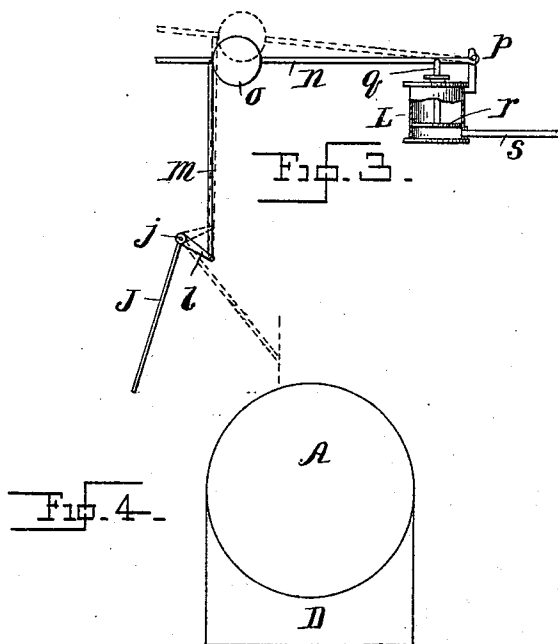
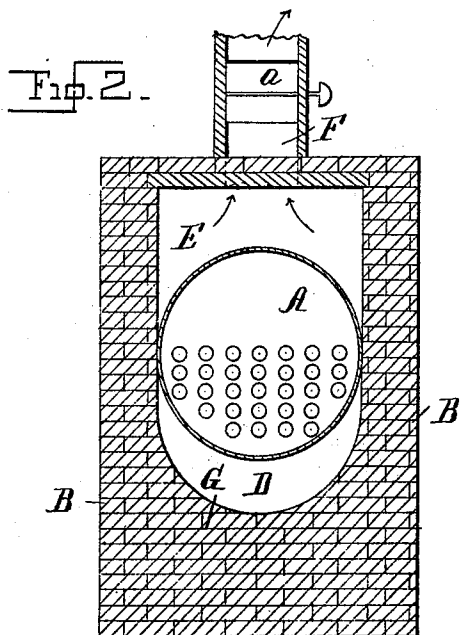
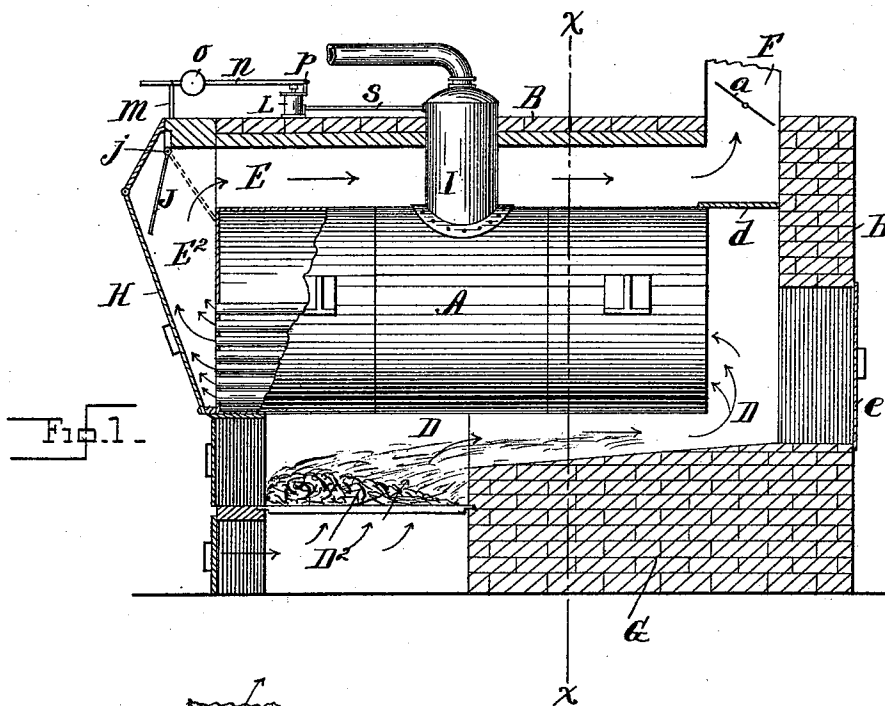


(No Model.)

R. E. DIETZ.
STEAM BOILER.

No. 516,369.

Patented Mar. 13, 1894.



Witnesses
J. H. Duffie
J. K. Deuell

Inventor
Robert E. Dietz
By HIS ATTORNEY
William A. Courtland

UNITED STATES PATENT OFFICE.

ROBERT E. DIETZ, OF NEW YORK, N. Y., ASSIGNOR OF ONE-THIRD TO
WILLIAM K. PALMER, OF SAME PLACE.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 516,369, dated March 13, 1894.

Application filed April 2, 1892. Serial No. 427,558. (No model.)

To all whom it may concern:

Be it known that I, ROBERT E. DIETZ, a citizen of the United States, and a resident of New York city, county and State of New York, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

The object of my invention is to reduce the amount of fuel required, and give a more complete consumption of the products of combustion, over the boilers heretofore in use.

The invention consists in the combination of a tubular or flue boiler with a flue or passage for heat, or products of combustion located beneath the boiler, and a heat chamber over the boiler; the former flue or passage connects with the boiler flues at one end of the boiler, and the heat chamber being connected with the opposite end of the boiler, whereby the heat or products of combustion will pass under the boiler, through it and over it, and be wholly utilized by the time it reaches the uptake.

The invention also consists in a steam regulated damper to control the passage of the heat or products of combustion; also, in the novel details of improvement and combination of parts that will be more fully hereinafter set forth and then pointed out in the claims.

In order that the exact nature of the construction may be easily understood, the following drawings are annexed.

Figure 1, is a vertical longitudinal section of a boiler setting disclosing my invention. Fig. 2, is a cross section on the line X X Fig. 1. Fig. 3, is a detail sectional view of the damper regulator. Fig. 4, is a diagrammatic view of the boiler and bridge-wall.

In the accompanying drawings A, indicates a tubular or flue boiler having the flues open at both ends. Said boiler is suitably mounted in a suitable casing or setting B, a passage or flue being formed beneath the boiler, and a heat-chamber being situated over the boiler.

There is no communication between the chamber D, and the heat-chamber E, at the sides of the boiler, they being wholly separated as shown in Fig. 2. The heat-chamber E, communicates at one end to the uptake F, in which may be a damper *a*. At the front end of the boiler the fire box or grate *b*, communicates with the chamber D, and at the oppo-

site end the chamber D, communicates with the flues of the boiler A. The back part of the chamber D, is completely shut off from the heat-chamber E, say by a partition or jacket *d*. A door *e* in the rear casing B, permits access to the flues of the boiler for cleaning, also to the bridge wall G, which is shown solid to prevent the dissipation of heat. The forward ends of the flues of the boiler communicate with the heat-chamber E, through a passage E², which is formed by a shield or cover H, and is preferably hinged so as to be lifted to permit access to the boiler flues. The steam dome I, passes through the heat-chamber E.

In operation the heat, or products of combustion, pass from the fuel D², over the bridge wall G, into the chamber D, heating the under side of the boiler; thence through the boiler flues into the heat-chamber E, and over the top of the boiler to the uptake, heating the upper side of the boiler and the steam dome I. By the foregoing arrangement the heat or products of combustion are caused to traverse the boiler for a distance equal to about three times its length, thus tending to give a more perfect combustion, and at the same time the greater part of the heat will be applied to and absorbed by the boiler. By my improvement a great saving in fuel can be effected, as the major portion of the heat generated is absorbed by the boiler and its contents, the products that pass off through the uptake F, being comparatively cool.

J, is a damper adapted to close the chamber E, (as shown in dotted lines in Fig. 1.) This damper is shown pivoted as at *j*, and connected by a crank *l*, and rod *m*, with a lever *n*, having an adjustable weight *o*, (see Fig. 3.) This lever *n*, is jointed as at *p*, the weight *o*, is acted upon by a piston rod *q*, secured to a diaphragm *r*, in the steam cylinder L, which is connected to the steam dome I, by the pipe *s*. The weight *o*, can be set so that when the steam in the boiler A, has reached a certain pressure, the diaphragm *r*, in the steam cylinder L, will be forced upward, lift the lever *n*, and swing the damper J, shut, closing the heat-chamber E, so as to damp the fire. By this means the steam is prevented from exceeding the desired pressure, which must result in a saving of fuel.

In Fig. 4, I have shown in diagram a modified form of bridge wall, that is, the upper surface of the wall is flat and extends horizontally from one side of the casing B, to the opposite side, at the desired distance beneath the boiler A.

With my improved boiler I am enabled to reach a nearer state of perfect combustion than has ever yet been obtained, thus:—by causing the heat or products of combustion to travel about three times the length of the boiler, little if any smoke is thrown off.

Having thus described my invention, what I claim is—

1. In combination with a boiler having flues, the automatic damper J, dependent from the

pivot *j*, and operated to open and close the aperture between the eduction ends of the flues and the upper heat-chamber, for the purpose described.

2. In combination with a boiler having flues, the automatic damper J, dependent from the pivot *j*, on the shield H, for the purpose herein described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 28th day of March, 1892.

ROBERT E. DIETZ.

Witnesses:

WILLIAM K. PALMER,
WM. A. COURTLAND.