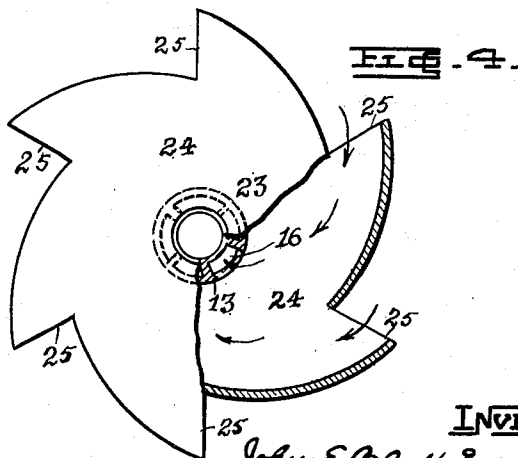
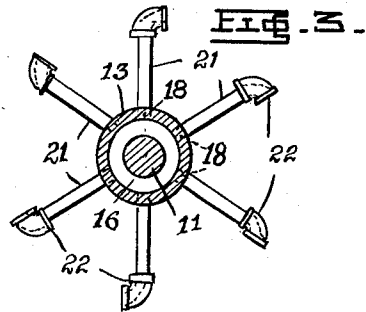
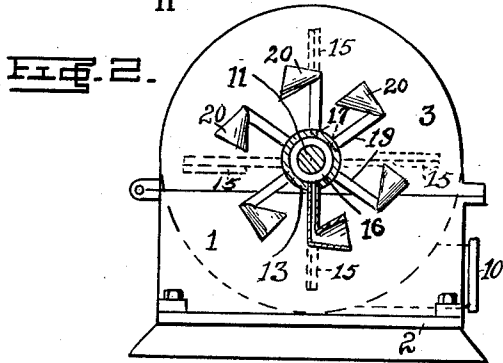
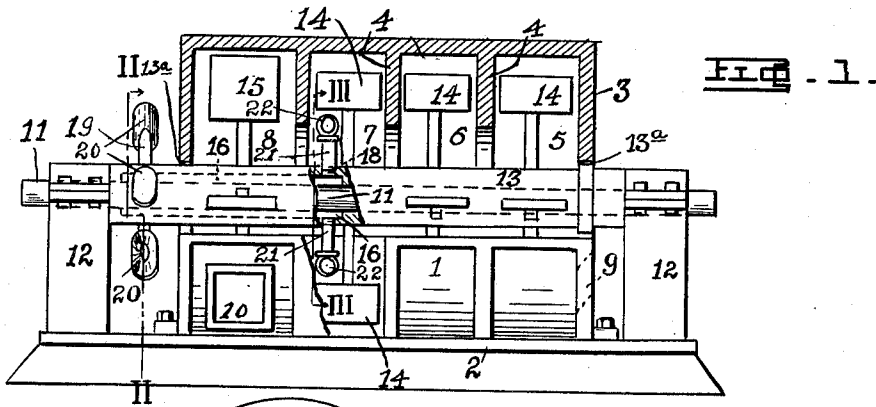


J. E. & H. H. BLAKE.
PULVERIZER.
APPLICATION FILED MAR. 9, 1911.

1,007,913.

Patented Nov. 7, 1911.



WITNESSES:

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TO BLAKE CRUSHER AND PULVERIZER COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PULVERIZER.

1,007,913.

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To all whom it may concern:

Be it known that we, JOHN E. BLAKE and HENRY H. BLAKE, citizens of the United States, and residing in the city of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Pulverizers, of which the following is a specification.

Our invention consists in new and improved means for introducing air into the interior of a pulverizer or machine for reducing coal, coke or other fuel into a fine powder and injecting the same into a combustion chamber.

More particularly our invention relates to the introduction of an auxiliary supply of air, in addition to or distinct from the air which enters with the fuel supplied to the machine. This auxiliary supply of air may be introduced at any point in the pulverizer but in applying our invention to service we prefer to introduce said supply and mingle the same intimately with the fuel before said fuel reaches the fan or ejection chamber and after the operation of pulverizing has been at least partially completed, thus adding to the powdered fuel sufficient air or oxygen for perfect combustion.

Means are shown for promoting the entrance of air into the pulverizer, whereby the rotation of the main shaft draws in the air and thoroughly mingles it with the fuel.

Novel arrangements and construction of parts will appear from the following description.

In the accompanying drawings, which illustrate the practical embodiment of our invention, Figure 1 is a side elevation partially broken away in section to show the construction; Fig. 2 is an end view taken along the line II—II in Fig. 1; Fig. 3 is an enlarged detail along the line III—III in Fig. 1, and Fig. 4 is a view, similar to Fig. 2, of a modification shown partially in section.

The following is a description of the accompanying drawings.

1 is the cylindrical casing for the pulverizing mechanism supported upon a suitable bedplate 2. The upper portion of the casing is in the form of a hinged cover 3 for the purpose of access to the interior.

4—4 are radial, annular partitions which

divide the interior of casing 1 into a series of chambers 5, 6 and 7 in which the fuel is to be pulverized, and a fan chamber 8.

9 is the fuel entrance port leading into chamber 5 and 10 is the exit port in the wall of fan chamber 8 by means of which the powdered fuel is ejected from the machine.

11 is a power driven shaft extending through the pulverizer and journaled at its ends in standards 12—12.

13 is a sleeve rigidly mounted on shaft 11 extending through snugly fitting holes 13^a—13^a in the ends of the casing 1. The central openings of the partitions 4—4 are of sufficient diameter to provide annular ports about the sleeve 13 between the chambers 5, 6, 7 and 8.

14—14 represent the radial paddles mounted on sleeve 13 in chamber 5, 6 and 7, and in fan chamber 8 fan blades 15—15 are also mounted on said sleeve 13. The central bore of sleeve 13 is enlarged for a portion of its length to form between said sleeve and the shaft 11 an annular chamber 16 which extends within the pulverizer from without. Outside of the casing 1 a series of radial ports 17—17 lead through the wall of sleeve 13 into said chamber 16, and 18—18 represent similar ports leading through the wall of sleeve 13 from the chamber 16 into the interior of the casing 1. In the drawings we have shown said ports leading into the pulverizing chamber 7. The number of ports in either of said series is optional but we find by experience that about nine ports to a series is satisfactory.

The ports 17—17 are preferably threaded for the attachment of radial tubes 19—19 upon the outer ends of which may be mounted the hoods 20—20 facing in the direction of rotation of shaft 11 so that air is forced down said tubes 19—19 into the chamber 16. The ports 18—18 are also preferably threaded for the attachment of radial tubes 21—21 which are provided with trailing mouth pieces 22—22, preferably outwardly flaring, so that a partial vacuum is formed behind said mouth pieces which aids in drawing the air from chamber 16 into the interior of the pulverizer. The tubes 21—21 are preferably of suitable length to admit the air in the track of paddles 14—14.

In Fig. 4 we show a modification wherein

a circular body 23 is substituted for tubes 19—19 and hoods 20—20. The body 23 is mounted on the sleeve 13 without the casing 1 and is provided on its perimeter with
 5 radial ports 25—25 facing in the direction of rotation and closed sides 24—24. 26 represents ports leading through the wall of sleeve 13 and connecting the body 23 with the chamber 16.

10 The operation of our invention is as follows. The air forced into the chamber 16 from without is drawn into the chamber 7 and thoroughly mingled with the powdered fuel, each particle of fuel being in effect
 15 enveloped in oxygen and thus prepared for complete combustion. We find this auxiliary air supply a very important feature in pulverizer construction and operation as it eliminates smoke and reduces the ash to a
 20 minimum.

What we desire to claim is—

1. In a rotary pulverizer consisting of a casing containing a pulverizing chamber and a fan chamber, a power shaft extending
 25 axially through said casing and provided with an air passage leading into said casing from without, pulverizing paddles mounted on said shaft within said pulverizing chamber, fan blades mounted on said shaft with-
 30 in said fan chamber, and means mounted on said shaft within said casing whereby the rotation of said shaft draws air through said passage into said pulverizing chamber.

2. In a rotary pulverizer consisting of a
 35 casing containing a pulverizing chamber and a fan chamber, a power shaft extending axially through said casing and provided with an air passage leading into said casing from without, pulverizing paddles mounted
 40 on said shaft within said pulverizing chamber, fan blades mounted on said shaft within said fan chamber, and means mounted on said shaft outside of said casing whereby the rotation of said shaft forces air into said
 45 passage.

3. In a rotary pulverizer consisting of a casing containing a pulverizing chamber and a fan chamber, a power shaft extending
 50 axially through said casing and provided with an air passage leading into said casing from without, pulverizing paddles mounted on said shaft within said pulverizing chamber, fan blades mounted on said shaft with-
 55 in said fan chamber, means mounted on said shaft outside of said casing whereby the rotation of said shaft forces air into said passage, and other means mounted on said shaft within said casing whereby the rota-

tion of said shaft draws air from said passage into said pulverizing chamber. 60

4. In a rotary pulverizer consisting of a casing containing a pulverizing chamber and a fan chamber, a power shaft extending
 65 axially through said casing and provided with an air passage leading into said casing from without, pulverizing paddles mounted on said shaft within said pulverizing chamber, fan blades mounted on said shaft with-
 70 in said fan chamber, and mouth pieces mounted on said shaft within said pulverizing chamber and in communication with said passage, said mouth pieces facing in
 75 the direction opposite to that of the rotation of said shaft, whereby the rotation of said shaft draws air from said passage into said pulverizing chamber.

5. In a rotary pulverizer consisting of a casing containing a pulverizing chamber and a fan chamber, a power shaft extending
 80 axially through said casing and provided with an air passage leading into said casing from without, pulverizing paddles mounted on said shaft within said pulverizing chamber, fan blades mounted on said shaft with-
 85 in said fan chamber, and mouth pieces mounted on said shaft without said casing and communicating with said passage, said mouth pieces facing in the direction of
 90 the rotation of said shaft, whereby the rotation of said shaft forces air through said passage into the interior of said casing.

6. In a rotary pulverizer consisting of a casing containing a pulverizing chamber and a fan chamber, a power shaft extending
 95 axially through said casing and provided with an air passage leading into said casing from without, pulverizing paddles mounted on said shaft within said pulverizing chamber, fan blades mounted on said shaft with-
 100 in said fan chamber, mouth pieces facing in the direction of the rotation of said shaft mounted on said shaft without said casing, and communicating with said passage, and other mouth pieces facing in the opposite
 105 direction mounted on said shaft within said casing and communicating with said passage, whereby the rotation of said shaft causes air to be drawn through said passage into the interior of said casing.

Signed at Pittsburgh, Penna., this 16th
 110 day of February, 1911.

JOHN E. BLAKE.
 HENRY H. BLAKE.

Witnesses:

J. H. HARRISON,
 E. A. LAWRENCE.