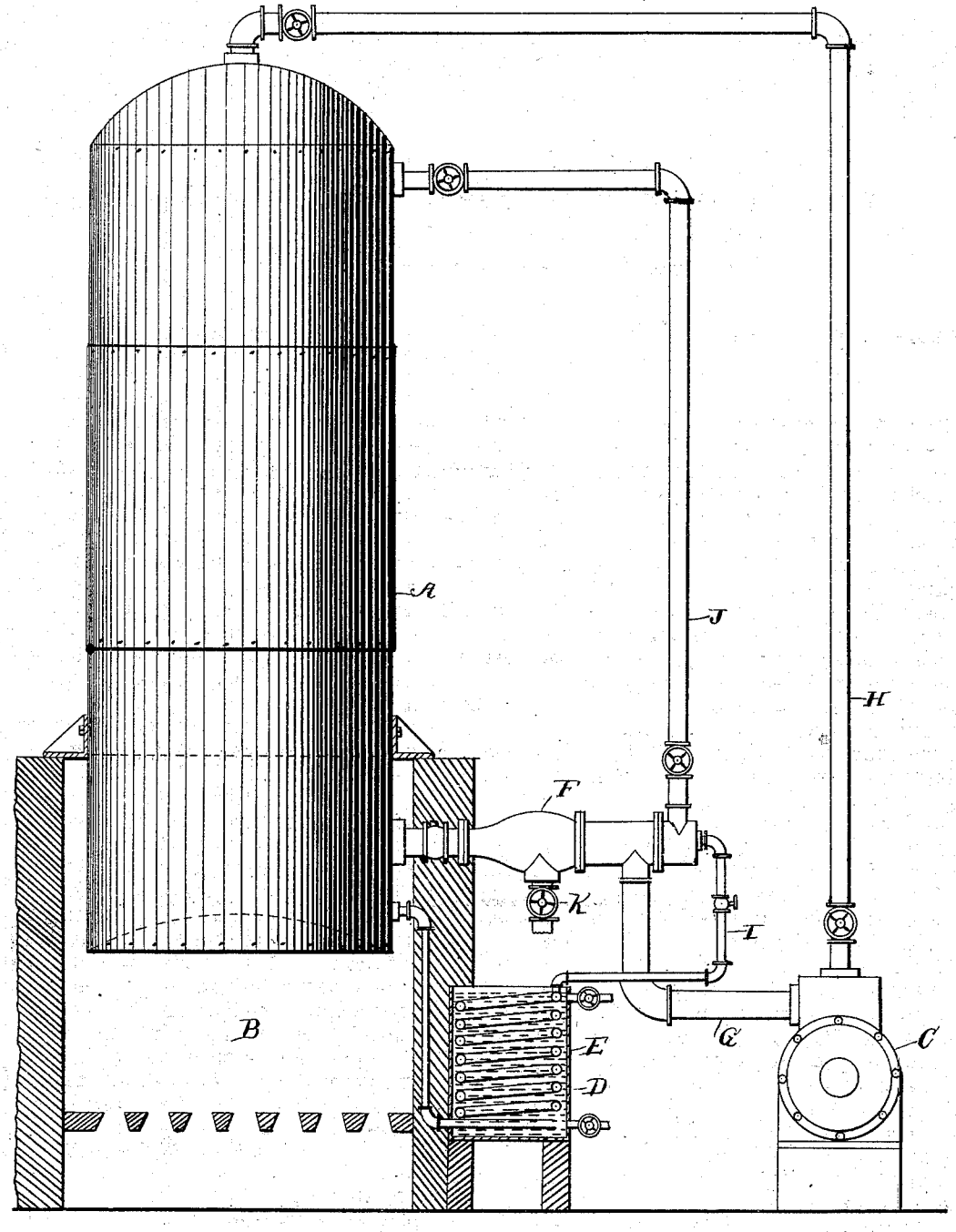
(No Model.)

D. RENSHAW.

UTILIZING EXHAUST STEAM.

No. 274,975. Patented Apr. 3, 1883.



WITNESSES

Chas. R. Burt

W. E. Bowen.

INVENTOR

David Renshaw

per O. E. Duffy

Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF BRAINTREE, MASSACHUSETTS.

UTILIZING EXHAUST-STEAM.

SPECIFICATION forming part of Letters Patent No. 274,975, dated April 3, 1883.

Application filed January 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, DAVID RENSHAW, of Braintree, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Process of Utilizing Exhaust-Steam; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form part of this specification.

This invention has for its object the utilization of the exhaust of engines; and it consists in taking water from the working-boiler and cooling the same, and also taking live steam from the steam-space of the boiler, and, by means of the two operating in an injector, forcing the exhaust directly into the water-space of the boiler from which it was taken.

The accompanying drawing shows an elevation with the cooling or refrigerating apparatus in section.

A designates the boiler, B the furnace, and C the engine. D is the cooling-vessel, and E the cooling-water coil. F is the injector, and G the exhaust-pipe. H is the live-steam pipe to the engine, and J the live-steam pipe to the injector, and I the water-pipe leading to the injector from the water-coil, which leads from the boiler; and K, a pipe for inducing a current when necessary by blowing off and then suddenly closing the valve.

The operation is as follows: Steam being raised in the boiler, and the engine being started, water is let into the coil in the cooling-vessel and live steam to the injector, all the valves controlling these pipes being opened as near simultaneously as possible. The injector now being in full operation, the exhaust is taken direct from the engine and forced into the water-space of the boiler. The water used for cooling the boiler-water in the coil is heated, and may be used for any useful purpose. After steam is raised only a small fire will be required to maintain the heat in the boiler and to keep up steam.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The process herein described for the utilization of the exhaust of engines, consisting in taking water from the working-boiler and cooling the same, taking live steam from the steam-space of the boiler, and, by means of the two operating in an injector, forcing the steam of the exhaust of the engine directly into the water-space of the boiler from which it was taken.

2. The combination of means for utilizing the exhaust of engines, consisting of the boiler, the cooling-coil, the exhaust-pipe, the live-steam pipe, and the injector, as set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

DAVID RENSHAW.

Witnesses:

B. F. MORSELL,

EUGENE D. CARUSI.