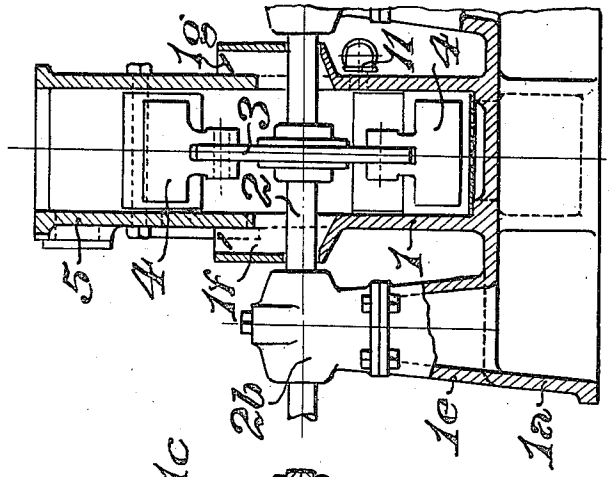
Oct. 30, 1923. 1,472,609

S. C. MARTIN

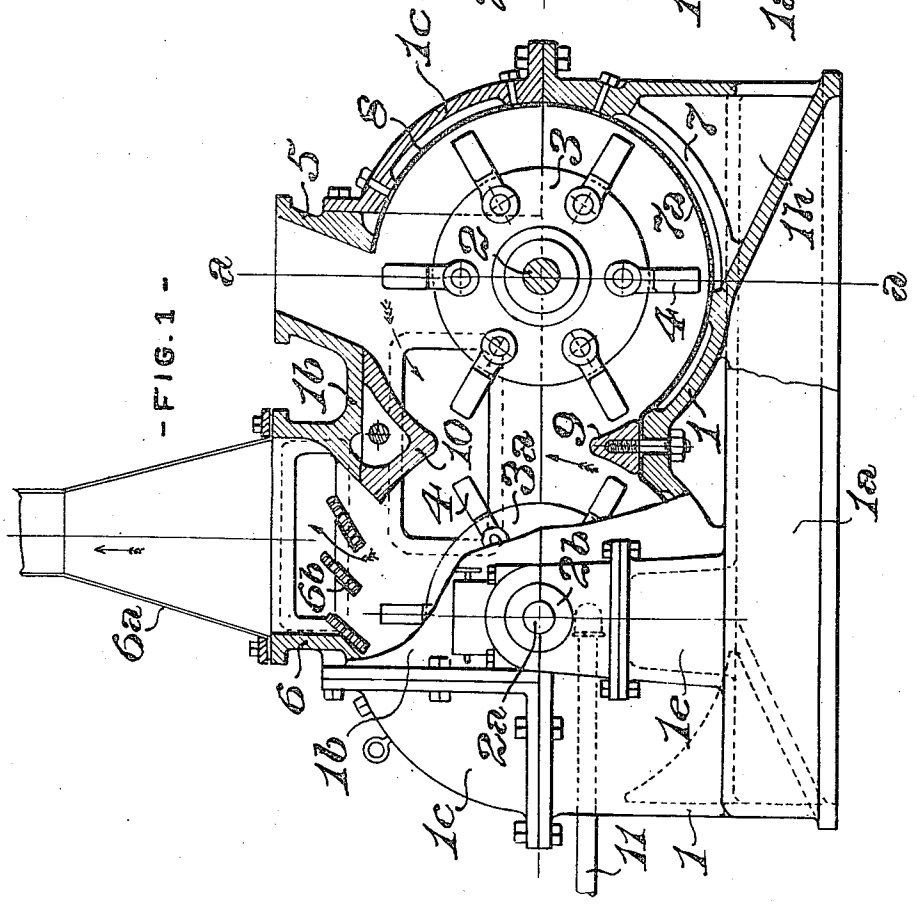
PULVERIZING MACHINE

Filed April 13, 1923

- FIG. 2 -



- FIG. 1 -



WITNESSES

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PULVERIZING MACHINE.

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To all whom it may concern:

Be it known that I, STANTON C. MARTIN, of Erie, in the county of Erie and State of Pennsylvania, have invented a certain new and useful Improvement in Pulverizing Machines, of which improvement the following is a specification.

My invention relates to pulverizing machines of the rotating hammer type, and its object is to provide means for the exertion of a higher degree of impact upon the material to be treated, which shall be usefully operative in connection with different methods of removal of the pulverized material from the machine.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawing: Figure 1 is a view, partly in side elevation, and partly in vertical central longitudinal section, of a pulverizing machine, illustrating an embodiment of my invention; and, Fig. 2, a vertical transverse section through the same, on the line *a a* of Fig. 1.

In the practice of my invention, referring descriptively to the specific embodiment thereof which is herein exemplified, I provide a substantial metallic case or chest, 1, which is substantially in the form of two semi-cylindrical chambers, supported on a suitable bed or base, 1^a. The top of the case is closed by a cover plate, 1^b, having segmental openings in its ends, to afford access to the interior of the case, which openings are closed by detachable door sections, 1^c, secured to the cover plate by flanges and bolts, and forming part of the walls of the upper halves of the chambers of the case.

Two shafts, 2, 2^a, are journalled transversely in the case, 1, concentrically with the chambers thereof, in bearings, 2^b, bolted to standards, 1^e, on the bed, 1^a. A carrier disc, 3, is fixed on one of the shafts, as the shaft, 2, and a similar carrier disc, 3^a, is fixed on the other shaft, as the shaft, 2^a. Each of said discs carries a plurality of hammers or beaters, 4, in the form of transversely extending plates, which are secured to it, adjacent to its periphery. An inlet nozzle, 5, is formed on the cover plate, 1^b, above one of the chambers of the case, 1, and a delivery nozzle, 6, is formed on said plate, above the other chamber. A delivery pipe, 6^a, is connected to the nozzle, 6.

A segmental discharge port, 7, is formed in the bottom of each of the chambers of the case, said openings being closed by detachable and renewable steel liners, 7^a, which may, as hereinafter explained, be either perforated, as shown in Fig. 1, or imperforate. Segmental liners, 8, are secured removably in the upper portions of the chambers, serving, as do the liners, 7^a, to take up wear occasioned by the friction of the material which is operated on.

A detachable and renewable deflector, 9, the sides of which are oppositely inclined, is secured to the bottom of the case, between the chambers thereof, and a deflector, 10, the sides of which are also oppositely inclined, is secured detachably to the cover plate, between the chambers. The deflectors, 9 and 10, serve to deflect the material operated on to the proper direction for the most efficient pulverization. Inclined plates, 6^b, are fixed transversely in the discharge nozzle, 6; air supply passages, 1^f, controlled by dampers, 1^g, are formed on the sides of the case; discharge chutes, 1^h, extend outwardly from the discharge ports, 7; and a fluid supply pipe, 11, leads into one of the chambers of the case. The fluid supply pipe is controlled by a cock or valve (not shown), and may serve for the admission of an inert gas, as flue gas, to prevent explosion of dust, as when coal is pulverized. It may also be used to dry out any moisture in the case.

The pulverizing machine herein set forth is designed for, and suitably adapted to, operation either in the practice of fine pulverization and the removal of the pulverized material by air separation, or that of only moderately fine pulverization, in greater quantity, and the removal of the pulverized material by gravity separation. In the former case, the liners, 7^a, are imperforate, and in the latter, they are perforated, as shown in the drawings. The method of operation in each of these cases will now be described.

First, as to fine pulverization and air separation. In the practice of this method, the liners, 7^a, being, as above stated, imperforate, the discs, 3 and 3^a, are rapidly rotated, in the same direction, as indicated by the arrows in Fig. 1, by connections of their shafts, 2 and 2^a, with a prime mover, which connections are not shown, as they may be of any suitable known type, and do not form part of my present invention. The material to be pulverized is supplied to the chambers of the case, through the inlet nozzle, 5, and

falls in front of the rotating hammers, 4, of the disc, 3. The material is thereby broken up, and directed, by the deflector, 10, against the rapidly advancing hammers of the disc, 3^a, by which it is still finer reduced and thrown back towards the hammers of the disc, 3, until, by impact and attrition, it is finely pulverized. Any material passing around the chamber of the disc, 3^a, is thrown upwardly by the deflector, 9, into the path of the hammers of the disc, 3. The removal of the pulverized material is effected by air separation, air being admitted through the air supply passages, 1^f, and, by the fan action of the rotating hammers, being driven towards the delivery nozzle, 6, carrying the pulverized material with it, through the spaces between the inclined plates, 6^b, by which coarse particles are thrown back to be further pulverized, to the delivery pipe, 6^a, through which, when the material is coal, it may, if desired, be supplied directly to a furnace.

Second, as to coarser pulverization, in greater quantity, and gravity separation, perforated liners, 7^a, being, as before stated, applied. In the practice of this method, the discs, 3 and 3^a, are rotated in opposite directions, the disc, 3, being rotated in the direction of the adjacent arrow, and the disc, 3^a, in the opposite direction, and the deflector, 10, is removed. The material to be pulverized is, as in the former case, supplied through the inlet nozzle, 5, and is thrown backwards and forwards in the chambers of the case by the rapidly and oppositely rotating hammers, until, by impact and attrition, it is reduced to sufficient fineness to allow it to pass through the perforations of the liners, 7^a, into the discharge chutes, 1^h, from which it is supplied to a suitable receptacle.

I claim as my invention and desire to secure by Letters Patent:

1. A pulverizing machine adapted for either fine or coarse work, comprising a double semi-cylindrical casing, parallel rotary hammers in said casing, a material inlet pipe leading into one part of the casing, said part having also a discharge outlet, a deflector at the top of the casing between the two parts thereof, and a removable perforated screen over said outlet, through which coarsely pulverized material is discharged, the hammers in this case being rotated in opposite directions.

2. A pulverizing machine adapted for either fine or coarse work, comprising a double semi-cylindrical casing, parallel rotary hammers in said casing, a vertical outlet pipe for finely pulverized material leading from one part of the casing, an air supply pipe leading into the same part, a material feed pipe leading into the other part of the casing, said last mentioned part having also a discharge outlet, and removable means to close said outlet when air is supplied and the material is finely pulverized, the hammers in that case being rotated in the same direction.

3. In a pulverizing machine, a casing comprising two communicating cylindrical parts, a rotary pulverizer in each of said parts, one of said parts having an upper material inlet and a lower material outlet, and removable means to cover said outlet, the other of said parts having an upper outlet for fine material.

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