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No. 804,677.

PATENTED NOV. 14, 1905.

A. SAHLIN.
GAS PURIFIER.
APPLICATION FILED MAY 9, 1905.

Fig. 1.

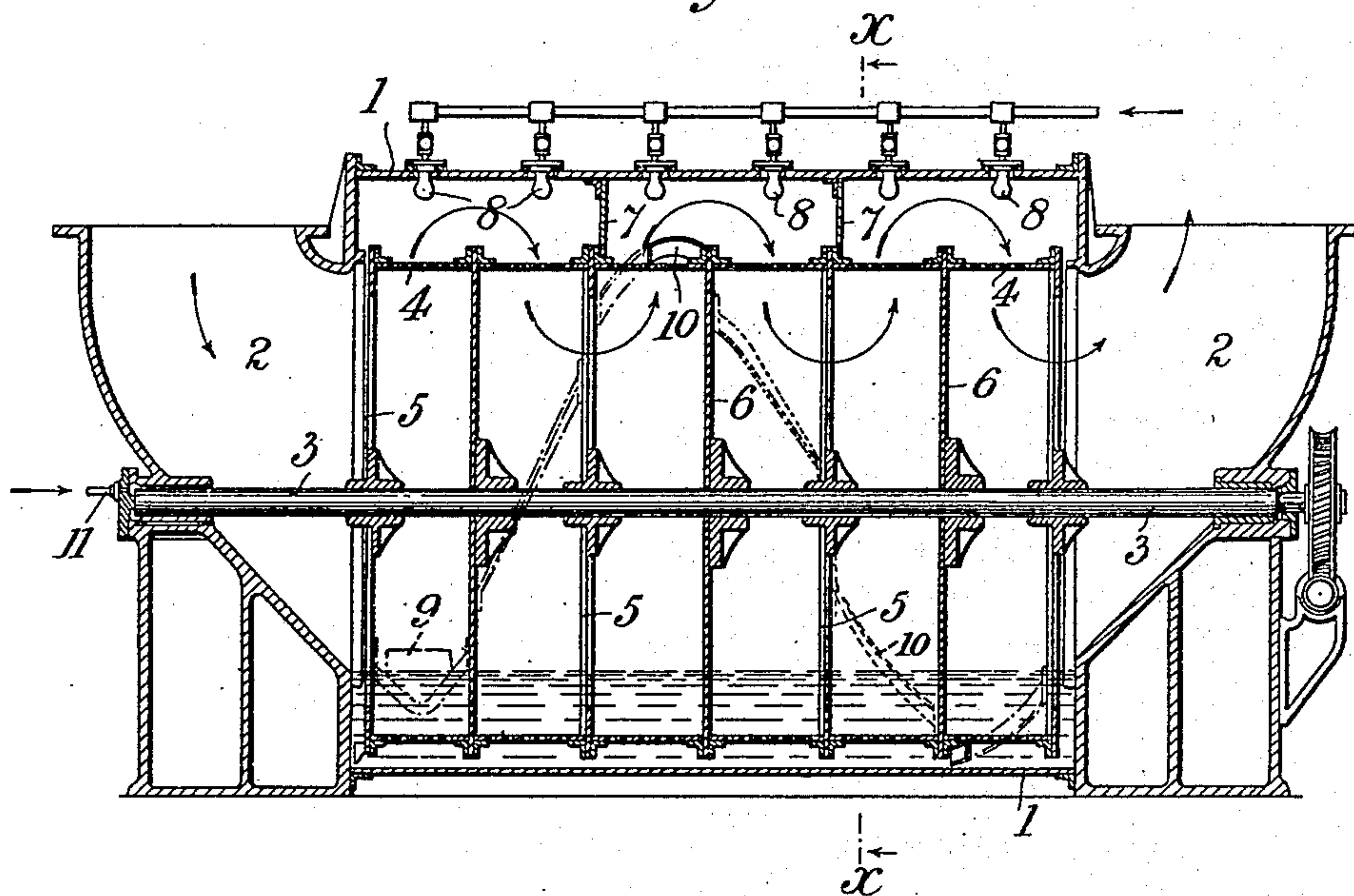
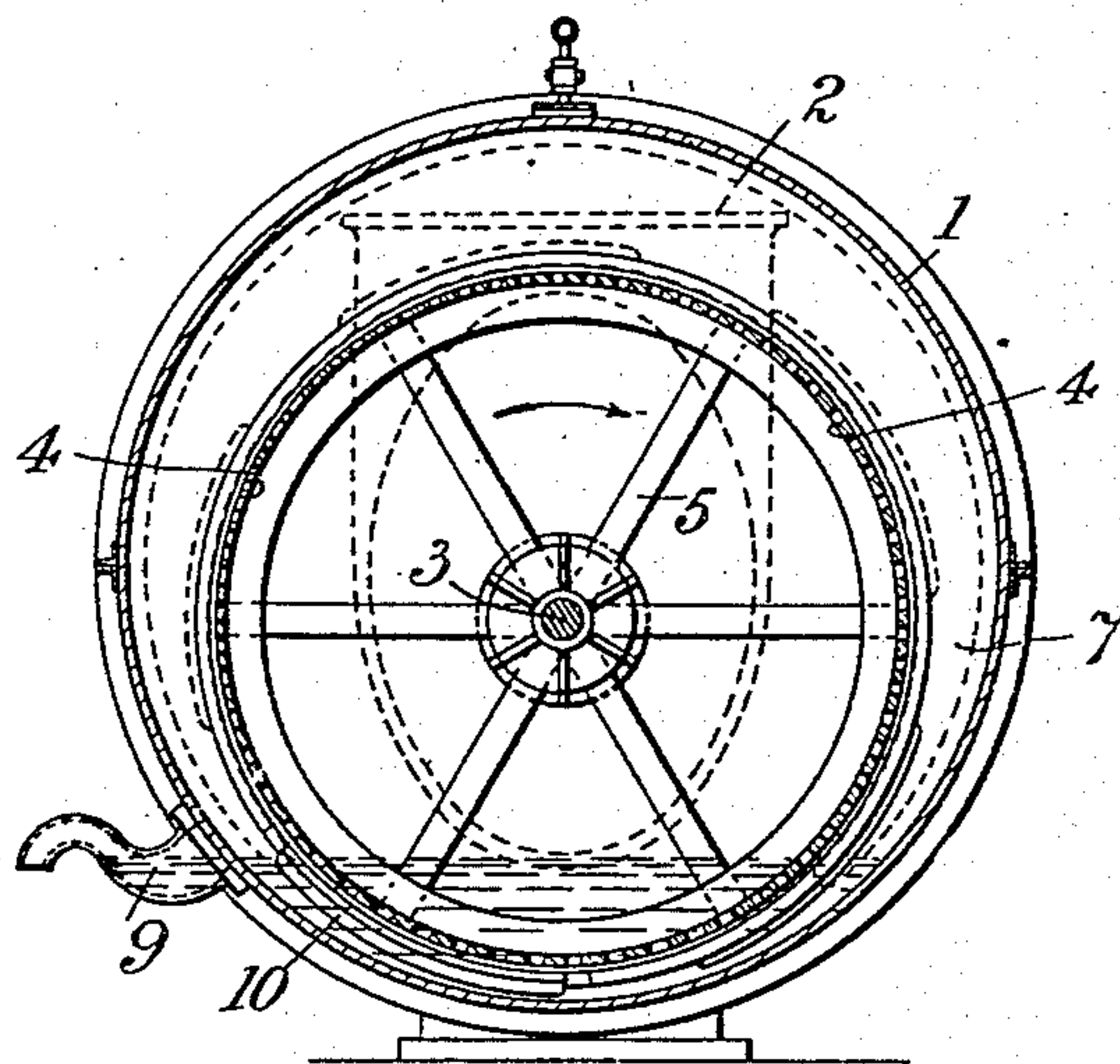


Fig. 2.



WITNESSES.

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UNITED STATES PATENT OFFICE.

AXEL SAHLIN, OF LONDON, ENGLAND.

GAS-PURIFIER.

No. 804,677.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed May 9, 1905. Serial No. 259,605.

To all whom it may concern:

Be it known that I, AXEL SAHLIN, a citizen of the United States of America, residing at London, England, have invented a certain new and useful Improved Means for Cleaning Blast-Furnace and Like Gases, of which the following is a specification.

This invention relates to the cleaning of blast-furnace, coke-oven, producer, and like gases for the purpose of eliminating the dust and fine particles of material therefrom. Various methods for cleaning such gases have heretofore been proposed, among which may be mentioned that in which the gas was passed through a closed cylinder partly filled with water and provided with a central shaft carrying series of perforated diaphragms. As such diaphragms were revolved the perforations would carry up a certain amount of water through which the gases would pass and from which the dust would be eliminated. One of the drawbacks to the use of such an apparatus is that to secure a combined area of the perforations sufficient to deal with a large volume of gas it is necessary to employ diaphragms of large diameter, and this makes the apparatus heavy and expensive.

By the use of the present invention a large volume of gas can be dealt with in a comparatively small apparatus, and this end is secured by an improved construction and arrangement of parts, as indicated in the accompanying drawings, in which—

Figure 1 is a sectional elevation, and Fig. 2, a cross-section on line *xx*, Fig. 1, of apparatus constructed according to this invention.

In the drawings, 1 indicates a stationary horizontal cylindrical shell, in the ends of which are openings 2 for admission and discharge of the gas. The shell may be conveniently built in an upper and a lower half, joined in the horizontal diametrical plane, as indicated in Fig. 2. Parallel with the axis of this shell, but somewhat below the center of the same, is placed a revolving axle 3, running in bearings supported by the ends of the shell. This axle carries a cylindrical perforated or gauze drum 4, which is attached to the axle at different points by means of radial spokes 5, between the sets of which are solid disks 6. The size of the perforations or mesh of the gauze of the drum 4 varies in size according to the condition of the gas to be cleaned. It may be well to make the apertures at one end of the drum larger than those at the other end, or it may be better to make

all the openings of the same size. Corresponding with and in the plane of the spokes 5, which attach the revolving drum to the shaft, and outside of the same are placed diaphragms 7, which practically, except at the bottom part of the shell, close the space between the outer shell and the revolving drum. The surface of the revolving drum is thus divided into short cylindrical sections, in each of which the area of perforations should be somewhat larger than the area of the pipe admitting the gas.

Above the drum are placed a series of water-jets 8, adapted to play against the drum and the gas as it passes therethrough. The bottom of the cylinder also contains water, the level of which above the lower part of the drum is determined by a trapped outlet 9, preferably placed near the inlet end of the cylinder, so that it may also form the discharge for the collected dust which may be carried thereto by one or more blades 10, spirally arranged around the drum and coming in comparatively close contact with the bottom of the cylinder, or, if preferred, the bottom of such cylinder may be of V or U shape and be separately provided with a screw or other conveyer. To prevent the bearings of the shaft 3 being unduly heated at the inlet end, such bearings may be made of wood or other material, which may be grooved or loosely applied, so that water may be injected through 11 into them and to the drum, or, if desired, the shaft 3 may be made hollow and provided with perforations inside the drum, so that the gas may be sprayed therein as well as when passing therethrough.

With the construction indicated the operation would be as follows: The gas passing into the drum from the inlet-pipe 2 would enter into the first section of the drum. The first disk 6 prevents it from advancing, and it is forced through the perforations in the drum into the space between the outer shell and the revolving drum. In this space the progress of the gas is blocked by the first diaphragm 7, and it is forced to return again through the perforations into the interior section of the drum, which lies between the first and second disks 6. It is then again forced through the perforations into the space between the first and second diaphragms 7, and so on, passing in and out of the drum any desired number of times. In this operation the gas is subjected to the

the drum 4 and thrown upon it by the sprays 8, and each time it passes through the perforations its direction must change one hundred and eighty degrees, and during this change every particle of gas is passing through a spray of water, and while this thorough cleansing of the gas is taking place the dust washed therefrom and from the drum is being automatically discharged from the screw conveyor 10.

Where the delivery-pressure of the gas is normally low, it may be increased by the use of a blast or exhaust in the well-known manner.

15 What I claim is—

1. An apparatus for cleaning blast-furnace and other gases comprising an outer stationary shell having inlet and outlet openings therein, a revoluble perforated drum within said shell, disks arranged within said drum transversely of its axis and dividing said drum into compartments, means carried by the shell and cooperating with said disks to form compartments in the shell for changing the direction of the gases whereby they are caused to pass in and out from one compartment to the other of said drum through its perforated surface, and means above each compartment for subjecting said perforated surface to the action of water.

2. An apparatus for cleaning blast-furnace and other gases comprising an outer stationary shell having inlet and outlet openings therein, a revoluble perforated drum within said outer shell, disks arranged within said drum transversely of its axis and dividing said drum into compartments, diaphragms arranged between the shell and the drum to form compartments in said shell whereby the direction of the gas is changed as it passes from one compartment to another, and means located in the upper part of each compartment of the shell for admitting water within the latter and upon the drum to act upon the gases during their passage through the apparatus.

3. An apparatus for cleaning blast-furnace and other gases comprising an outer shell provided with inlet and outlet openings, a revoluble perforated drum within said outer shell,

disks arranged within said drum dividing the latter into compartments, diaphragms so arranged between the shell and the drum and forming compartments in the former, that the direction of the passing gas is changed one hundred and eighty degrees, a supply-pipe having nozzles for admitting water within each compartment of the shell and the drum to act upon the passing gas, and blades spirally arranged upon the outer periphery of the drum to convey the used water and dust to the discharge-exit.

4. An apparatus for cleaning blast-furnace and other gases comprising an outer stationary shell having inlet and outlet openings therein, a revoluble drum within said shell having perforations on its periphery, disks located within said drum transversely of its axis and dividing said drum into compartments, diaphragms alternating with said disks and carried by said shell to form compartments in the latter and cooperating with said disks to change the direction of the gases as they pass from one compartment to another and means above each compartment for subjecting the gases passing therethrough to the action of water.

5. An apparatus for cleaning blast-furnace and other gases comprising an outer stationary shell having inlet and outlet openings therein, a revoluble drum located within said shell eccentrically to the axis thereof and having perforations on its periphery, disks located within said drum transversely of its axis and dividing said drum into compartments, diaphragms alternating with said disks and carried by said shell to form compartments in the upper part of the latter and cooperating with said disks to change the direction of the gases as they pass from one section to another, and means above each compartment for subjecting the passing gases to the action of water.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

AXEL SAHLIN.

Witnesses:

F. HUNTER,

ARTHUR H. ALFORD.