No. 815,674. PATENTED MAR. 20, 1906.

Q. BENT.

GAS PURIFIER.

APPLICATION FILED JUNE 23, 1904.

Fig. 1.

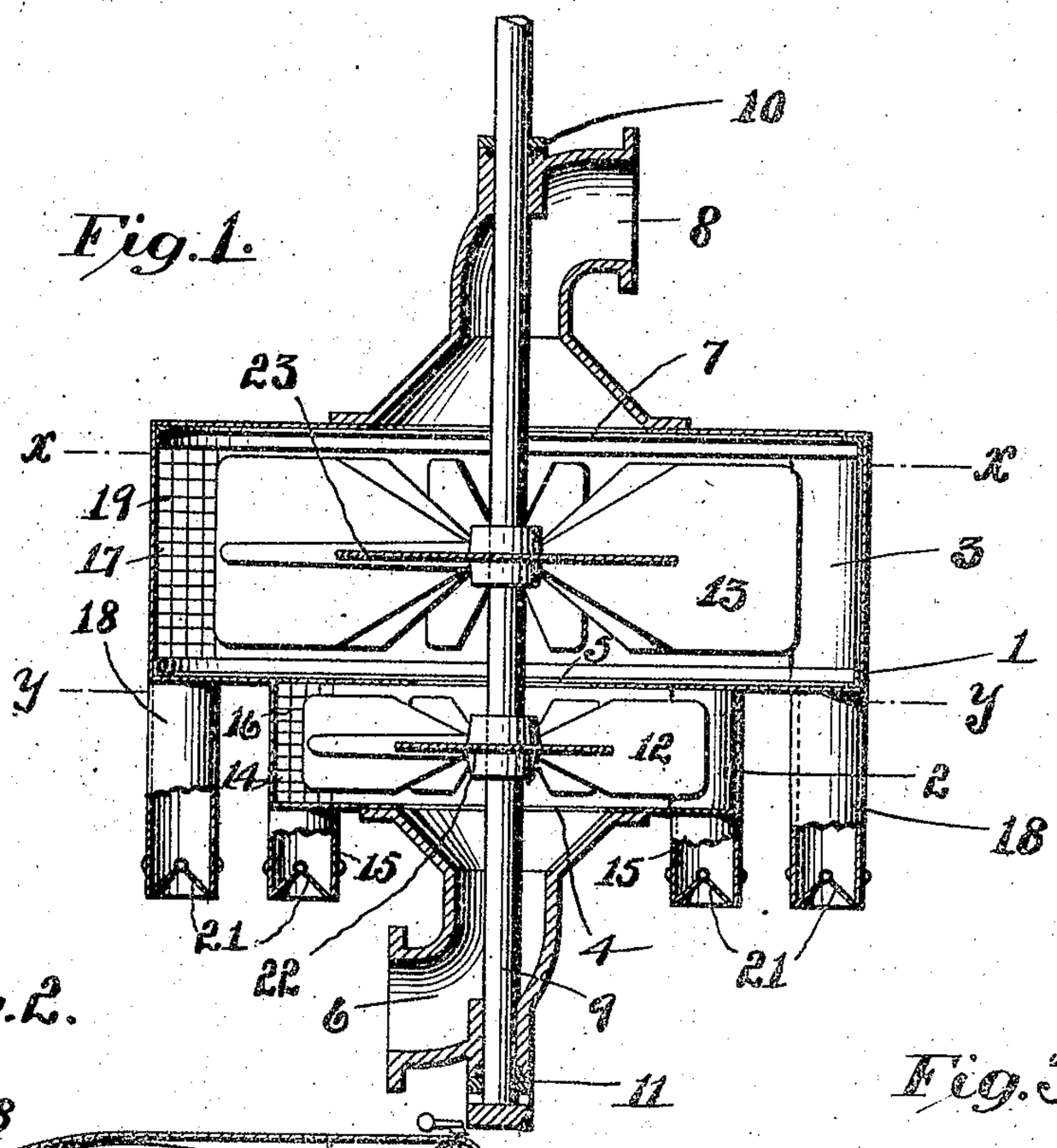


Fig. 2.

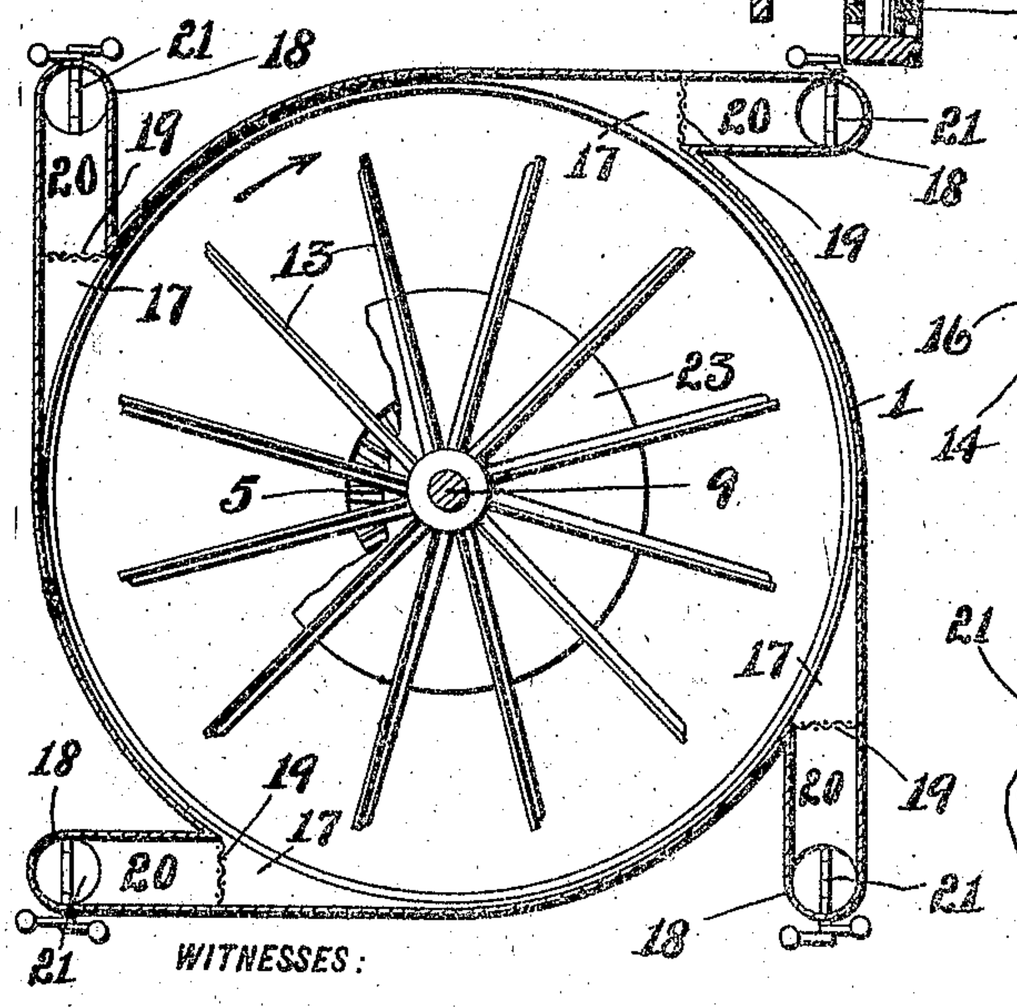
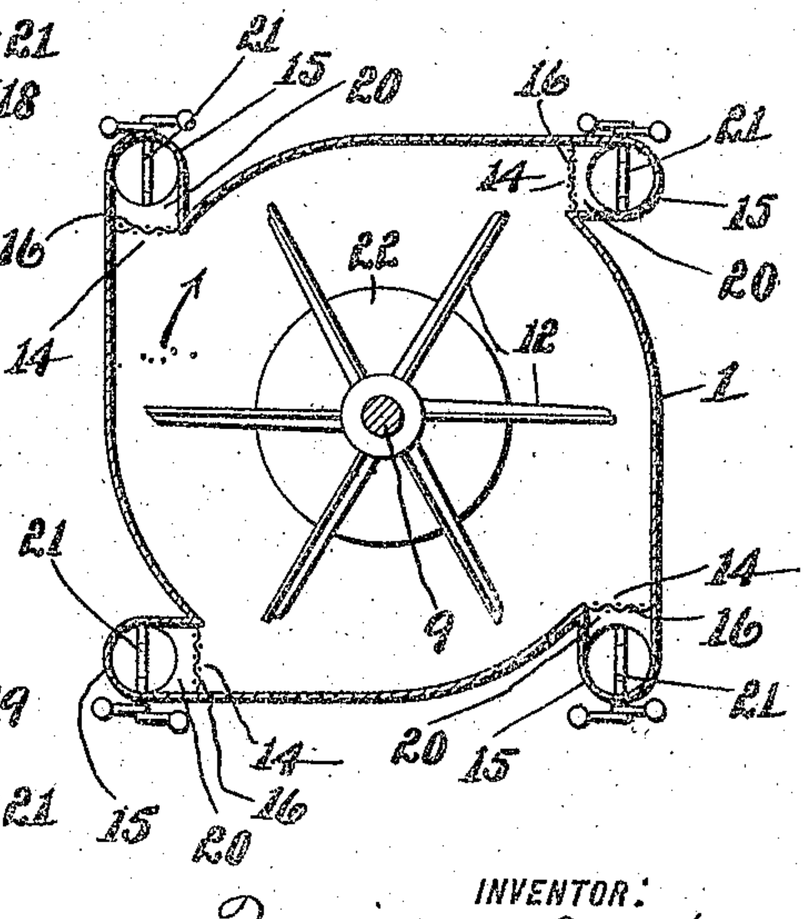


Fig. 3.



WITNESSES:

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GAS-PURIFIER.

No. 815,674. Specification of Letters Patent. Patented March 20, 1906.

Application filed June 23, 1904. Serial No. 213,814.

To all whom it may concern:

Be it known that I, QUINCY BENT, a citizen of the United States, residing at Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Purifiers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a medial vertical section. Fig. 2 is a full section on line *x x*, Fig. 1. Fig. 3 is a full section on line *y y*, Fig. 1.

The object of this invention is to provide an improved apparatus for separating dust from air or gas, the same being more particularly designed for the extraction of dust from blast-furnace gas.

The precise nature of the invention will appear from the following description in connection with the accompanying drawings.

In said drawings, 1 is the case of the apparatus, which is divided into a lower chamber 2 and an upper chamber 3. There is a central opening 4 in the bottom of chamber 2 and a similar opening 5 in the top thereof, the first opening communicating with an inlet-pipe 6, that leads from the source of the gas to be treated, and the second opening with the chamber 3. The latter has an opening 7 at the top that communicates with an outlet-pipe 8. Extending centrally through the chambers and the said several openings is a rotatable shaft 9, that is adapted to be driven from a source of power. In the present instance this shaft is journaled in a bearing 10 of the outlet-pipe 8 and in a step-bearing 11 of the inlet-pipe 6. Within the chamber 2 is a fan 12, of ordinary construction, which is mounted on the shaft 8 and within the chamber 3, and also mounted on the shaft is a similar fan 13. Extending, preferably tangentially, as shown, from the periphery of the wall of chamber 2 are outlet-openings 14, equidistant and four in number in the present instance, which openings respectively communicate with depending pipes 15. Extending across the entrance of each of said openings from the chamber 2 is a foraminated plate or screen 16. The upper chamber 3 is also provided with openings 17, similar to those of chamber 2, which communicate with depending pipes 18. Screens 19, similar to screens 16, also extend across the entrance into said openings.

The apparatus is supported on a suitable foundation. (Not shown.)

Having thus described my invention, I shall now describe the mode of operation thereof, as follows: Premising that the gas to be treated is forced or drawn through the apparatus by any suitable means, so that if the fans were not running, the current of gas would be direct from the opening 4 through the openings 5 and 7. The shaft 9, being driven at a suitable speed in the direction of the arrow in Fig. 3, the dust-laden gas entering chamber 2 by way of opening 4 is diverted by the fan 12 from its natural direct course and thrown outwardly toward the periphery of said chamber, and at the same time the heavier dust particles thrown to said periphery and not able to return to the center, owing to their weight, escape through the openings 14 into the pipes 15. The gas with the lighter dust particles not removed by this first fan passes onwardly to and escapes through the contracted opening 5 into the chamber 3 and is there acted upon by the fan 13, whereby the dust particles in like manner escape by way of the openings 17 into the pipe 18, and the cleansed gas passes through the opening 7 and out by way of the exit-pipe 8. The upper chamber 3 and the fan 13 are preferably of greater area than the lower chamber 2 and the fan therein, as shown, so that the currents of air in the former will have greater linear velocity than in the latter chamber—that is, sufficient to separate and discharge into the openings 17 the lighter dust particles that have entered chamber 3 from chamber 2. The purpose of the lattices or screens 16 and 19 is to obstruct the openings 14 and 17 sufficiently to cause what may be termed a "dead" current of air in the spaces 20 beyond the lattices. The latter may, however, sometimes be dispensed with.

In order to temporarily retain the dust in the pipes 15 and 18, I sometimes provide a valve 21 in each of said pipes, which valves are adapted to be operated from the outside to open or close or partially open the said pipes, respectively. I also sometimes secure to the hub of the fan 12—that is, to the shaft 9—a horizontal deflecting-disk 22 for the purpose of preventing any direct passage of the gas from the chamber 2—in other words, to assure the throwing out of practically all the gas to and beyond the periphery of the fan before passing up through the opening 5 to chamber 3, and I also sometimes secure a similar disk 23 for a like purpose to the hub of fan 13.

If required, there may be a greater number of similar chambers and fans than that shown in the drawings and sometimes a single chamber and fan will suffice.

While in the form of the invention shown in the drawings the chambers and fans are disposed horizontally, the latter being on a vertical shaft, the shaft may be horizontal and the fans and chambers vertically disposed.

I also remark that while I have termed my apparatus a "gas-washer" it may also be used for extracting dust from air.

Having thus described the construction and manner of use of my invention, I claim as new and desire to secure by Letters Patent—

1. In an apparatus of the character recited, the combination of the casing, the chamber therein having the central contracted inlet and outlet openings and the peripheral openings, the screens in the latter, the rotatable shaft extending through said chamber, and the fan within the latter mounted on said shaft, substantially as set forth.

2. In an apparatus of the character recited, the combination of the casing, the chamber therein having the central contracted inlet and outlet openings, and the peripheral openings, the screens in the latter, the rotatable shaft extending through said chamber, the fan within the latter and mounted on said shaft and the deflecting-disk within said chamber and carried by said shaft, substantially as set forth.

3. In an apparatus of the character recited, the combination of the casing, the two superposed chambers therein one being of greater diameter than the other, each having the peripheral openings, the rotatable shaft substantially concentric with and extending through said chambers, and the fans within the latter respectively and mounted on said shaft, the fan within the upper of said chambers being of greater diameter than the other, there being a central contracted inlet-opening into the first chamber, a similar opening between the first and second chambers and a similar outlet-opening from the latter chamber, substantially as set forth.

4. In an apparatus of the character recited, the combination of the casing, the chamber therein having the central contracted inlet and outlet openings, the rotatable shaft extending through said chamber, the fan within the latter and mounted on said shaft, said chamber having also the peripheral vertical openings extending the height of said chamber and the pipes communicating with said peripheral openings respectively, and the valve within said pipes, substantially as set forth.

In testimony whereof I have hereunto affixed my signature this 28th day of May, A. D. 1904.

QUINCY BENT.

Witnesses:
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