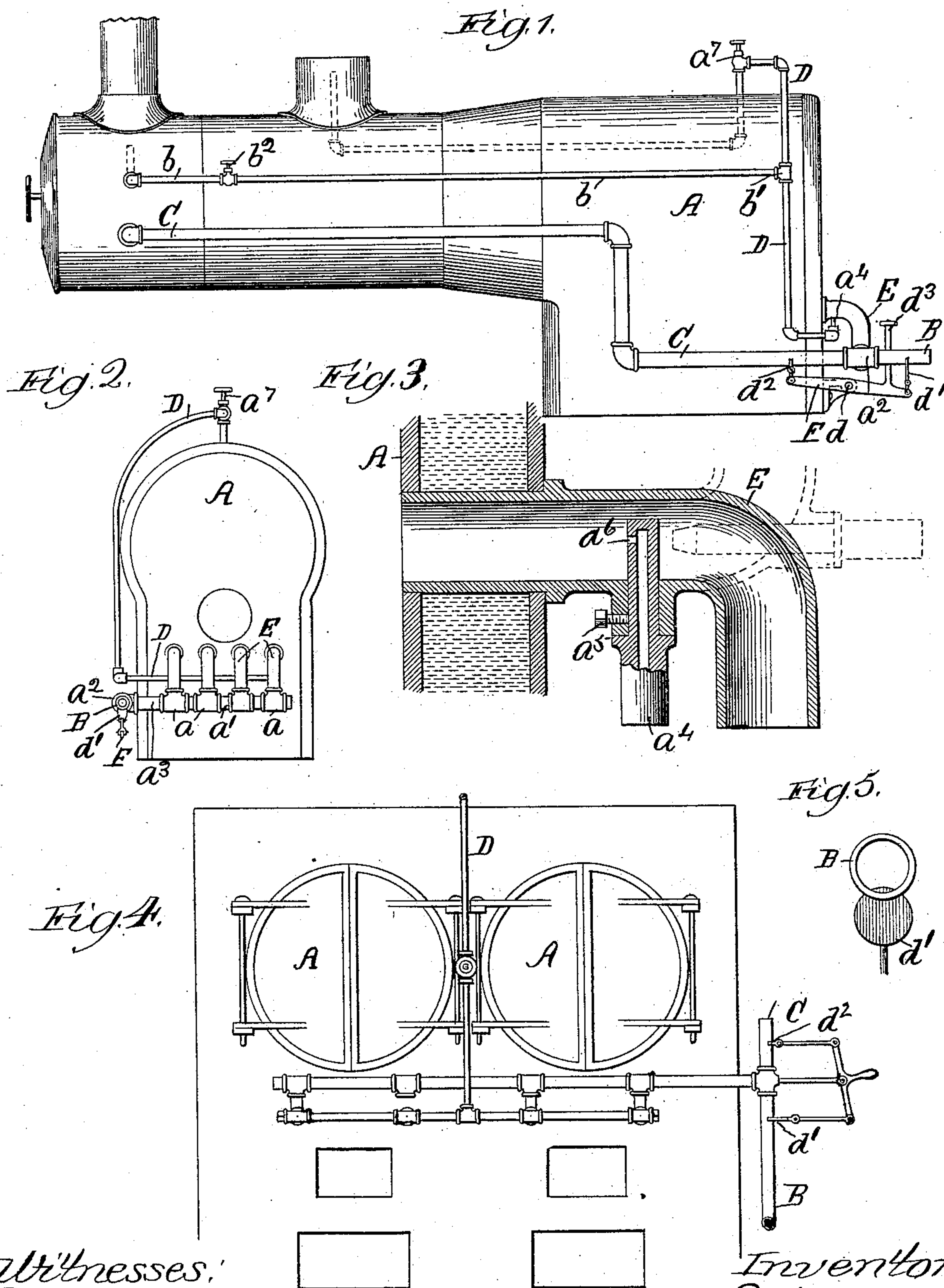


(No Model.)

E. KUNZER.
SMOKE CONSUMING DEVICE.

No. 486,582.

Patented Nov. 22, 1892.



Witnesses:
Chas. E. Gaylord,
Clifford H. White.

Inventor:
E. Kunzer.
By L. B. Coupland & Co
Attys.

UNITED STATES PATENT OFFICE.

EMIL KUNZER, OF CHICAGO, ILLINOIS.

SMOKE-CONSUMING DEVICE.

SPECIFICATION forming part of Letters Patent No. 486,582, dated November 22, 1892.

Application filed October 19, 1891. Serial No. 409,223. (No model.)

To all whom it may concern:

Be it known that I, EMIL KUNZER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Smoke-Consuming Devices, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a locomotive-boiler embodying my improvement; Fig. 2, an end elevation of the same; Fig. 3, an enlarged broken-away sectional detail; Fig. 4, a modification showing the application and adaptation of the device to stationary boilers, and Fig. 5 a detached detail of construction.

The object of this invention is to provide an improved smoke-consuming attachment that may be used either on locomotive or stationary steam-boilers, as will be hereinafter set forth.

Referring to the drawings, A represents the boiler; B, the cold-air pipe; C, the hot-air pipe, and D the steam-pipe through which the volume of steam is conducted to mix with the air-supply in promoting combustion. A number of curved injector-pipes E are used in conducting the combined steam and air into the furnace. The upper horizontal ends of these pipes are inserted through the double walls (see Fig. 3) of the boiler below the furnace-door, Fig. 2, and stop short with the surface of the inner wall and open at a point above the line of the grate-bars. The lower vertical ends of the pipes E are inserted in the T's a , which are connected by a number of nipples a' , forming a continuous connection. The hot and cold air pipes are connected at their inner ends by the T a^2 , as shown in Figs. 1 and 2. The nipple a^3 connects the T a^2 and the adjacent T a , thus conducting the air into each of the series of injector-pipes E. The upper end of the steam-pipe D is inserted in the boiler at some point where it is possible to receive the driest steam, and then extends down on one side of the boiler, Figs. 1 and 2, and runs along underneath the series of curved pipes E. A number of jet-tubes a^4 connect with the steam-supply pipe and extend up inside of the pipes E, Fig. 3, and are locked in place by the set-screw a^5 . The

upper ends of these jet-tubes are closed, the discharge-opening a^6 being on the side next the fire, so as to increase instead of retard the inflow of the air. The injector-pipes E may be placed in an inverted position and the injector tubes or nozzles inserted horizontally, as indicated by the dotted lines in Fig. 3.

The volume of steam admitted is regulated by the valve a^7 . Certain atmospheric conditions have the effect of creating a slow or sluggish draft, which causes an excessive volume of the gases given out by the process of combustion to accumulate in the furnace, so that when the furnace-door is opened a portion of this accumulated body of gas escapes into the cab. In order to obviate this, a pipe b connects with the steam-pipe D at b' and terminates in the smoke-box. The passage through this pipe is controlled by the valve b^2 , which when open will permit a portion of the gas to escape therethrough. The receiving end of the cold-air pipe B will ordinarily terminate some distance from the boiler, so as to lessen the very unpleasant sound that usually accompanies the admission of air when drawn in by a steam-jet. The hot-air pipe C runs back to the rear end of the boiler and opens into the smoke-box. The rocking lever F is pivoted, as at d , to the front of the boiler, Fig. 1, and has the disk valves d' d^2 attached to the respective ends thereof, a detail of one of the valves and its pipes being shown in Fig. 5. By means of the handle d^3 that end of the lever F may be raised or depressed. When depressed, as shown, the passage through the hot-air pipe is closed and the passage in the cold-air pipe opened. In the opposite position this condition is reversed. By this arrangement either cold or hot air may be supplied to the furnace in accordance with the varying conditions of the fire as the process of combustion progresses.

The modification illustrated in Fig. 4 shows the application of the improvement to stationary boilers, the only difference being that the arrangement and location of the pipes are changed somewhat, the operation, however, being the same.

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

In a smoke-consuming attachment, the com-

5 bination of the cold-air pipe, the hot-air pipe opening inside of the smoke-box, the curved pipes E, with which the cold and hot air pipes have a common connection, the steam-supply pipe, the injector tubes or nozzles inserted in the pipes E, the rocking lever, and the companion valves attached to the respective ends thereof and inserted, respectively, in the cold and hot air pipes and alternately closing the passage therethrough in accordance with the direction in which said lever is moved, substantially as and for the purpose set forth. 10
EMIL KUNZER.

Witnesses:

L. M. FREEMAN,
J. B. DONALSON.