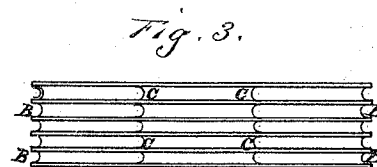
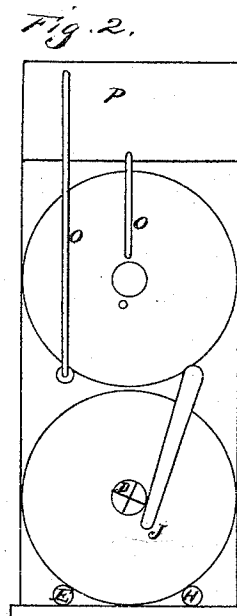
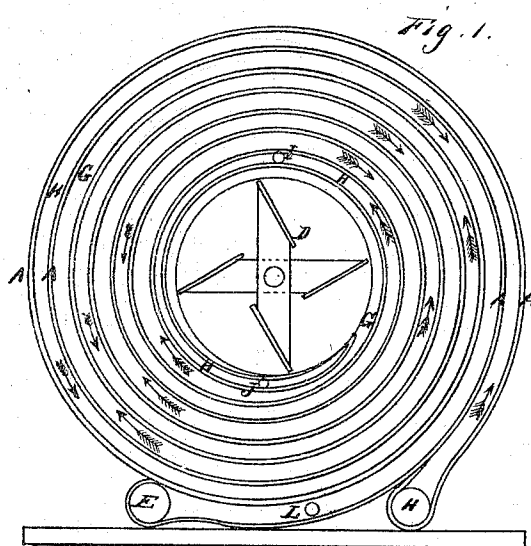


W. M. JACKSON.
Heaters and Blowers.

No. 142,397.

Patented September 2, 1873.



Witnesses

John L. Borne
C. W. Richardson

William Marcus Jackson
per Sewey & Co
attys

UNITED STATES PATENT OFFICE.

WILLIAM M. JACKSON, OF WOODLAND, CALIFORNIA.

IMPROVEMENT IN HEATERS AND BLOWERS.

Specification forming part of Letters Patent No. **142,397**, dated September 2, 1873; application filed February 24, 1873.

To all whom it may concern:

Be it known that I, WILLIAM M. JACKSON, of Woodland, Yolo county, State of California, have invented a Heater and Regenerator; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention without further invention or experiment.

My invention relates to a novel device and arrangement which I call a heat returner or regenerator; and it consists, mainly, in the employment of a fan-blower within a peculiar mechanism, by which the current of escaping heat, either in the form of exhaust steam from the engine or the products of combustion on their way to the chimney, are caused to act upon a current of air which is moving in a contiguous passage, and which is thus made to absorb most of the escaping heat and return it to be used over again in the form of a blast for the furnace, while the condensed steam is employed as feed-water to be used over again in the boiler.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a side view, showing a vertical section of my invention. Fig. 2 shows the manner of using two regenerators together. Fig. 3 is an enlarged section, showing the manner of uniting the plates.

A A are sheets of copper or iron, of a length and width suitable for the size of the engine or machine which they are intended to be used with. These sheets are rolled so as to form a coil, as shown, the sheets being separated from one-half an inch upward, as the case may require, and they have end pieces B, which hold them in place. Other pieces, C, may be placed at intermediate points to support the thin sheets, if they are wide. These pieces I prefer to make of a U shape, as shown in Fig. 3, their outside edges being riveted through the sheets, and holding them in place so as to form two curved passages, G H, extending the entire length of the coil from its inner to its outer end. One of these passages, G, opens at the inner end of the coil, and is so arranged that it receives the blast from the fan D. The outer end of this passage communicates

through the opening E with the furnace or fire-place by means of suitable pipes. The other passage, H, receives exhaust steam from the engine, and this passes around the coil in the manner above described for the movement of the air, thus gradually imparting its heat to the air until it arrives near the center of the coil. At the upper part of the last turn of the passage H, in some cases, a water-pipe, I, is introduced, and the remaining steam is thus condensed so as to form water, which is discharged from the pipe J, and is thence conveyed by a pump to the boiler at a high temperature. The air which has passed through the passage G and become highly heated is carried to the fire, as above described, and, in case it is found necessary, a jet of steam can be admitted through the pipe L to slightly moisten the air previous to admitting it to the furnace, or, when work is stopped, the fire can be effectually deadened by increasing the quantity of steam. The action will then be illustrated by the arrows, which show how the heat passes onward with the steam, and is perpetually carried back by the air which is forced through by the fan D.

In some cases ten coils may be employed, either side by side or one above the other, as at Fig. 2. In this case the steam, instead of being finally condensed in one coil, is led from its exit-pipe J to the other coil, through which it moves by one passage, and thence passes in a thin stratum a current of water in the other passage, by which it is completely condensed, the water circulating in pipes o o from tank P. By using this condensed water again in the boilers the difficulty of incrustation is almost entirely avoided.

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

The coiled plates A, forming the passages G H, in combination with the internal blower D, all constructed, arranged, and operating as set forth.

In witness whereof I hereunto set my hand and seal.

WILLIAM MARCUS JACKSON. [L. s.]

Witnesses:

JOHN L. BOONE,
C. M. RICHARDSON.