(No Model.)

G. MEAD.

PULVERIZER.

No. 335,827. Patented Feb. 9, 1886.

Fig. 2.

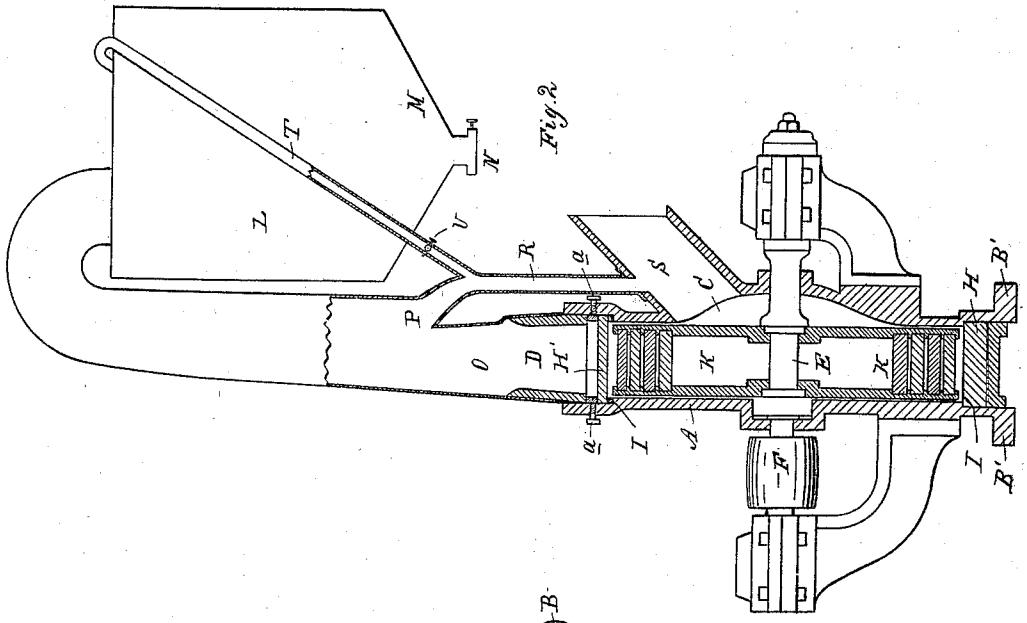
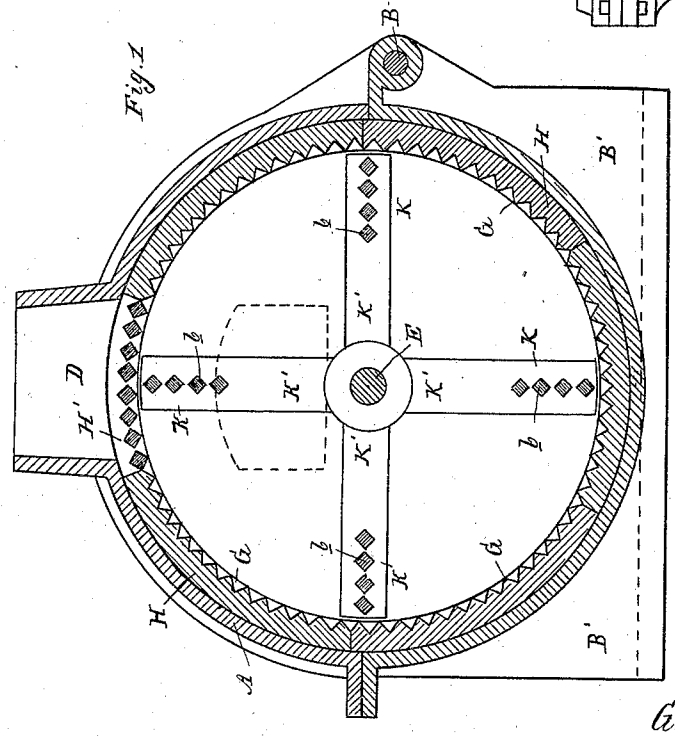


Fig. 1.



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UNITED STATES PATENT OFFICE.

GEORGE MEAD, OF DETROIT, MICHIGAN.

PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 335,827, dated February 9, 1886.

Application filed October 29, 1885. Serial No. 181,241. (No model.)

To all whom it may concern:

Be it known that I, GEORGE MEAD, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Pulverizers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to certain new and useful improvements in pulverizers; and it consists in the peculiar combinations and the novel construction and arrangement of parts, as more fully hereinafter described and claimed.

Figure 1 is a central vertical section of my improved pulverizer; and Fig. 2 is a view, partly in section, taken at right angles to Fig. 1.

A is a cylindrical case horizontally divided into two semicircular halves, which are hinged together at B, the lower half of the case being provided with suitable flanged extensions or legs, B′, for securing it to a foundation.

C is an inlet opening into one side of the case, said side being preferably made with an outward bulge, as shown. D is an outlet-opening on top of the case.

E is a shaft journaled in suitable bearings in the axis of the case and provided with the drive-pulley F.

G is a stationary reducing-surface, consisting of a continuous series of rectangular corrugations formed upon the inner faces of a series of segmental sections, H, which fit against the inside of the cylindrical wall of the case. The reducing-surface covering the outlet D on the inside is different in that it is perforate, while all the rest is imperforate. This reducing-surface covering the outlet D is formed of a series of square bars spaced at a little distance apart and set in a frame so as to form a segmental section, H′, similar to the sections H. The segmental sections H H′ form together a complete ring around the inside of the cylindrical case. They fit with their edges into annular channels I, formed in the heads of the case, and can be easily removed from their seats when the case is opened, suitable set-screws, *a*, being used to hold the section in the upper half of the case in place.

K are a series of revolving paddles or beaters, each consisting of a like number of square steel bars, *b*, secured between the corresponding arms of two spiders, K′, which are suitably secured to the shaft E. These steel bars form a reducing-surface similar to the stationary section H′ of the casing, the bars being spaced apart in the same manner so as to form small openings or perforations between them.

L is a settling-chamber. It has a conical bottom, M, provided with a discharge-spout, N, at the lowest point, said spout being closed with a tight cover when the machine is in operation.

O is a separator-trunk. It connects at one end with the discharge-opening of the machine, and after extending vertically upward some distance connects with the top of the settling-chamber. At some distance above the connection of this trunk with the machine the trunk has a lateral offset, P, and this offset connects with a flue, R, which extends downwardly and opens into the hopper S, which communicates with the inlet-opening C.

T is a pipe or flue leading from the top of the settling-chamber into the flue R. It is preferably connected with the settling-chamber at a point farthest removed from the point of connection of the trunk O with the settling-chamber. It is provided with a valve, U.

In practice the material being introduced in suitable quantities through the feed-hopper S, and the beaters revolving at a high velocity, violent percussion of the material against the reducing-surfaces will take place, the material being also constantly agitated by the strong blast of air created by the beaters. This blast of air issues through the perforations in the reducing-surface into the separator-trunk, creating suction at the inlet-opening C, which is near the center of the case. The blast of air issuing through the perforations of the reducing-surface H′ is met by a back-pressure in the separator-trunk and in the settling-chamber, said back-pressure being caused by the relatively small sizes of the flues R T, the combined area of which is not large enough to admit of a free exit of the whole volume of the blast of air. Therefore the force of the blast in its progress in the separator-trunk will soon be spent and only a gentle flow of air into the settling-chamber will take place. Again, as the

upward current of air in the separator-trunk is expanded after passing the offset P it will become slower, and after passing into the settling-chamber it will become imperceptible.

Now, I will explain the effect of this arrangement on the material subjected to the action of the machine. As soon as the material is reduced fine enough to pass through the perforations it will be carried by the blast into the separator-trunk, where it meets the back-pressure, which acts as an air-cushion and soon deprives it of its momentum. That part of the material which is reduced to a powder and remains suspended in the air will be carried on farther by the air-current into the settling-chamber and accumulate therein on the bottom. All the coarser material, however, after losing its momentum, will be deflected and be thrown out of the upward air-current and drop into the flue R, to be returned again into the machine. To aid the action of the air-blast to deflect such material so that it may drop into the return-flue R, I preferably make the separator-trunk either slightly inclined or give the wall opposite to the offset P a slight inclination.

I claim as the result of my construction and arrangement a machine of great compactness, having a large capacity in relation to its size, and producing a perfect reduction and separation, combined with freedom from dust.

By adjusting the valve U, and thus changing the size of the passage through the pipe T, the product can be obtained of any desired grade of fineness.

What I claim as my invention is—

1. In a pulverizer, a vertical separator-trunk, into which the reduced material is carried by the air-blast and conducted into a settling-chamber, in combination with a settling-chamber, the independent return-flue R of the separator-trunk, and the return-flue T of the independent settling-chamber connecting the same with the pulverizer-case, substantially as described.

2. In a pulverizer, a pulverizer proper, a vertical separator-trunk connecting the pulverizer proper directly with a settling-chamber, a settling-chamber having an independent return-flue of restricted area, an offset in the separator-trunk, and a separate return-flue of restricted area connected with said offset and the flue from the settling-chamber, all arranged and operating in connection with a blast of air, which carries the reduced material into the separator-trunk and settling-chamber, substantially as described.

3. In a pulverizer, the settling-chamber L, provided with the return-flue T, having valve U, the pulverizer proper having inlet-opening C, the vertical separator-trunk O, having offset P and connecting the pulverizer with the settling-chamber, and the return-flue R, connecting the inlet-opening C with the offset in the separator-trunk, all arranged, combined, and operating substantially as described.

4. The case A, having inlet C and outlet D, revolving beaters within said case, settling-chamber L, and separator-trunk O, connecting the settling-chamber directly with the outlet D, combined with the offset P, hopper S, pipe T, connecting the settling-chamber with the flue R, and the flue R, connecting the hopper with said offset, substantially as described.

5. In combination, a stationary cylindrical reducing-surface partly perforated, revolving beaters or paddles, a cylindrical case having a central inlet-opening and a circumferential outlet-opening opposite the perforated stationary reducing-surface, a vertical separator-trunk communicating directly with the outlet-opening, and into which the reduced material is carried by the blast created by the revolving beaters, a settling-chamber connecting with the separator-trunk, a return-flue from the separator-trunk connecting with the inlet-opening, and a return-flue from the settling-chamber communicating with the return-flue from the separator-trunk, substantially as described.

GEORGE MEAD.

Witnesses:
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