R. C. NEWHOUSE.

PULVERIZER.

APPLICATION FILED FEB. 15, 1911.

1,171,747. Patented Feb. 15, 1916.

FIG. 1.

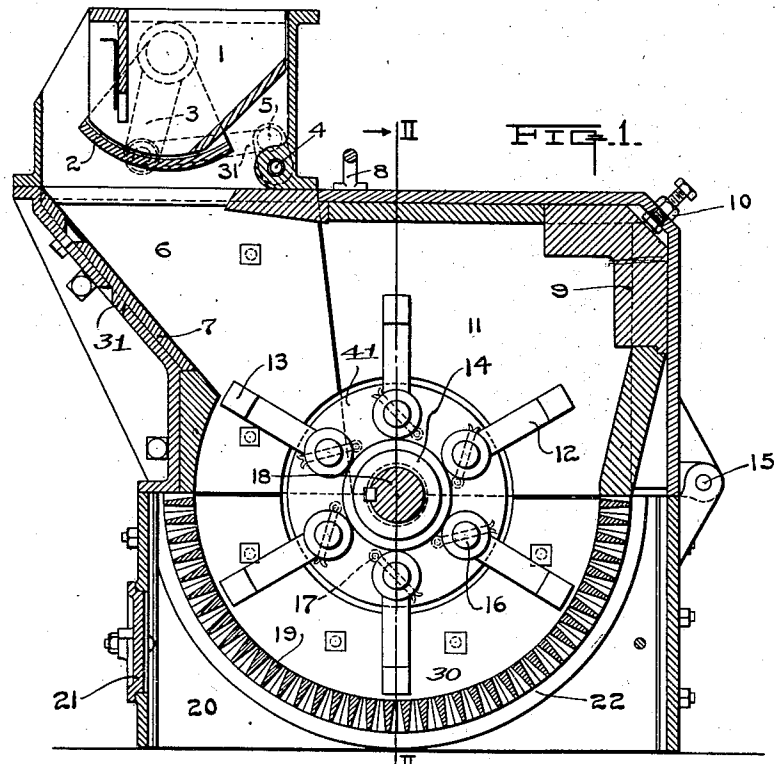
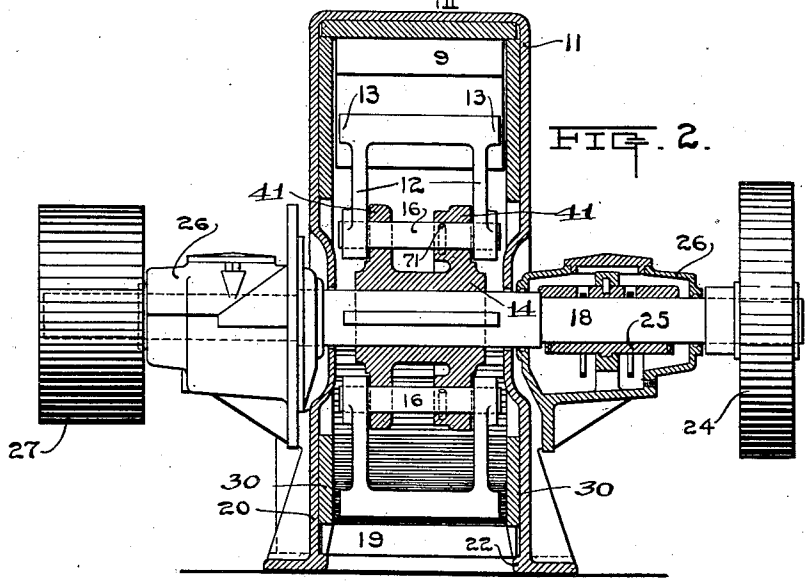


FIG. 2.



WITNESSES -

W. H. Lieber

Ella Brickell

BY

R. C. Newhouse

INVENTOR -

ATTORNEY.

UNITED STATES PATENT OFFICE.

RAY C. NEWHOUSE, OF MILWAUKEE, WISCONSIN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ALLIS-CHALMERS MANUFACTURING COMPANY, A CORPORATION OF DELAWARE.

PULVERIZER.

1,171,747. Specification of Letters Patent. Patented Feb. 15, 1916.

Application filed February 15, 1911. Serial No. 608,661.

To all whom it may concern:

Be it known that I, RAY C. NEWHOUSE, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Pulverizers, of which the following is a specification.

This invention relates to improvements in the construction of pulverizers for reducing hard substances such as rock, to a powder.

The object of the invention is to provide a pulverizer, in which a series of beaters or hammers is mounted upon a shaft and caused to rotate rapidly, the material to be pulverized being admitted to the path of these rapidly rotating hammers and being pulverized by impact therewith, and which puverizer is simple in construction and efficient in operation.

A clear conception of one embodiment of the invention can be obtained by referring to the accompanying drawing in which like reference characters designate the same or similar parts in different views.

Figure 1 is a transverse, vertical section through a pulverizer and feeder therefor. Fig. 2 is a vertical section through the device shown in Fig. 1, looking in the direction of the arrow and having all but two vertical hammers omitted therefrom.

The pulverizer consists essentially of a shaft 18 mounted in bearings 25 which are supported by the stationary pulverizer casing or frame 20. The bearing caps 26 inclose the bearings 25 and form lubricating chambers from which lubricant is carried to the bearings 25 by means of oil rings or in any other suitable manner. The driving pulley 27 is fixed to one of the overhanging ends of the shaft 18, while the flywheel 24 is mounted on the opposite overhanging end thereof.

The suspension member 14 consists of two parallel flanges 41 extending outwardly from a central hub which is keyed to the shaft 18. The one-piece bail-shaped beaters or hammers 12 are suspended from the overhanging ends of pins 16 which pass through the parallel flanges 41 of the member 14. The hammers 12 are free to oscillate about the ends of the pins 16, the pins 16 being fixed or locked to the hammer carrying member 14 by means of cotter pins 17 which pass through holes 71 formed in bosses on the member 14. The hammers 12 are formed with laterally extending projections 13 which closely fit the pulverizer casing and prevent the existence of dead space within the casing in which material might lodge and not be subjected to the pulverizing action of the hammers.

The casing 20 has semi-circular guides or flanges 22 projecting therefrom upon which a series of individual screen bars 19 are supported. The screen bars 19 are retained in position by liners 30 which are bolted to the sides of the casing 20 and are locked against end movement by the cover casing 11. A manhole 21 is formed in the end of the casing 20 and permits inspection of the interior of the casing below the screen bars 19. The feeder supporting casing 6 is mounted upon the lower casing 20 and supports a swinging feeder 1. The swinging feeder 1 consists of a hopper below which a hood 2 is adapted to be oscillated by a lever 3 connected to a crank 5 by means of a connection 31. The crank 5 is adapted to be rotated by any suitable power applied to the shaft 4. The feed liner 7 is fixed to an inclined side of the feeder supporting casing 6, being held in position by a downwardly projecting lug 31 formed integral therewith and extending into a recess in the casing 6. Bolts which pass through the liner 7 and casing 6 further serve to maintain the liner 7 in position.

The cover casing 11 closes the upper portion of the casing 20 which is not closed by the feeder supporting casing 6. The cover casing 11 is adapted to be swung open about the hinges 15 by means of handles 8. The upper corner of the cover casing 11 which is directly opposite the feeder 1 is provided with a heavy liner 9. The liner 9 is held in position by means of a locking bolt 10 and can be easily removed for replacement.

The various casings are recessed at their portions surrounding the shaft 18, this construction permitting location of the bearings 25 as near to the crushing members as possible, thus shortening the length of the machine.

During the operation of the pulverizer, the material to be pulverized is admitted to

the feed hopper 1, the hood 2 is oscillated by the rotation of the crank 5, thereby intermittently discharging lumps of the raw material upon the liner 7. As the material slides down the liner 7 it is precipitated into the path of the rapidly rotating hammers 12. The impact of the hammers 12 against the lumps of material causes them to be either broken or thrown at a high velocity against the liners 9. The impact of the unbroken material against the liners causes further disintegration thereof. After impact with the liners the material drops by gravity into the path of the beaters and is further pulverized by impact of the hammers 12. This subjection of the material to the impact of the hammers and liners is continued until the same is pulverized to a sufficient degree of fineness to permit passage thereof between the screen bars 19 when it is discharged from the interior of the casing.

It will be noted that with the construction of hammers 12 with the overhanging ends 13, material is prevented from lodging in the corners of the casing, thereby avoiding the beating action of the hammers. The recessing of the casings furthermore permits location of the bearings for the shaft 18 as near the hammers as possible, such construction being permitted by forming the disks for supporting the hammers between the inwardly projecting radial arms of the hammers 12, rather than having these arms pass between the supporting disks.

If it is desired to replace any of the hammers 12, it is necessary only to swing back the cover casing 11, withdraw the cotter pin 17, and remove the pin 16. As the most wear on the pin 16 will take place adjacent the shaft 18, by fixing or screwing the pin 16 relative to the suspension member 14, the wear on the pins is controlled and limited to two angular positions of the pins. This is made possible since the pin 16 when worn can be adjusted by rotating through an angle of 180 degrees, exposing unworn portions for further coaction with the hammers 12.

If the screen bars 19 become excessively worn they can be easily removed by sliding same out of the circumferential grooves formed between the flanges 22 and the casing linings 30. As the bars 19 are not fixed to each other, any one of said bars can be easily replaced without replacement of undamaged bars.

It should be understood that it is not desired to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

It is claimed and desired to secure by Letters Patent,—

1. In a pulverizer, a casing, a shaft mounted to rotate within said casing, a suspension member fixed to said shaft, a single pin adjustably mounted in said suspension member, means for positively locking said pin in an adjusted position and against rotation relative to said suspension member, and a single hammer engaging said pin on opposite sides of said locking means, said hammer being swingable upon said pin as a pivot.

2. In a pulverizer, a casing having inwardly projecting recessed side portions, a shaft extending through said casing, bearings for said shaft located on opposite sides of said casing, said bearings extending into the recessed portions of said casing, and a hammer suspended from a portion of said shaft between said bearings, said hammer having side projections extending outwardly toward said casing.

3. In a pulverizer, a casing having inwardly projecting recessed side portions, a rotary shaft extending through said casing, bearings for said shaft located on opposite sides of said casing, said bearings extending into the recessed portions of said casing, a suspension member secured to said shaft intermediate said bearings, a single pin adjustably mounted in said suspension member, means for positively locking said pin in an adjusted position and against rotation relative to said suspension member, and a single bail-shaped hammer having inwardly extending arms engaging the overhanging ends of said pin on opposite sides of said locking means, said hammer being swingable upon said pin as a pivot.

4. In a pulverizer, a casing, a shaft mounted to rotate within said casing, a suspension member fixed to said shaft and having an opening, a single pin adjustably mounted in said suspension member and having an opening alinable with said suspension member opening, means engageable with said openings for positively locking said pin in an adjusted position and against rotation relative to said suspension member, and a single hammer engaging said pin on the opposite sides of said locking means, said hammer being swingable upon said pin as a pivot.

In testimony whereof, I affix my signature in the presence of two witnesses.

RAY C. NEWHOUSE.

Witnesses:
G. F. De Wein,
W. H. Lieber.