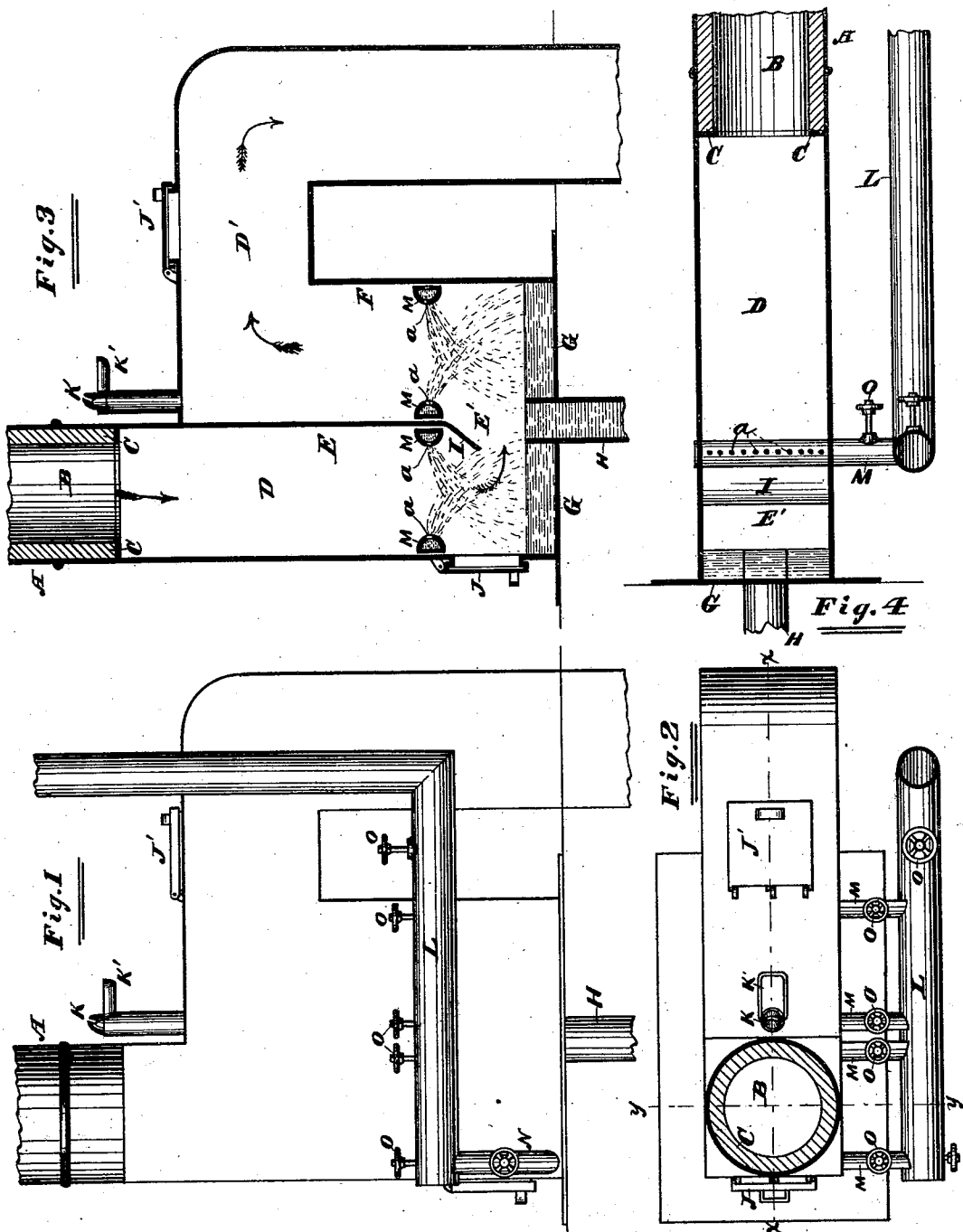


M. KENNEDY.
Gas-Cleaning Apparatus.

No. 228,765.

Patented June 15, 1880.



Attest:

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UNITED STATES PATENT OFFICE.

MARTIN KENNEDY, OF CHICAGO, ILLINOIS.

GAS-CLEANING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 228,765, dated June 15, 1880.

Application filed December 27, 1879.

To all whom it may concern:

Be it known that I, MARTIN KENNEDY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gas-Cleaning Apparatus, of which the following, in connection with the accompanying drawings, is a specification.

In the drawings, Figure 1 is a side elevation of an apparatus embodying my invention. Fig. 2 is a top or plan view thereof. Fig. 3 is a section in the plane of the line *xx* of Fig. 2, and Fig. 4 a section in the plane of the line *yy* of Fig. 2.

Like letters of reference indicate like parts.

The apparatus shown in the drawings is adapted to be applied to the lower end or part of the gas-receiver of blast-furnaces as the latter are usually constructed; but the essential features of my invention, as will hereinafter more fully appear, may be employed, generally, for the purpose of washing or cleaning gas in an impure condition, especially when mixed with ashes.

A represents the lower part or end of the gas-receiver of a blast-furnace. The exterior wall of this receiver consists, usually, of metal, and is lined with brick. B indicates the wall or lining of brick, and C is a flange or interior collar for supporting the wall B.

D is a chamber or receiver, forming an extension or continuation of the part or receiver A, and D' is a chamber or receiver annexed to the part D. E is a wall separating the chambers D and D', excepting that they communicate with each other through a large opening or port, E', arranged near their floors, as shown. F is a wall projecting vertically into the chamber D', but not extending to the top thereof.

In the drawings, the chamber D' is in the form of a double elbow, and hence there are two vertical walls shown therein, not extending to the top thereof, but connected at their upper ends. A circuitous chamber or receiver is thus formed, so that the gas, in passing through it, is carried vertically in different directions, as indicated by the arrows shown in Fig. 3; but a circuitous passage may be formed in various other ways for the same purpose, and I do not, therefore, here intend to restrict myself to the double-elbow form.

G is a floor extending from the wall F across

the receiver D, and H is a discharge-pipe entering the central part of the floor G and extending some way above it, as shown. In practice I extend this pipe about six inches above the floor.

I is an inclined flange or deflector arranged at the lower end of the wall E or over the port E', and also over the upper end of the pipe H, as shown. J is a door in the receiver D. Another door, J', may be arranged in the receiver D', if desired.

K is a gas-tip applied to a gas-pipe entering the receiver D', and K' is a shallow basin or shelf extending from the tip K. L is a water-pipe, supplied at its upper end by a hydrant or in any other suitable way. The lower or forward end of the pipe L is closed, and M M are distributing-pipes entering the receivers D and D' horizontally, and arranged against the walls thereof, as shown. Those parts of the pipes M M which are within the chambers or reservoirs D and D' are perforated, as shown at *a*, to throw small jets or spray across the said reservoirs in opposite directions, as indicated in Fig. 2. Slits or slots may be employed instead of the perforations. I deem it preferable, though not absolutely essential, to make the pipes M M flat where they are in contact with the walls of the reservoir, and inclined or beveled on their upper faces, as represented, so that the ashes will not lodge thereon.

N is a water-discharge pipe entering the lower part of the receiver D. It is to be understood, of course, that the pipes M and N enter the pipe L or some other pipe for the purpose of receiving their supply.

O O are cocks for the purpose of controlling the supply of water to the pipes M and N.

The pipe H enters or communicates with a sewer, drain, or other receiver of waste or refuse material.

The rear part of the chamber or receiver D' communicates with the hot-air-blast apparatus or heater of the furnace, and the cleansed gas is there utilized. It may also be conducted elsewhere for utilization.

The operation of the apparatus now described is as follows: The gas passes from the receiver A into the receiver or chamber D of my apparatus or attachment, and is drawn downward

through the same, and in reverse directions through the chamber or receiver D', and thence to the place where it is to be utilized. While the gas makes this circuit it passes between the pipes M M, and the jets or spray therefrom are impinged laterally against the volume of gas. The ashes and other impurities conveyed along with the gas are thus sufficiently saturated to prevent them from being carried farther, and they fall instead of being carried through the receiver D'. I allow water enough to pass through the pipe N to flood the floor G and pass off through the pipe H, thus keeping up a constant current through the said pipe. The ashes and other saturated impurities in falling alight upon the body of water on the floor G and are floated off through the pipe H into the sewer.

Should the floor G eventually become loaded with sediment which sinks thereto instead of floating off through the pipe H, this sediment may be removed with facility by opening the door J for that purpose.

To prevent the lighter impure particles from being conveyed entirely through the receiver D', I arrange a second pair of pipes, M M, in the said receiver or chamber; but this second pair of pipes or tubes is not absolutely essential, especially when the deflector I is employed, for the latter deflects most of the impurities upon the body of the water before they reach the port or opening E'. These impurities, especially the heavier parts, such as ashes, are cast with some force upon the deflector, and hence are thrown with certainty away from the said port.

The means employed for producing an air-blast through the furnace, aided by the means used for producing the hot-air blast, create a blast through the receivers D and D' sufficient to carry the gas and its accompanying impurities through them with considerable force.

The supply of water may be regulated with facility by means of the cocks O O, as already stated.

The jet K not only serves as a means for lighting the room or compartment in which the cleanser may be arranged, but also, to some extent, indicates the degree of purity of the gas escaping from the receiver D'.

If, either through excess of force of expulsion or on account of too much impurity remaining in the gas which is expelled through the jet K, the latter becomes extinguished, it will be again lighted by the igniting material in the tray or dish K', which material may consist of ignited soft coal.

I am aware that apparatus of this class have heretofore contained in their structure a supplemental gas-receiver communicating with the main receiver, and that either one or both of these receivers have contained spray pipes or tubes and one or more deflectors, for the purpose of furnishing a comparatively long and circuitous passage-way for the gas to be purified and for washing it of its impurities; but I do not here intend to claim such, broadly, but only in connection with the means I employ for collecting and floating off the coarser and heavier impurities and for supplying a light which shall, to some degree, test the purity of the gas which has been washed, and all of which is more explicitly set forth in my several claims hereunto subjoined.

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

1. The combination, substantially as described, in a gas-purifying apparatus, of the receiver D, having therein the port E', the spray-tubes M M, the induction tube or pipe N, and the discharge-pipe H, all arranged substantially as specified with relation to each other and the floor G, for the purposes set forth.

2. The combination of the receivers D and D', communicating with each other by means of the port E', arranged near the bottoms of the said cylinders, the spray tubes or pipes M M, the discharge-pipe H, and the deflector I, all arranged substantially as specified with relation to each other, for the purposes set forth.

3. The combination, substantially as specified, with the gas-receiver of a gas-cleaning apparatus, of the gas-tip K and the tray or dish K', for the purposes set forth.

MARTIN KENNEDY.

Witnesses:

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