A. ERNST.

GAS CLEANER.

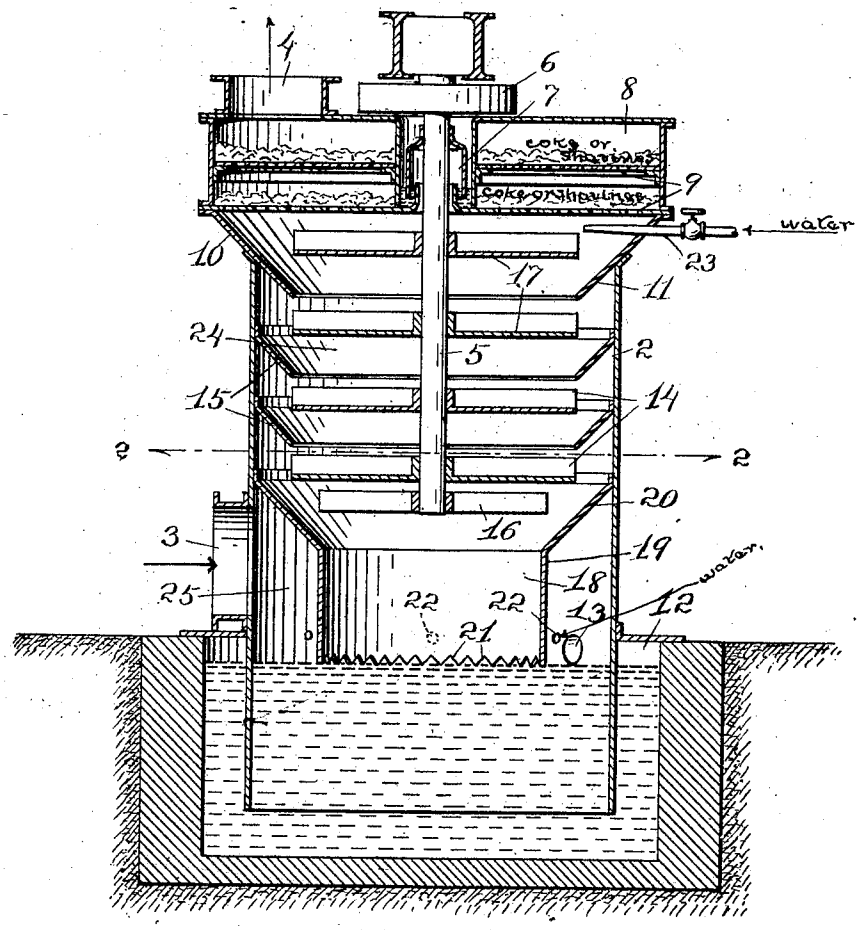
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1,079,849.

Patented Nov. 25, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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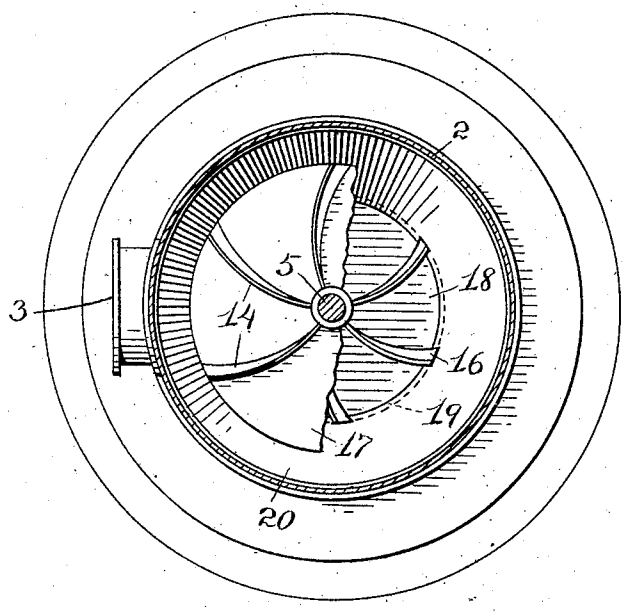
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2 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

ALFRED ERNST, OF PITTSBURGH, PENNSYLVANIA.

GAS-CLEANER.

1,079,849. Specification of Letters Patent. Patented Nov. 25, 1913.

Application filed December 13, 1912. Serial No. 736,596.

To all whom it may concern:

Be it known that I, ALFRED ERNST, a citizen of the United States, resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have made a certain new and useful Invention in Gas-Cleaners; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the invention, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a central vertical section of the invention. Fig. 2 is a section on the line 2—2, Fig. 1.

The object of this invention is to provide an improvement in apparatus for cleaning gas, particularly that from bituminous coal, and it consists in the novel construction and combinations of parts, as hereinafter set forth.

In the accompanying drawings, illustrating the invention, a casing is indicated by the numeral 2, having an inlet 3, for the gas at its lower portion, and an outlet 4, at its upper portion.

Through the top of the casing, which is designed to be of cylindrical character, extends a shaft 5, to the upper part of which is attached a driving pulley 6. Below the pulley, the entrance of the shaft into the casing is provided with a water seal device 7, in a central recess in the top, around which is a drying compartment 8, of annular form, provided with perforated racks 9, upon which drying material, such as coke or wood shavings, is placed. This portion of the casing is preferably of larger diameter than the body part below, in order to provide more room for drying material, and to cause the gas to pass through the compartment more slowly than through the body portion. The top portion of the casing may be connected to the cylindrical wall of the body part by an inclined wall portion 10, the lower part of which projects into the chamber of the body part in the form of a downward and inward sloping flange 11.

The casing is provided with a water holding drip connection, tank or cistern 12, at its bottom, which is preferably in the form of a water seal, the lower end of the wall of the casing extending down into the same, and an overflow pipe 13, being connected in proper position to provide a constant water level.

Within the casing the shaft 5, is provided with disks 17, and fan blades 14, in series one above another, sloping flanges 15 of the casing being respectively arranged between the disks and extending inward and downward from the casing wall toward the disks, the edges of which are substantially in vertical alinement with the edges of the flanges. In the construction shown the disks 17, are provided with fan blades 14. The lower flanges 15, of the casing may have the same slope as the flange 11, in the upper part. Fan blades 16, are secured to the end of the shaft below the series of disks 17. In the lower portion of the casing is provided a tubular partition passage 18, the wall 19, of which extends upward a short distance to join a sloping annular partition wall 20, which is attached to the inside of the casing wall. The tubular wall 19, of the passage is provided with a horizontal circumferential series of passages, notches or serrations 21, at or just above the water level, so that the casing is arranged to be separated by the water at the bottom thereof into an upper main chamber 24, and an annular compartment 25, below, around the main chamber, and into which the inlet at 3 provides for the entrance of the crude gas. Water discharge spouts 22, directed toward the serrations 21, may be provided in the casing around the passage 18, and, in the upper part of the casing below the drier compartment, one or more jets 23 are designed to be introduced, to provide additional water for use, in connection with the flanges and disks, in cleaning and cooling the gas.

In this apparatus it is designed to promote rapidity of action through simple construction. The heated gas entering the annular compartment in the lower portion of the casing passes inward through the serrations of the tubular wall 19, and through the water at the water level, in such wise that it is separated or subdivided by the action of these notches and the water into small portions in bubble form, whereby it is designed to be evenly distributed in its entrance to the main chamber. In this chamber it is drawn upward through the passages between the cylinder flanges and the disks, which are designed to be supplied with water from above. All of the crude and heated gas entering from the producer is

in this way immediately subdivided in small portions and subjected to the cleansing and cooling action of the body of water at the bottom of the casing. And much of the tar is eliminated, and to some extent the ammonia and soluble by-products are taken up by the water, after which the upward moving gas is subjected to centrifugal movement and active washing, through the operation of the rotary disks or ledges of the shaft, coöperating with the interior inclined flanges of the casing, in connection with the films and particles of vapor or water spray produced from the upper water supply. The inclination of the casing flanges and of the passage wall is designed to be about 45°, or sufficient to facilitate the downward flow or drain of solutions of extractive into the tank. Before passing the gas out of the apparatus it is caused to pass through the drying material on the racks in the upper compartment of the casing, where it is designed to be relieved of moisture, so that when it is discharged from the apparatus it is in condition for immediate use.

I claim—

1. Apparatus for cleaning gas, comprising a cylindriform casing having an interiorly flanged main chamber, a drier chamber in its top, perforated racks between the drier chamber and main chamber, an entrance chamber circumscribing the main chamber, an overflow water holding connection at the bottom of the casing, a tubular partition between the entrance chamber and the main chamber having a horizontal series of passages at the water level, and rotary disks and fan devices in the main chamber.

2. Apparatus for cleaning gas, comprising a casing having an overflow water-holding connection at its bottom, an interiorly flanged main chamber, an entrance chamber around the lower portion of the main chamber and constructed to separate the entrance chamber and the main chamber, a water supply to the main chamber, a series of rotary disks for commingling the water and gas in the main chamber, fan blades located in the main chamber, and separating the entrance chamber and the main chamber a tubular partition wall having an annular sloping upper portion and a horizontal series of passages substantially in the plane of the overflow.

3. Apparatus for cleaning gas, comprising a casing having a vertical series of inclined flanges, an overflow water-holding connection at the bottom of the casing, a drying compartment in its upper portion, below the drying compartment a washing chamber, perforations between the drying compartment and the washing chamber around the washing chamber an entrance chamber, a central passage communicating above with the washing chamber and below with the entrance chamber by a circumferential series of passages at the overflow level, a rotary shaft and a series of disks and fan blades on said shaft extending outward to the inclined flanges of the casing and arranged in vertical alternation with said flanges.

4. Apparatus for cleaning gas, comprising a casing having a series of inward and downward sloping circumferential flanges, a water seal drip connection, a water supply jet in the upper portion of the casing, an inward and downward sloping annular partition wall, a tubular partition wall extending from said annular partition wall to the water seal level, an entrance chamber around this partition wall, a rotary shaft, and connected to said shaft a series of horizontal disks in vertical alternation with said flanges, and fan blades in connection with said disks.

5. In apparatus for cleaning gas, a casing having at its top a drier compartment, at its bottom a water seal tank, between the drier and tank and communicating with both a washing chamber, a circumscribing entrance chamber, and a tubular draining partition wall extending downward from the casing wall and terminating, at the level of the water seal, in a serrated edge.

6. In gas cleaning apparatus, an overflow water holder, an open bottom cylindrical casing having its outer wall extending below the water level, an inner open-bottom tubular partition wall in its lower portion extending to the water level, an annular series of perforated racks in its upper portion, annular wall flanges between the racks and the partition wall, a spraying device above said flanges, and rotary disks and fan blades interior to and concentric with said wall flanges.

In testimony whereof I affix my signature, in presence of two witnesses.

ALFRED ERNST.

Witnesses:
B. F. Richards,
E. E. Elliott.