Dec. 6, 1932. W. A. WHITE 1,889,816

DISTRIBUTOR

Filed Oct. 21, 1931 2 Sheets-Sheet 1

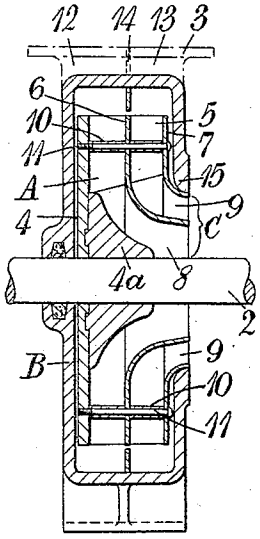


Fig. 1.

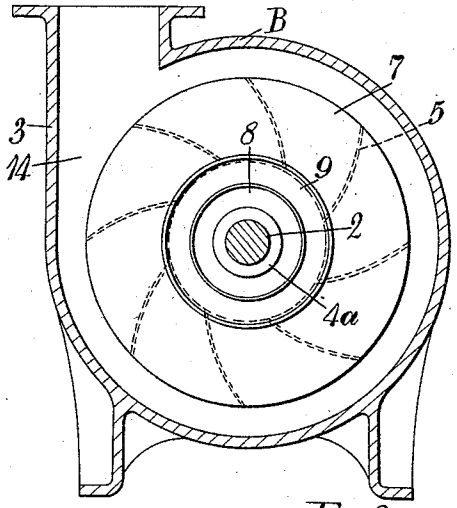


Fig. 2.

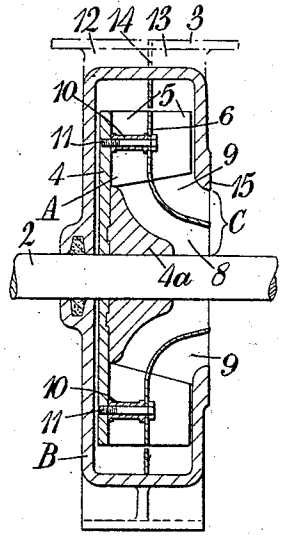


Fig. 3.

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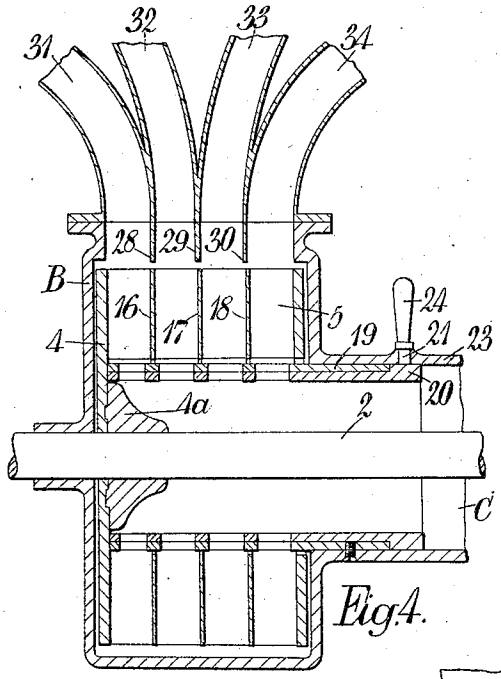


Fig.4.

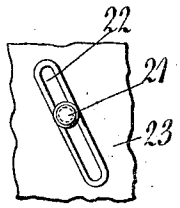


Fig.5.

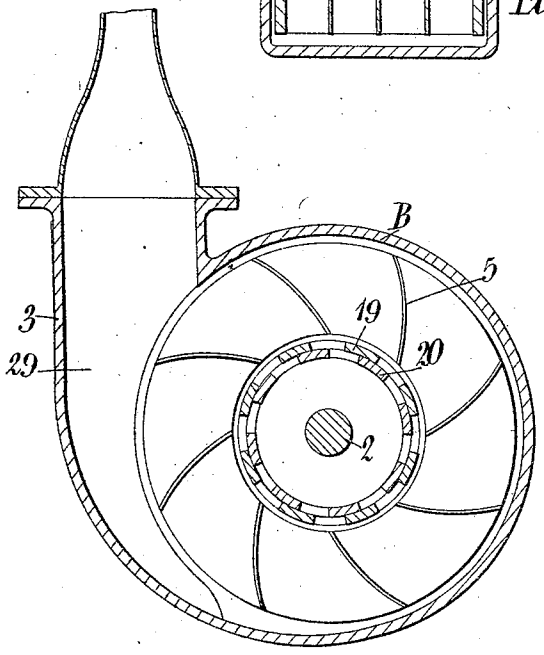


Fig.6.

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UNITED STATES PATENT OFFICE

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DISTRIBUTOR

Application filed October 21, 1931, Serial No. 570,233, and in Great Britain October 30, 1930.

The invention relates to distributors and is applicable to the distribution of solids in a discrete, e. g., granular or pulverized form, of liquids or even of gases.

For example, in pulverized-coal installations, it is often necessary to distribute the coal from a single pulverizer among a number of different burners and a main object of the present invention is to provide a form of apparatus suitable for this purpose.

With such an object, the invention consists in a distributor for the purpose indicated comprising the combination of elements described and particularly pointed out in the claims.

Referring to the accompanying diagrammatic drawings;

Figure 1 shows a sectional elevation of one form of the invention having two trumpet-mouthed members,

Figure 2 being a corresponding sectional end view;

Figure 3 shows a sectional elevation of a modified form having only one trumpet-mouthed member;

Figure 4 shows a sectional elevation of another form of the invention having an internal cylindrical valve,

Figure 5 being a detail view of the inclined slot; while finally

Figure 6 shows a sectional end view corresponding to Figure 4.

When desirable, the same reference symbols are used in the different figures to denote corresponding parts.

In carrying the invention into effect according to the form shown in Figures 1 and 2 applied to pulverized coal, the distributor comprises a fan or impeller member, A, hereinafter called the "rotor," mounted rotatably within a casing, B, the pulverized coal passing in an axial direction to the inside of the casing through an annular passage, C, in proximity to and surrounding the shaft, 2, of the rotor, and passing out of the casing by way of a tangentially-disposed delivery duct, 3. (Figure 2.)

The casing is preferably formed in halves which may be hinged together, if desired, so as to provide ready access to its interior.

The rotor itself comprises a plate or shroud, 4, secured at right angles to the shaft, 2, and disposed towards the side of the casing remote from the inlet, (see Figure 1) while a hub or the like, which in effect takes the form of an annular fillet, 4*a*, of quadrantal shape, is provided in the angle on the inlet side between the plate, 4, and the shaft, 2.

The blades or beaters, 5, which are preferably renewable, project from the plate at right angles near its periphery, and may be plane or curved as desired.

To secure the distribution required, the rotor also embodies, in the form of the invention under description, two or more spaced sheet metal partitions, 6, 7, pressed or stamped to the form more or less of a trumpet-mouth and nested co-axially one within the other with their curved inlet of small diameter facing axially in the direction from which the pulverized fuel reaches them and their circumferential parts extending substantially in planes at right angles to the axis of rotation, so that the path of any individual particle of the pulverized coal on its passage through the rotor is deflected substantially through a right angle.

By help of the partitions, 6, 7, and the hub, 4*a*, above mentioned, two ducts, 8, 9, are formed through the rotor, each of these ducts being axial at its inlet and radially disposed at its outlet.

The actual constructional features of the rotor may take different forms.

Thus, the blades, 5, themselves may be riveted between the side plate, 4, and the partitions, 6, 7, while if desired extra strength may be provided by way of distance pieces, 10, and studs, 11, screwed into the side plate, 4. (See Figure 1.)

The delivery duct, 3, is divided into two ducts, 12, 13, to correspond with the rotor ducts, 8, 9, the dividing septum, 14, between the two ducts being aligned with the partition, 6, of the rotor.

According to a modification of the form of the invention described as shown in Figure 3, only the partition, 6, is provided, the limiting wall of the casing, B, and in par-

ticular its rounded part, 15, taking the place of the partition, 7, previously described.

In accordance with another form of the invention, (see Figures 4 and 5) the curved parts of the trumpet-shaped partitions are omitted and only the outer plane parts, 16, 17, 18, associated with the blades of the rotor are retained.

In this form of the invention, in order that the incoming pulverized coal may be properly distributed among the ducts through the rotor, a ported cylinder, 19, fixed to the casing, B, is arranged within the blades, 5, and co-axial with their axis of rotation, a similarly ported sleeve, 20, being so mounted within and in operative juxtaposition to the cylinder, 19, that it may be rotated and slid axially in relation thereto.

In order to prevent jamming by the pulverized coal, the sleeve, 20, is preferably so arranged that a screw movement, that is a movement both circumferential and axial, may be given to it and with this object a pin, 21, fixed to the sleeve passes through an inclined slot, 22, (see Figure 5) in the inlet branch, 23, to the casing or other suitable part, a controlling handle, 24, fixed to or forming part of the pin, 21, being operable from outside.

In this form of the invention, three partitions, 28, 29, 30, are provided in the delivery duct, 3, so as to deliver the pulverized coal to four ducts, 31, 32, 33 and 34.

Alternatively, the ports in the cylinder, 19, and sleeve, 20, instead of registering in the fully open position, may be arranged in staggered or other relation, or a number of sleeves one within the other may be used, so that the openings to the several passages through the rotor may be adjustable relatively or controllable separately as described.

In any form of the invention, the pipe from the pulverizer itself to the inlet of the distributor may itself be divided by annular or other partitions corresponding with the inlets of the distributing ducts of the rotor.

Valves or dampers may be provided as required in either the inlet passages to the distributor or to the outlet passages therefrom to adjust the flow.

Other variations may be made in the constructional features described above without exceeding the scope of the invention.

I am aware that centrifugal devices have been proposed in which the rotatable impeller or the like was divided into separate ducts by one or more partitions but such impellers either received from and discharged into common ducts or received from and discharged into separate unconnected ducts, so that no distribution of material was effected.

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

1. A distributor of the kind indicated, comprising in combination a casing having a common central inlet and a plurality of peripheral deliveries therefrom, a rotatable blower element mounted within said casing and partition means also within said casing and defining a plurality of paths through said blower, all said paths issuing from said common central inlet and leading to said plurality of peripheral deliveries.

2. A distributor as claimed in claim 1, in which said common inlet is disposed axially of said blower with said partition means disposed edgewise of the axial direction of flow through said inlet.

3. A distributor as claimed in claim 1, in which an annular peripheral space is provided between said casing and said blower, said partition means being disposed in alinement partly within said blower and partly within said peripheral space.

4. A distributor as claimed in claim 1, in which the shape of said partition means is that of a trumpet-mouth arranged co-axially with the axis of rotation of said blower.

5. A distributor as claimed in claim 1, in which said blower element has transversely disposed blades and at least one side plate, said blades and said partition means being secured to said side plate and rotating therewith.

6. A distributor as claimed in claim 1, in which said blower is mounted on a shaft and said central inlet is disposed on one side of said casing axially of said shaft, said blower comprising a side plate on the side thereof remote from said inlet and an annular quadrantal fillet disposed in the angle between said side plate and said shaft.

7. A distributor as claimed in claim 1, in which said partition means within said casing are annular in form and radially disposed and said common central inlet extends axially across the inner peripheries of said partition means.

8. A distributor as claimed in claim 1, in which said partition means within said casing are annular in form and radially disposed and said common central inlet extends axially across the inner peripheries of said partition means and comprising in addition a movable cylindrical ported valve controlling the inlets to said paths between said partition means and a stationary ported sleeve with which said valve co-operates.

9. A distributor as claimed in claim 1, in which said partition means within said casing are annular in form and radially disposed and said common central inlet extends axially across the inner peripheries of said partition means and comprising in addition a movable cylindrical ported valve controlling the inlets to said paths between said par-

tition means, a stationary ported sleeve with which said valve co-operates and means for constraining said ported valve to move both axially and circumferentially.

In testimony whereof I have signed my name to this specification.

WILLIAM ALBERT WHITE.