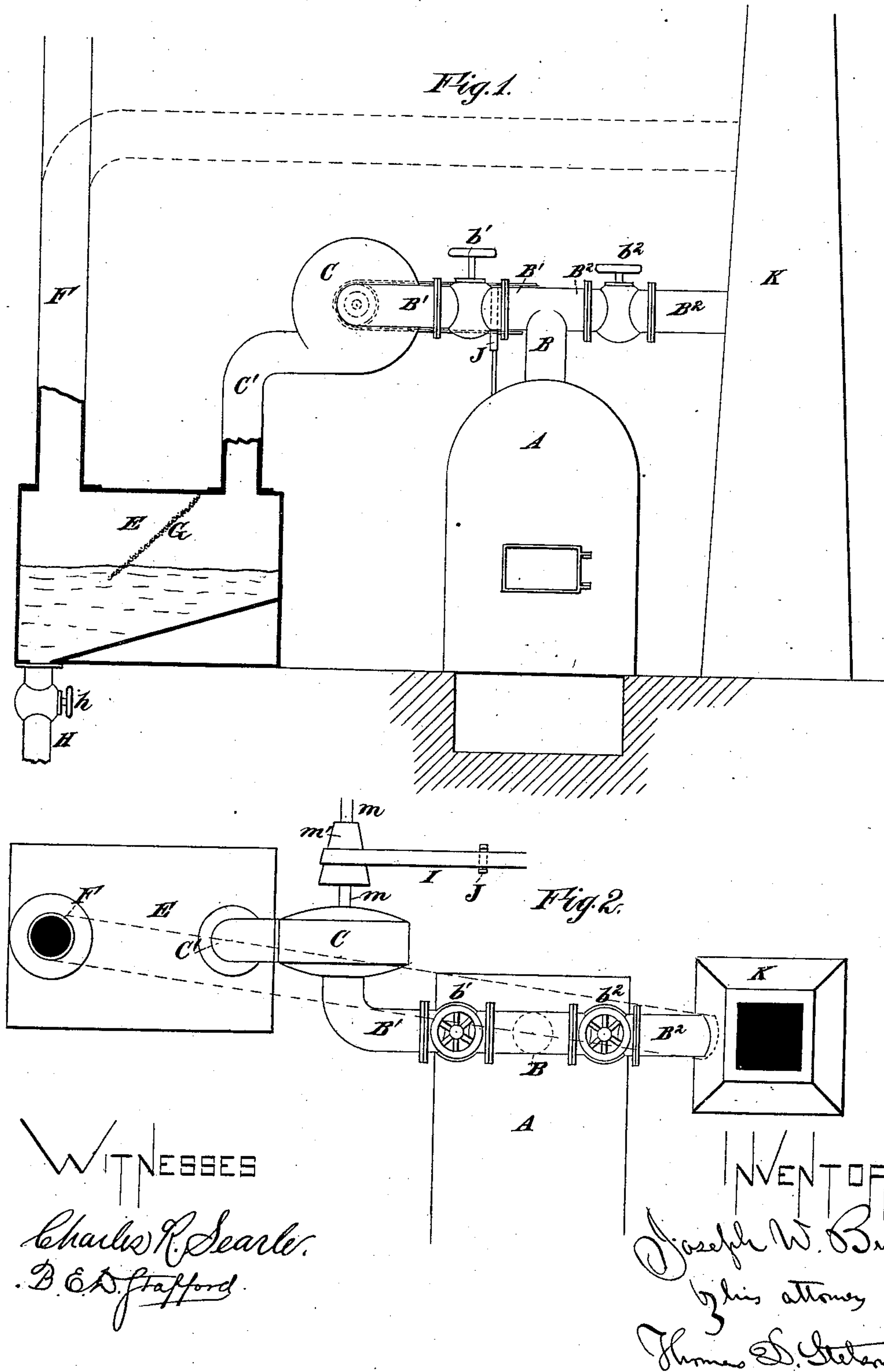


(No Model.)

J. W. BUDD.
SPARK ARRESTER.

No. 266,427.

Patented Oct. 24, 1882.



UNITED STATES PATENT OFFICE.

JOSEPH W. BUDD, OF NEW YORK, N. Y.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 266,427, dated October 24, 1882.

Application filed November 23, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. BUDD, of New York city, in the county and State of New York, have invented a certain new and Improved Spark-Arrester, of which the following is a specification.

The object of the invention is to secure an active draft in the furnace controllable at will, and to suppress entirely the emission of sparks, and to a great extent avoid the discharge of smoke.

I employ a blower mounted in the passage through which the exhaust products of combustion flow after their production in the furnace. The action of the fan or other blower induces a draft in the furnace proportionately to the speed with which the blower is operated. The gases, after their passage through the blower, are discharged into the upper portion of a chamber or vessel partially filled with water. An inclined strainer of wire-cloth or other foraminous material is mounted in the upper portion of the chamber, so as to positively prohibit the movement of large sparks along the air-passage over the water. The momentum with which the sparks are delivered downward into the chamber is usually sufficient to insure their projection into the water. The inclined strainer adds to the certainty with which this end is attained. The bottom of the chamber is properly formed and equipped with a valve through which the water may be discharged at intervals, a fresh supply being afterward introduced by any ordinary or suitable means.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is an elevation partly in section. Fig. 2 is a plan view.

Similar letters of reference indicate like parts in both the figures.

A is a boiler of the locomotive type, mounted on masonry with an ample ash-pit. The access of air to the latter may be controlled by a door, (not represented,) if desired.

B is an uptake-pipe, through which the gases are discharged from an ordinary smoke-box (not represented) at the back end of the boiler, and B' B² are branches thereof, controlled by tight-shutting valves b' b². The branch B' leads

to the center D of the casing C of a fan-blower, which, it will be understood, is driven at a high velocity by a belt, I, running upon a conical pulley, m', on the shaft m, from a reversed cone-pulley (not represented) driven by an engine. The fan blows the gaseous products of combustion through a pipe, C', vertically downward into one end of the top of a sufficiently capacious chamber, E, which is kept about half-filled with water. From the opposite end of the top a discharge-pipe, F, conducts the gases to a sufficient height and liberates them in the atmosphere.

About the mid-length of the chamber E is an inclined strainer, G, which extends from the top down something below the middle height. It is sufficiently open to allow a free passage for the gases; but all large sparks are arrested thereby. The bottom of the chamber E is inclined, as shown. To the lowest point in the bottom is connected a discharge-pipe, H, controlled by a tight valve, h.

The fan within the casing C is mounted on the shaft m, and is driven at a higher or lower velocity, according as the belt I is shifted from one position to another on the conical pulley m'. This change of position is effected by a shipper, J, which may be controlled by hand, or by a loaded diaphragm or other automatic device operated by the changes of pressure of the steam in the boiler A. When the belt I runs on the smallest portion of the pulley m' the velocity of the fan is the highest, and the effect of the fan is very powerful in inducing a partial vacuum in the furnace and stimulating the fire by a strong current of fresh air rising upward from the grate through the fuel, as will be understood. When the belt I is successively shifted to different positions nearer the large end of the pulley the velocity of the fan is reduced, and the effect on the combustion is less. The gaseous products are discharged from the fan with the high or low velocity, due to the position of the shipper J. Whatever their velocity, they are projected directly downward into the partially-filled water-chamber E. The solid particles or sparks by their momentum, as also by their gravity, are thrown directly downward into the water. The smoke, if any be present, is also exposed to a large surface of water, and is partially condensed. The gases thus freed in great part from any solid

matter contained therein move along the upper portion of the chamber E, and escape freely through the stack F.

The screen or strainer G extends across the entire gas-passage in the chamber E, and arrests any sparks which may chance to be carried along by the strong draft without being caught by the water. The inclined position of the screen causes the sparks to fall downward from the screen after their motion is arrested.

The branch B² from the uptake B leads directly to a stack, K, through which the gases may be discharged into the atmosphere in the ordinary manner, when desired, by simply opening the valve b² and closing the valve b'. When the apparatus is to be so worked the blower C may be stopped; or, if it is allowed to run, the blower and train of connected passages, including the water-vessel E, will be of no effect.

Modifications may be made in the details.

The style of the boiler may be varied indefinitely.

The valves b' b² may be simply tight-fitting dampers.

The blower may be varied by the substitution of any form of blowing device which is adapted to endure the temperature which is liable to sometimes obtain in the gases.

Parts of the invention may be used without the whole.

I can lead the discharge-passage F into the stack K, as indicated in dotted lines.

I can utilize a portion of the heat of the gases by passing them through radiators of any ordinary or suitable construction, being impelled by the blower C.

I claim as my invention—

1. The inclined strainer G, mounted in the partially-filled water-chamber E, set transversely across and covering the entire space above the water, in combination with the boiler A, blower C, and connecting-passages B' C' F, as herein specified.

2. The branch passages B' B², with their controlling means b' b², leading the one directly to a stack, K, and the other through the blower C, in combination with each other and with the partially-filled water-chamber E and passage F, as herein specified.

3. The partially-filled water-chamber E and inclined foraminous screen G, arranged in the passage between the boiler A and a flue, F, discharging into the atmosphere, in combination with the blower C, cone-pulley m', belt I, and shifter J, so as to vary the draft through the same, as herein specified.

In testimony whereof I have hereunto set my hand, at New York city, in the presence of two subscribing witnesses.

JOSEPH W. BUDD.

Witnesses:

CHARLES R. SEARLE,
W. L. BENNEM.