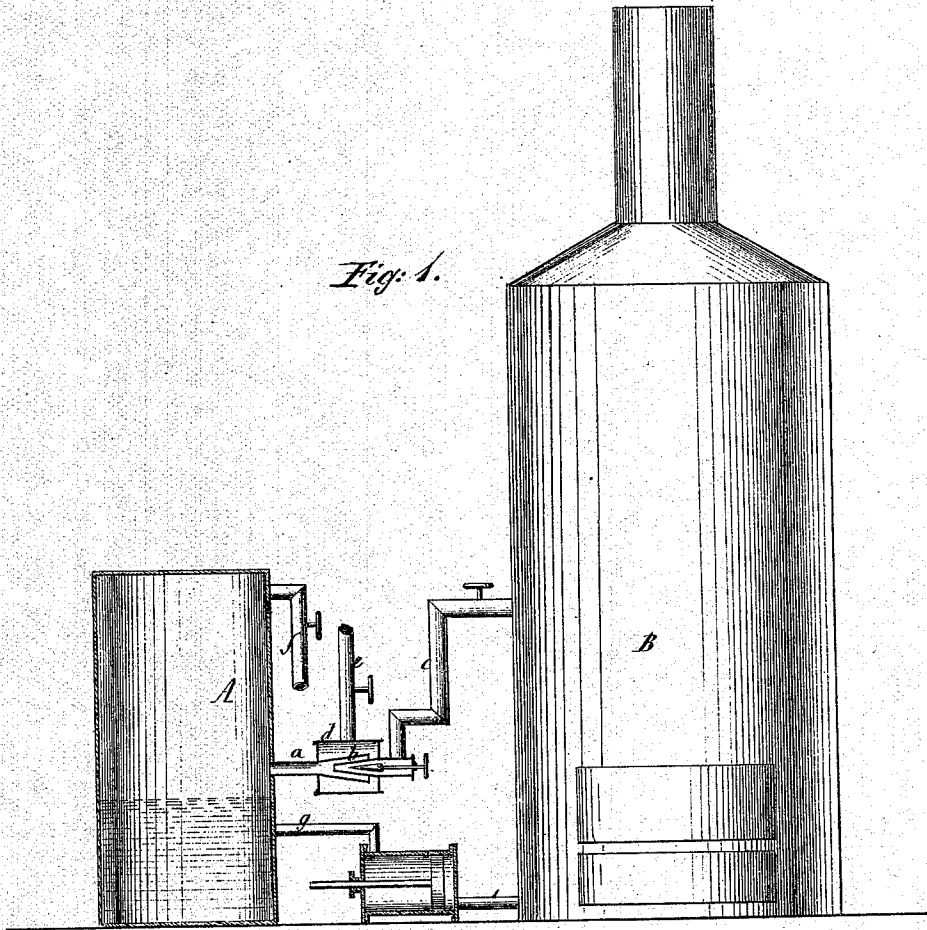


*H. Gerner,*

*Boiler Feeder.*

*No. 104,573.*

*Patented June 21, 1870.*



*Witnesses:*  
*l. Wablers*  
*Rud Langmeister*

*Inventor:*  
*Henry Gerner*  
*By Vansantorn Mauss*  
*his atty*

# United States Patent Office.

HENRY GERNER, OF NEW YORK, N. Y.

Letters Patent No. 104,573, dated June 21, 1870.

## APPARATUS FOR UTILIZING THE EXHAUST STEAM OF STEAM-ENGINES.

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

To all whom it may concern :

Be it known that I, HENRY GERNER, of the city, county, and State of New York, have invented a new and improved Apparatus for Utilizing the Exhaust Steam of Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a sectional side elevation of this invention.

Figure 2 is a plan or top view of the same.

Similar letters indicate corresponding parts.

This invention consists in a receiver, into which the exhaust steam of a steam-engine is driven by the action of a jet of steam and water taken from a steam-generator, and from the top of the receiver the steam is taken to drive the engine, while the water accumulating in its bottom part is pumped back into the steam-generator in such a manner that no portion of the latent heat of the exhaust steam is lost, the said exhaust steam being mixed with the live steam in the receiver while the water is pumped back into the generator, and by these means a large percentage of heat generally wasted by allowing the exhaust steam to escape in the atmosphere, or by condensing it in a condenser, is saved.

In the drawing—

The letter A designates a receiver, from the side of which extends a pipe, *a*, connected to a jet, *b*, which receives the water saturated with steam from a steam-generator, B, through a pipe, *c*.

The jet is inclosed in an air-tight jacket, *d*, which connects, by means of a pipe, *e*, with the exhaust-port of a steam-engine.

From the top part of the receiver extends a pipe, *f*, through which the engine is supplied with steam, and another pipe, *g*, which extends from the lower portion of the receiver, is connected to a pump, *h*, which communicates, through a pipe, *i*, with the steam-generator.

After steam of a sufficient pressure has been raised in the generator, the stop-cock of pipe *c* is opened, and the water, saturated with steam, rushes through the jet into the receiver, when the steam separates from the water, the steam being taken to the engine.

The exhaust steam of the engine passes through the pipe *e* into the jacket *d*, and is carried, by the action of the steam jet, into the receiver A, where it mingles with the live steam and water, the water accumulating in the bottom part of the receiver being pumped back into the steam-generator.

During this process the latent heat, being disengaged from that portion of the exhaust steam which condenses, is not wasted, but it serves to increase the heat, and, consequently, the pressure of the non-condensed portion of the exhaust steam, enabling the same to mingle with the live steam, and to be conducted back to the engine.

No heat is wasted, therefore, in my apparatus, except what is lost by radiation or leakage, and the same water is used over and over again, so that no supply of fresh water is required except what is needed to make up for the loss by leakage, though it cannot be denied that a certain loss of power will result from the operation of the pump required to return the water to the generator; also, from the diminished tension of the steam employed for working the engine, and from the back pressure which will or may be caused by the action of my apparatus on the exhaust steam, and the exact amount of gain resulting from my apparatus, or, in other words, the correctness of the theory set forth in the above description, can only be determined by future experiments.

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

The arrangement of a receiver, into which the exhaust steam from a steam-engine is driven by the action of a jet of live steam and water taken from a steam-generator, and from which receiver steam is taken to drive the engine, while the water accumulating in the bottom part thereof is pumped back into the steam-generator, all substantially in the manner and for the purpose herein shown and described.

This specification signed by me this 7th day of April, 1870.

HENRY GERNER.

Witnesses:

W. HAUFF,  
C. WAHLERS.