No. 661,796. Patented Nov. 13, 1900.

W. M. ERNST.

PULVERIZER.

(Application filed Sept. 23, 1897.)

(No Model.)

Fig. 1.

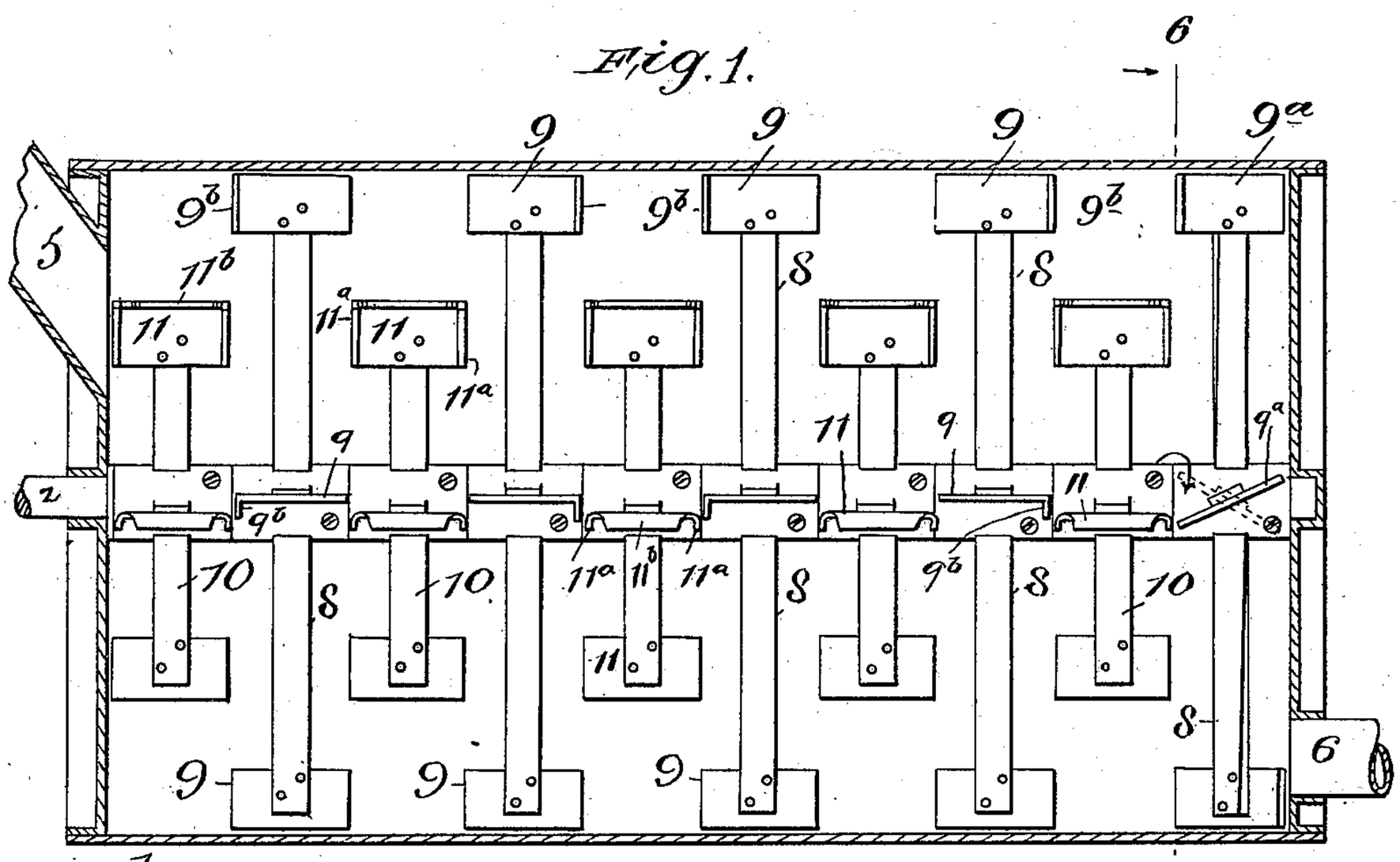


Fig. 4.

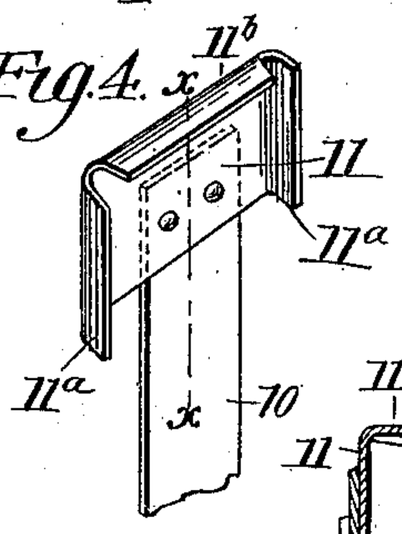


Fig. 5.

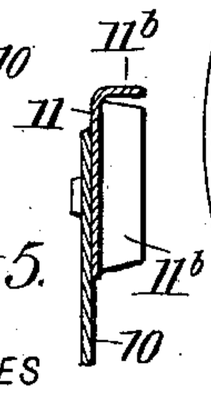


Fig. 2.

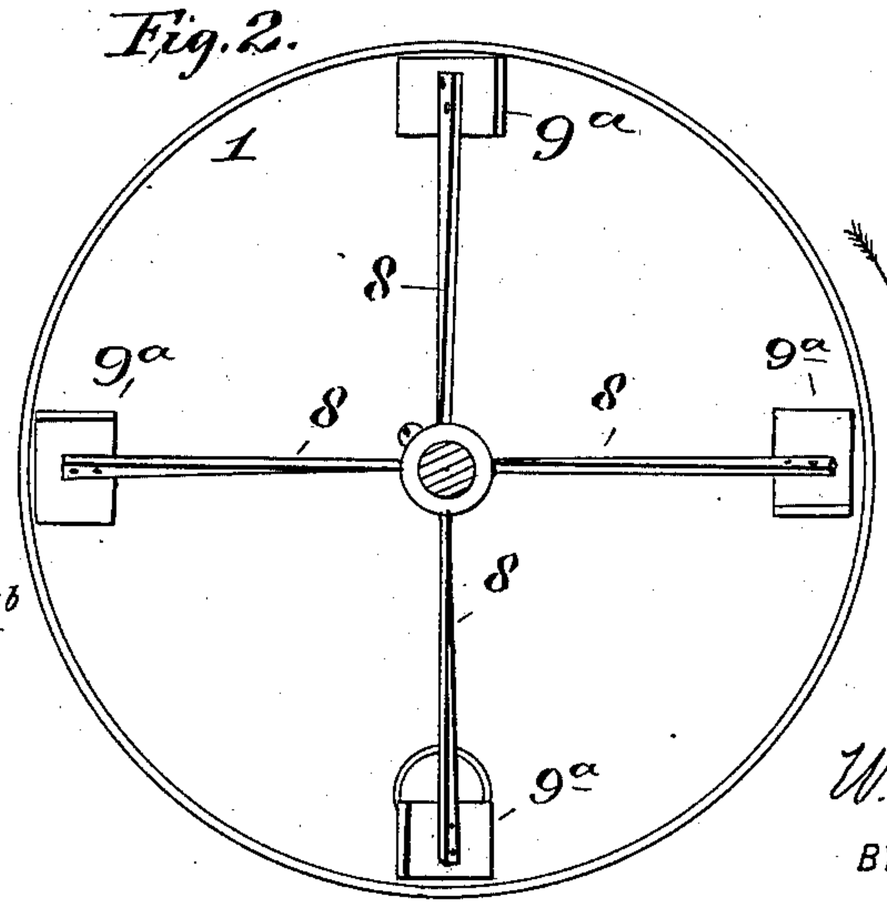
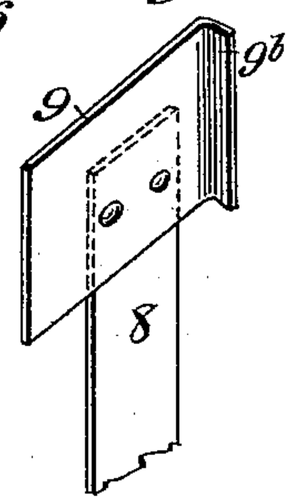


Fig. 3.



WITNESSES

C. N. Benjamin

F. E. Turner

INVENTOR

W. M. Ernst,

BY

T. F. Bourne,

his ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM M. ERNST, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE PHOENIX INVESTMENT COMPANY, OF DELAWARE.

PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 661,796, dated November 13, 1900.

Application filed September 23, 1897. Serial No. 652,721. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. ERNST, a citizen of the United States, residing in New York city, county and State of New York, have invented certain new and useful Improvements in Pulverizers, of which the following is a specification.

My invention relates to improvements in the class of pulverizers wherein a series of rotative bats or beaters are carried within a suitable casing and adapted to engage material to reduce it to a fine condition; but in this class of pulverizers, as known to me, the larger particles of material are liable to pass to or near the center of the casing and to be drawn therethrough and passed therefrom without being reduced to as fine a condition as desired.

The object therefore of my invention is to construct and arrange the bats or beaters in such manner that they will act to keep the larger particles of material in suspense within the casing, so as to assure that they will be reduced to a fine condition before being delivered from the casing.

In carrying out my invention I provide a casing and a rotative shaft therein, and to said shaft I attach a series of bats or beaters, which bats or beaters have a lip or web at one end that projects at an angle to the working face of the bat and in the direction of movement of said bat, so as to prevent the particles of material that engage the bat from slipping too quickly edgewise from the bat. The outer edges of these bats are located near the surface of the casing. I also by preference secure to said shaft another series of bats or beaters, that are located nearer the shaft than the bats or beaters first mentioned, and these inner bats or beaters have lips or webs at opposite ends projecting from the working face thereof and in the direction of movement of bats, and said bats or beaters also have a lip or web at the outer edge, which also projects in the direction of movement of the bats. These lips or webs serve to retard the larger particles of material from being thrown outwardly to prevent said particles from passing from the casing until they are reduced to a sufficiently fine condition.

The invention also consists in the novel details of improvement and the combinations of parts that will be more fully hereinafter set forth, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a vertical longitudinal section through a pulverizer embodying my invention. Fig. 2 is a vertical cross-section thereof. Fig. 3 is a perspective view of the bat or beater that lies near the inner surface of the casing. Fig. 4 is a similar view of one of the inner bats or beaters, and Fig. 5 is a vertical section thereof.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the several views, 1 indicates a suitable casing, within which is journaled a shaft 2, which may be suitably rotated. An inlet-opening 5 may be supplied with material to be pulverized in any suitable manner.

6 is an outlet-opening at the opposite end of the casing. Any suitable feeding mechanism may be provided for properly feeding the material to be pulverized to the pulverizer.

8 is a series of arms carried by shaft 2 and projecting radially therefrom within casing 1, and these arms carry bats or beaters 9 9^a, the outer edges of which bats lie near the inner surface of casing 1. These bats 9 are arranged in annular series, there being any desired number in each series, and the series 9^a of such bats, which is the series adjacent to the outlet 6 of casing 1, are turned at an angle to the shaft 2, so as to create an outward draft to force air and pulverized material through the outlet 6. (See Figs. 1 and 2.) The bats 9 at one or both ends have a lip or web 9^b, that projects outwardly from the face of the bat in the direction of its movement. The bats 9 are shown in the form of plates attached to the arms 8. In Fig. 1 I have shown the lips 9^b on the bats 9 as alternating at the ends of the bats—that is to say, the lip 9^b projects from, say, the left-hand end of one bat and from the right-hand end of the bats in the next adjacent annular series; but the relative location of these lips may be altered as desired.

10 is another set of arms carried by the shaft 2 and radially disposed thereon, which

arms are shorter than the arms 8 and arranged in series around the shaft, there being any desired number of said arms in each series. The arms 10 are shown as alternating in position between the arms 8.

11 represents bats or beaters carried by the arms 10 and nearer to the shaft 2 than the bats 9. The bats 11 at each end have lips or webs 11^a, that project from the face thereof in the direction of motion of said bats, and 11^b is a lip carried by each bat 11 at the outer edge thereof, the lip 11^b projecting in the same direction as the lips 11^a, spaces being formed between the adjacent ends of the lips 11^a 11^b for the escape of material from the faces of the bats.

I have shown a series of bats 11 located between the inlet-opening 5 of casing 1 and the first series of bats 9, whereby as the heavy particles of material first enter the casing they will encounter the inner bats 11; but, if preferred, the outer bats 9 may be placed adjacent to the inlet-opening 5.

With the arrangement of bats above described the material that enters the casing 1 will be struck by said bats and will be tossed about within the casing to pulverize the same, and the lips 9^b will tend to keep the particles of material that engage said bats from slipping from the ends thereof too soon, or, in other words, will retard the passage of the material through the casing, so as to keep said material in the presence of the bats until it is reduced to a sufficiently fine condition to enable it to be drawn along by the air carried within the casing. The heavier particles of material will be caught by the bats 11, and the lips 11^a thereof will tend to prevent the passage of these heavy particles lengthwise of the casing, so as to keep them in the presence of said bats to reduce them to a finer condition, while the lips 11^b act to hold said particles in contact that are in contact with the bats, while the finer particles of material may slip from the bats through the spaces at the adjacent edges of the lips 11^a 11^b. By means of the arrangement of bats described the lips or webs 9^b and 11^a form a sort of rotary wall within the casing in line with the bats, whereby the material to be pulverized will be retarded in its passage through the casing, so as to prevent large particles from being passed from the casing, owing to the fact that the weight and momentum of the larger particles are greater in proportion to their superficial area, whereby a more uniform pulverizing of the material may be effected.

A pulverizer of the character described may be used to pulverize fuel and to force such pulverized fuel into a combustion-chamber for the purpose of burning it in the form of a flame.

I do not limit my invention to the precise details of construction shown and described, as they may be varied without departing from the spirit of my invention.

Having now described my invention, what I claim is—

1. A pulverizer comprising a casing having an inlet and an outlet, a rotative shaft therein, and a series of bats or beaters carried by said shaft and provided with a lip or web at one end that projects at an angle to the face of the bat or beater and in the direction of rotation of the latter adapted to obstruct the passage of larger particles of material longitudinally through the casing, substantially as described.

2. A pulverizer comprising a casing having an inlet and an outlet, a rotative shaft therein, radial arms carried by said shaft, certain of said arms being longer than the others, bats or beaters carried by the long arms and having a lip or web at one end that extends substantially at right angles to the axis of the shaft, and bats or beaters carried by the short arms, substantially as described.

3. A pulverizer comprising a casing having an inlet and an outlet, a rotative shaft therein, radial arms carried by said shaft, certain of said arms being longer than others, bats or beaters carried by the long arms and having a lip or web at one end projecting in the direction of rotation of the bats or beaters, and bats or beaters carried by the shorter arms and having a lip or web at their ends and a lip at the outer edge, substantially as described.

4. A pulverizer comprising a casing having an inlet and an outlet, a rotative shaft therein, bats or beaters carried by said shaft, said bats or beaters having a lip or web at the ends and a lip or web at the outer edge, a space being provided between the ends of the adjacent lips or webs, substantially as described.

WM. M. ERNST.

Witnesses:
T. F. BOURNE,
F. E. TURNER.