June 13, 1933. H. J. KERR 1,913,676

DEVICE FOR DISTRIBUTING MATERIALS INTO BRANCH CONDUITS

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Fig. 1

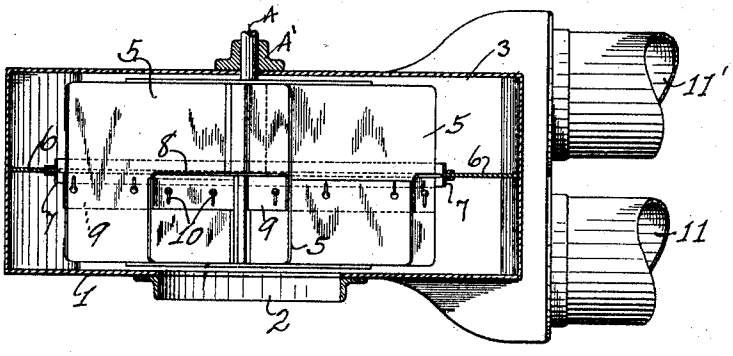


Fig. 3a

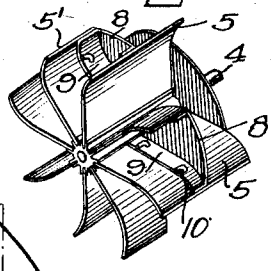


Fig. 2

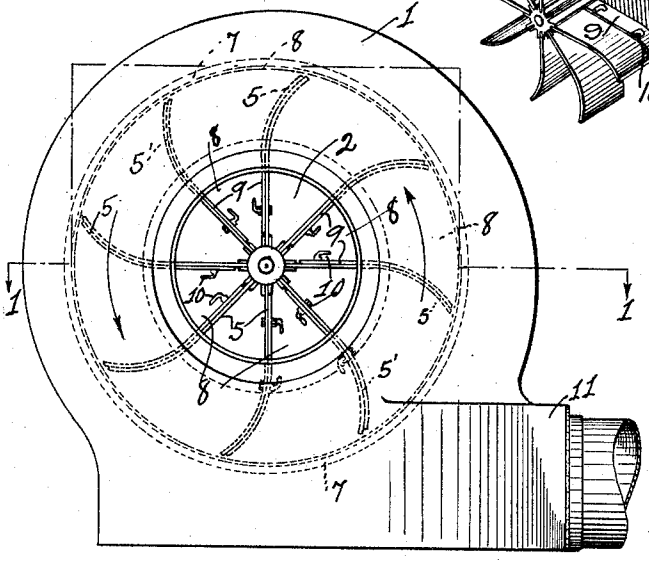
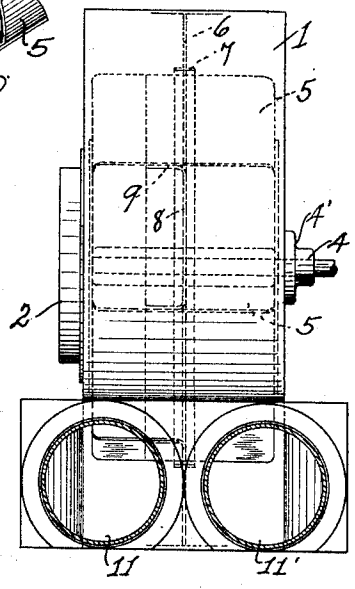


Fig. 3



INVENTOR

Howard J. Kerr

BY

Gifford & Scull

ATTORNEYS

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DEVICE FOR DISTRIBUTING MATERIALS INTO BRANCH CONDUITS

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Fig-4

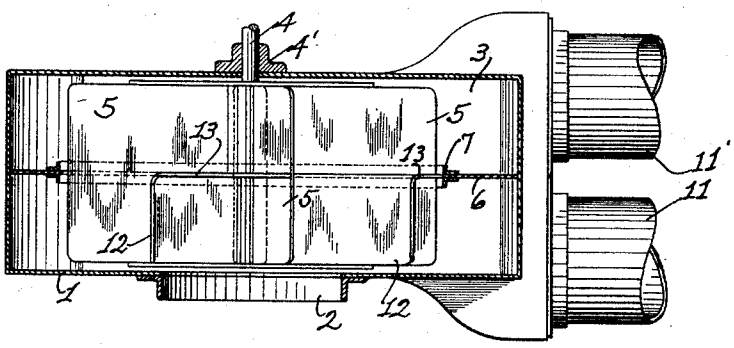


Fig-5

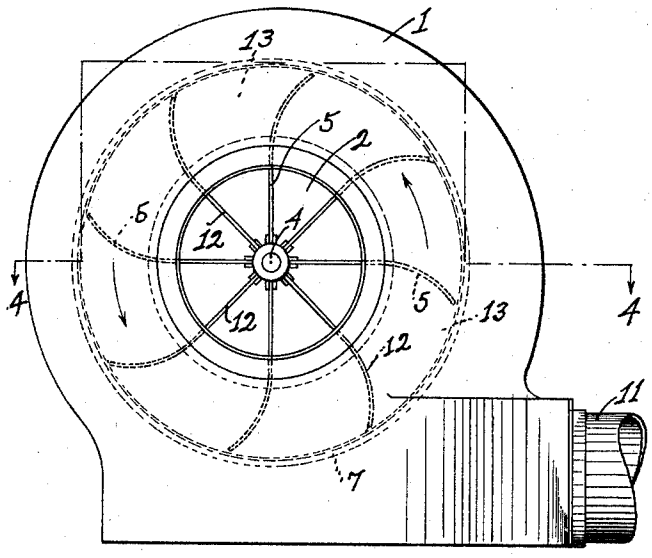
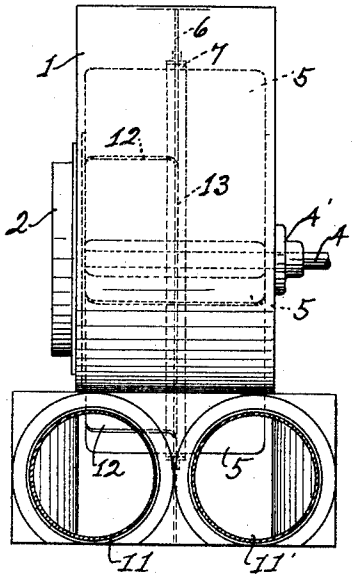


Fig-6



INVENTOR
Howard J. Kerr
BY
Gifford & Scull
ATTORNEYS

Patented June 13, 1933 1,913,676

UNITED STATES PATENT OFFICE

HOWARD J. KERR, OF WESTFIELD, NEW JERSEY, ASSIGNOR TO FULLER LEHIGH COMPANY, OF FULLERTON, PENNSYLVANIA, A CORPORATION OF DELAWARE

DEVICE FOR DISTRIBUTING MATERIALS INTO BRANCH CONDUITS

Application filed April 28, 1928. Serial No. 273,541.

This invention relates to a device by which fine particles of material or powder, that are carried by a stream of air or gas through a conduit may be divided in such a manner that equal proportions of air and solid material are passed into the respective branches. It is well known that when powdered coal, for example, is carried by air through a conduit the coal sometimes becomes concentrated along one side of the conduit so that if a branch is tapped off from that side the proportion of coal to the air is greater than in the main conduit making that in the branch too rich in coal, while a branch tapped off from another portion would be too lean in coal. By the present invention this objection can be avoided and the proper distribution of coal in the air in the different branches is obtained. The invention will be understood from the description in connection with the accompanying drawings in which Fig. 1 is a section of an illustrative embodiment of the invention taken along the line 1—1 of Fig. 2; Fig. 2 is a side elevation of the device; Fig. 3 is an end view of the same; Fig. 3ª is a perspective view of some of the parts on a small scale; Fig. 4 is a section similar to Fig. 1 taken along the line 4—4 of Fig. 5 showing a modification; Fig. 5 is a side view of the modification; and Fig. 6 is an end view of the same.

In the drawings reference character 1 indicates a casing that is provided with an inlet 2 on the side which leads from a conduit from which branches are provided. The casing 1 contains a cylindically shaped propeller compartment 3 in which a propeller is mounted comprising the propeller shaft 4 that is journaled in the bearing 4′ on the casing, and axially disposed blades 5 that are preferably slightly curved extending from the shaft 4 in radial directions. The blades comprise two groups 5 and 5′, the group 5 being substantially as wide as the axial dimension of the compartment 3 and the group 5′ being approximately half that width. The blades 5 and 5′ alternate with each other around the propeller wheel. The shaft 4 may be driven from any convenient source of power (not shown) so that the propeller, which is in fact a revoluble wheel, can be driven at any desired speed.

A division plate 6 is located about half way between the ends of the cylindrical compartment 3 and is provided with ring shaped angles 7 that are attached to the plate 6, the inner flanges terminating near the outer periphery of the blades 5 and 5′. Somewhat triangularly shaped baffles 8 are installed at the inner edges of the blades 5′ these baffles closing the alternate spaces between the blades 5 and 5′ and being perpendicular to these blades. The baffles 8 have flanges 9 parallel to the blades 5 extending toward the inlet 2 and clamping screws 10 are provided on the blades 5 and 5′ passing through slots in the flanges 9 so that the baffles 8 can be adjusted axially on the blades 5′ and 5. The combined width of the inner flanges of the angles 7 is sufficient to suit the different positions of the baffles 8 and to cover the range of adjustment of these baffles. A pair of outlets 11 and 11′ extend from the lower side of the casing 1, being disposed on the opposite sides of the division plate 6. By making the baffles 8 adjustable, means are provided for diverting different amounts of material into the different outlets 11, 11′.

The operation is as follows: The gas or air carrying the particles of solid material in suspension enters through the inlet 2 while the shaft 4 and blades 5 and 5′ are being driven. A portion of the air and solid particles enters the spaces between the blades 5 and 5′ that are closed by the baffles 8 and passes into the conduit 11 while the other portion of the air and solid particles passes through the other spaces and thence into the conduit 11′. If the entrances to the spaces between the blades 5 and 5′ are of the same sizes, substantially equal amounts of the material will be carried into the respective branches 11 and 11′. However, by making the sets of entrances of different sizes, different amounts of material can be diverted into the respective branches. In view of the face that each opening between the blade 5 and blade 5′ sweeps over the entire area of the inlet 2, the average concentration of solid material in the air will be the same for each

opening, and therefore the proper proportion of air to solid material will be carried off by the branches 11 and 11'.

In the modification shown in Figs. 4, 5 and 6, the blades 5' and baffles 8 are dispensed with and the blades 12 that alternate with the blades 5 are bent near the middle and the bent ends 13 are turned and shaped so as to come into contact with the blades 5 at right angles thereto, thus closing the alternate ends of the spaces between the blades 5 and 12. The operation is similar to that above described in connection with the other modification.

I claim:

1. In a device of the character described, a casing, a wheel having radial blades thereon revoluble in said casing, baffles on said wheel extending between alternate pairs of blades, and a division plate attached to the inside of said casing substantially in alignment with said baffles.

2. In a device of the character described, a casing, a revoluble wheel having blades located in said casing, and baffles between alternate pairs of blades, said baffles being attached to said blades and adjustable axially of said wheel on the same.

3. In a device of the character described, a casing, a revoluble wheel having blades located in said casing, baffles between alternate pairs of blades attached to both blades, and outlets from said casing on opposite sides of said baffles.

4. In a device of the character described, a cylindrical casing, an inlet in one end of said casing, outlets at the circumference of said casing, revoluble blades in said casing, and baffles between some of said blades intermediate said outlets, said baffles being carried by said blades.

5. In a device of the character described, a casing, a revoluble shaft in said casing, radially extending blades connected to said shaft, and adjustable baffles disposed at an angle to said blades and revoluble therewith.

6. In a device of the character described, a casing, a revoluble wheel in said casing, blades carried by said wheel, and adjustable baffles between alternate pairs of blades extending in a plane substantially at right angles to the axis of said wheel.

7. In a device of the character described, a casing, a revoluble wheel in said casing, blades carried by said wheel, and baffles adjustable axially of said wheel between alternate pairs of blades extending in a plane substantially at right angles to the axis of said wheel.

8. In a distributor, a casing, two outlets from said casing, a revoluble wheel in said casing, blades on said wheel, and baffles between alternate pairs of blades extending substantially in a plane of motion of a point on one of said blades for controlling distribution between said two outlets of material entering the distributor.

9. In a distributor, a casing, a wheel in said casing, an inlet to said casing, and a plurality of outlets from said casing, in combination with baffle means on said wheel for diverting different amounts of material into the different outlets.

10. In a distributor, a substantially cylindrical casing, a wheel in said casing, an inlet to said casing, and a plurality of parallel outlets to said casing, said outlets being tangential to said casing and to said wheel, in combination with baffle means on said wheel for diverting different amounts of material into the different outlets.

11. Apparatus for distributing pulverized material transported in suspension in a gas stream comprising a casing having a material inlet arranged in one side thereof and a plurality of material outlets arranged in the periphery thereof and opening to said casing at different axial distances from said inlet, a rotary distributor wheel in said casing in axial alignment with said inlet, said wheel having angularly spaced axially extending blades mounted thereon and dividing the interior of said casing into a series of segmental chambers, baffle plates on said wheel extending between spaced pairs of adjacent blades and arranged to divide said series into a plurality of groups of chambers of different axial depths, and each of said groups of chambers being arranged to discharge into but one of said peripheral outlets.

HOWARD J. KERR.