(No Model.)

A. CLARK.

APPARATUS FOR CLEANSING GAS.

No. 324,231. Patented Aug. 11, 1885.

FIG. 1.

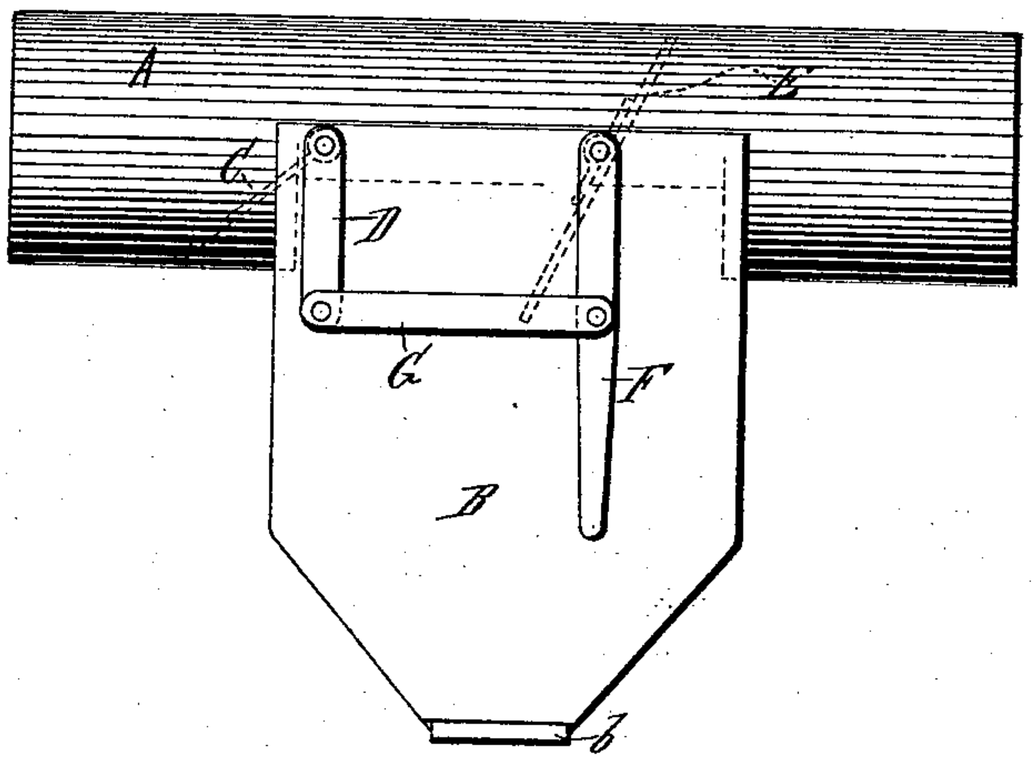


FIG. 2.

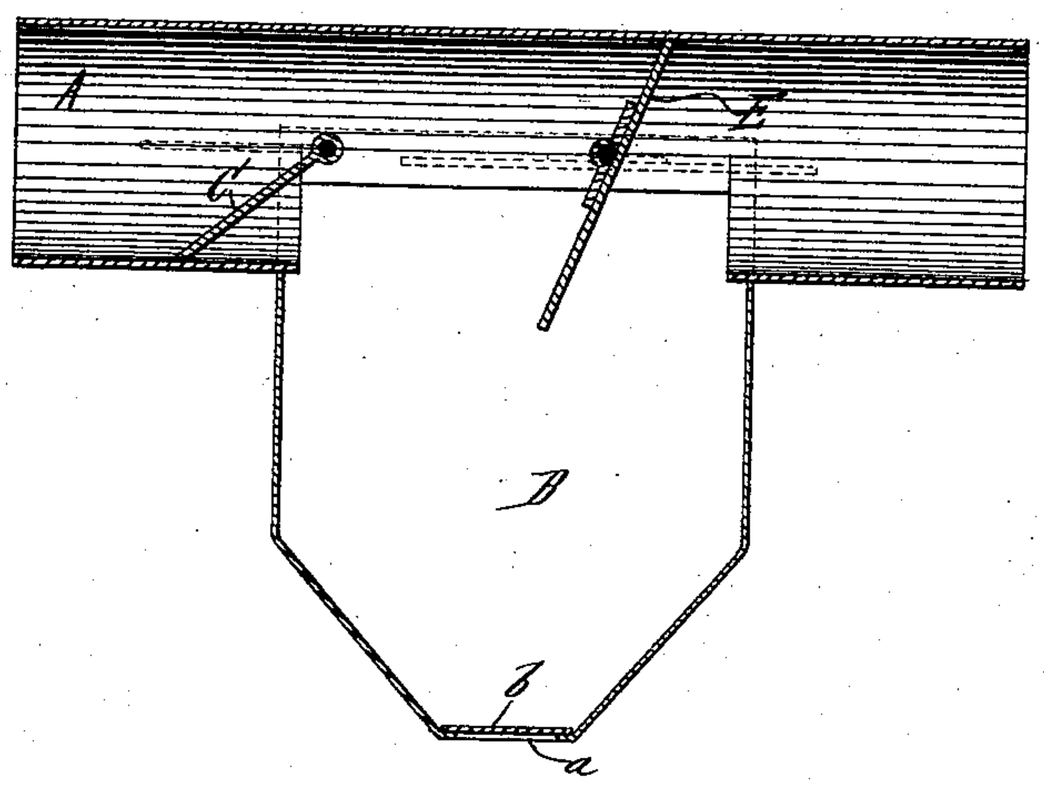
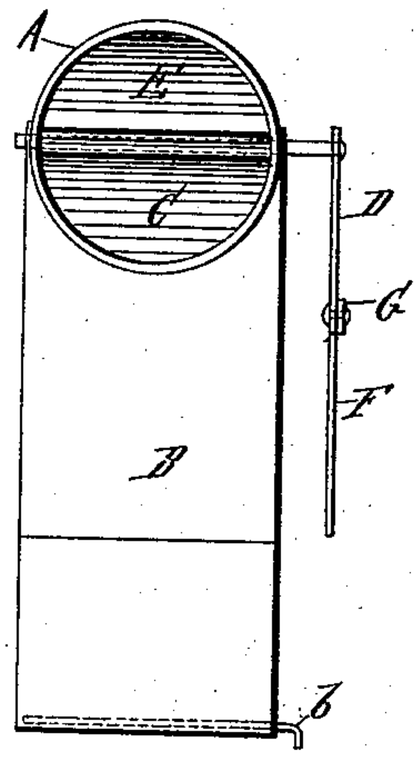


FIG. 3.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR CLEANSING GAS.

SPECIFICATION forming part of Letters Patent No. 324,231, dated August 11, 1885.

Application filed May 20, 1885. (No model.)

To all whom it may concern:

Be it known that I, AARON CLARK, of Jersey City, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Cleansing Gas, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention has relation to an apparatus intended to be located in or in connection with a pipe or conduit conveying gases or smoke, and serving to so arrest or interrupt the current as to cause the heavier particles therein to separate from the main current and be deposited in a suitable receptacle from which they may be withdrawn at pleasure.

The object of my invention is to produce a simple, cheap, and effective apparatus for the uses above named, one which will be convenient and easily operated, wherein the dampers or valves may be readily cleaned of any collections thereon, and from which the collected matters may be easily removed. To accomplish this, my improvements involve certain novel and useful peculiarities of construction, relative arrangements or combinations of parts, and principles of operation, all of which will be herein first fully described, and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation, Fig. 2 a longitudinal section and partial elevation, and Fig. 3 an end elevation, of an apparatus constructed and arranged for operation in accordance with my invention and involving the principles thereof.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

The improved apparatus may of course be used in any situation where its peculiar characteristics may be made available; but it is principally intended for use in connection with pipes leading from blast and other furnaces, and serving to convey gases and products of combustion therefrom to boilers or heaters, or elsewhere to perform any useful work. For instance, in blast-furnaces the residuum from zinc-furnaces is introduced for the purpose of producing what is known as "spiegel iron." The fumes and smoke from such a blast-furnace contain much of the oxide of zinc, a material valuable for many purposes, and which should not be present in the heated gases when employed for heating boilers, &c., for the reason that it coats the exposed surfaces thereof and seriously interferes with their heat-conducting powers. The gases above referred to are generally carried through some simple form of condensers for extracting some portions of the foreign matters, but without sufficient effect. At any convenient point in the gas conductor or pipe I locate my improved apparatus shown in the drawings.

A represents a circular or other shaped section suitable for joining with the gas-conduit and forming a portion thereof. From this section depends a chamber, B, opening at top into the section or portion A, and having a contracted lower portion in which is the discharge-opening *a*, closed by a simple stopper of any form, as by the sliding door *b*, which is movable from the exterior.

According to the construction shown in the drawings, C is a damper or flap mounted upon a suitable shaft, to which is attached an exterior operating arm or lever, D, and E is a second damper or flap, to the axis of which is attached a hand-lever, F, this second damper being about double the area of the first. The levers D and F are connected by a cross-bar, as G, so that both dampers may be moved together and at one operation. It should be understood, however, that the dampers, instead of being made movable, might be made stationary or in the form of immovable barriers, in which case the levers would be dispensed with, and under such construction the barriers would operate in the matter of deflecting currents of gas in the same manner as if movable.

The gases may enter from either side. On reaching chamber B, which forms an enlargement of the general conduit, they expand to fill said chamber, and their velocity is thereby checked and opportunity afforded to deposit some of the heavier particles which they convey. Suppose they come in from the left of Fig. 2, the dampers being in the position therein shown by the full lines. The gases are first retarded by the damper C, by which their velocity is checked, and they are compelled to pass over the top of said damper and strike against damper E, beneath which

they must turn before they can pass out of the apparatus. When they enter from the right, the gases are first retarded by coming in contact with E, and compelled to take the tortuous course under E and over C before they can find an exit, as will be readily seen. This retarding of the gases and compelling them to take the tortuous courses indicated affords a further opportunity for the heavy particles to settle to the bottom of chamber B by virtue of their own gravity, and the arrangement of the device is such that the gases are compelled to rise within the device before they can find an outlet, and while the lighter products may rise the heavier particles are not likely to do so. By turning the dampers to horizontal positions, as indicated in dotted lines, Fig. 2, the current is not materially impeded by the apparatus, and may proceed directly through the section A. By turning the dampers partly down the current is slightly impeded, and so the separation or cleansing may be regulated at pleasure. The collected products are withdrawn through the opening *a* after withdrawing the door *b*. Whatever portion of the heavy products may collect upon the dampers is removed by simply jarring them through the medium of the hand-lever, and it falls into the chamber B.

The movable dampers are preferred, for in case of an explosion they will be automatically lifted or turned so as to open full headway for the gases, and thus relieve the apparatus to a great extent and prevent damage thereto.

The device thus described will be found to cleanse the gases in a thoroughly efficient manner and to admirably answer the purpose or object of the invention above stated.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character herein set forth, the two dampers for retarding the current of gas and directing it over one and under the other, said dampers being located within the enlarged chamber having the opening at bottom, said dampers being connected with each other and arranged to be simultaneously operated from the exterior of the sediment-chamber, substantially as and for the purposes set forth.

2. The herein-described apparatus composed of the section for joining with the gas-pipe, the chamber or receptacle for receiving the deposit, the simultaneously-movable dampers, and the operating-levers connected therewith, substantially as shown and described, and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

AARON CLARK.

Witnesses:
JAMES MANNING,
E. M. SQUIERS.