

(No Model.)

T. SYKES.
FUEL ECONOMIZER.

No. 565,643.

Patented Aug. 11, 1896.

FIG. 1.

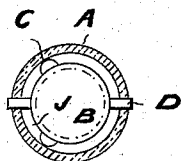
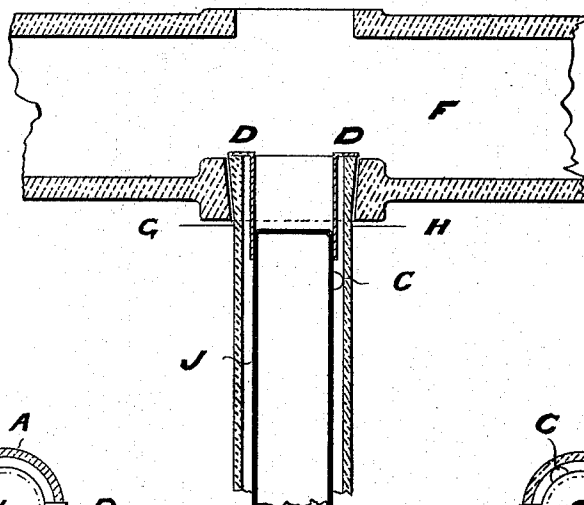


FIG. 2.

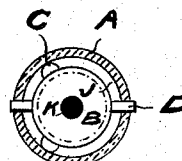
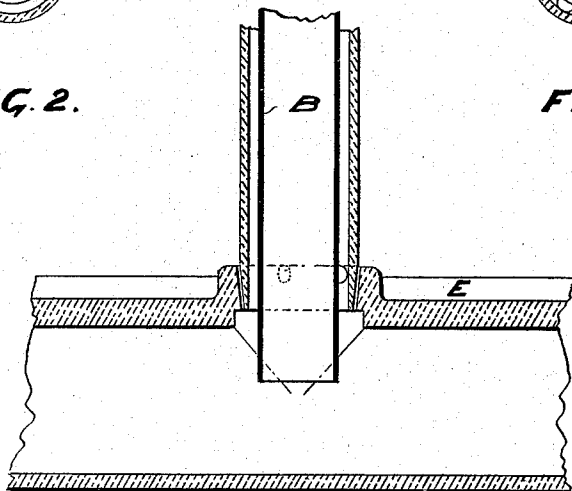


FIG. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS SYKES, OF MANCHESTER, ENGLAND.

FUEL-ECONOMIZER.

SPECIFICATION forming part of Letters Patent No. 565,643, dated August 11, 1896.

Application filed July 20, 1895. Serial No. 556,617. (No model.) Patented in England July 11, 1894, No. 13,409.

To all whom it may concern:

Be it known that I, THOMAS SYKES, a subject of the Queen of Great Britain and Ireland, residing at Manchester, in the county of Lancaster, England, have invented certain Improvements in and Relating to Fuel-Economizers for Heating Boiler Feed-Water, (for which a patent has been granted to me in England, No. 13,409, dated July 11, 1894,) of which the following is a specification.

My invention relates to that class of fuel-economizers in which the feed-water is passed through vertical pipes exposed to the heat of the waste gases, and has for its object an improvement in the circulation of the feed-water and the raising of the same to a higher temperature than hitherto.

In order that my said invention may be better understood and more easily carried into effect, I have hereunto annexed a sheet of drawings, wherein I have shown so much of a fuel-economizer as is necessary to illustrate the nature of my said invention.

In the drawings, Figure 1 is a vertical sectional view of the application of my said invention to one pipe of a fuel-economizer of ordinary construction. Fig. 2 is a sectional view in plan through the line G H in Fig. 1; and Fig. 3 is a similar view to Fig. 2, showing a modification of my invention.

I am aware that an attempt has been made to improve the circulation within an economizer by the introduction of a pipe of smaller diameter within the pipe ordinarily employed. In the previous attempt, however, the direction of the flow of the feed-water was changed from that ordinarily used and the construction adopted necessitated the use of boxes divided at the top and bottom. The feed-water entered first the upper division of the top box and then passed downward through the inner pipe to the lower division of the bottom box, from which it passed into the upper division of the same box and was thus enabled to enter and ascend in the outer pipe and be delivered into the lower division of the top box. Both ends of the inner pipe were fully open. Thus the feed-water flowed in two different directions—one downward through the inner pipe and the other upward through the space between the inner and outer pipes. This double direction of flow, obtained in the manner and by the aid of the special construction as described, was the essential feature of the previous attempt to improve the circula-

tion of the feed-water through an economizer by the introduction of inner pipes of smaller diameter into the vertical pipes of ordinary size.

In my invention I do not change the construction of the top and bottom boxes nor the point at which the feed-water enters, which is, as usual, at the bottom box. Instead of endeavoring to obtain a double direction of flow of the feed-water, my invention has for its object the preservation of the usual direction of flow and results in the better heating of the feed-water in its passage.

In carrying my said invention into effect I introduce within each of the vertical pipes A, contained in the economizer and fixed in the bottom box E and top box F, a pipe B of smaller diameter, which can conveniently be retained in position within the pipe A by distance-pieces C. The pipe B is suspended by brackets D in the manner shown, but it may be held in its true vertical position in other ways, as will be readily understood. I close, as shown in Figs. 1 and 2, the upper end of the pipe B, or it may be provided with a small hole or aperture, as at K in Fig. 3, so as to be partially closed. In this way the whole or the greater part of the feed-water entering the bottom box E is compelled to pass through the annular space J in rising into the top box F. I am thus enabled to heat the water more rapidly and to a higher temperature, as a less body of water is subjected to the hot gases surrounding the outer pipe. The water so heated can rise rapidly into the top box and pass away to the feed of the boiler and the like.

What I claim as my invention is—

In combination, the outer tubes A, the inner tubes B closed at their upper ends excepting the small hole K and arranged to leave an annular space between the tubes, and the brackets for suspending the inner tube at the top of the outer tube, said brackets having spaces between them forming continuations of the annular space between the outer and inner tubes, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS SYKES.

Witnesses:

JNO. GILL,
JOHN WAUGH.