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W. S. WESTON

GYRATORY CRUSHING MACHINE

Filed March 5, 1923

Fig. 1.

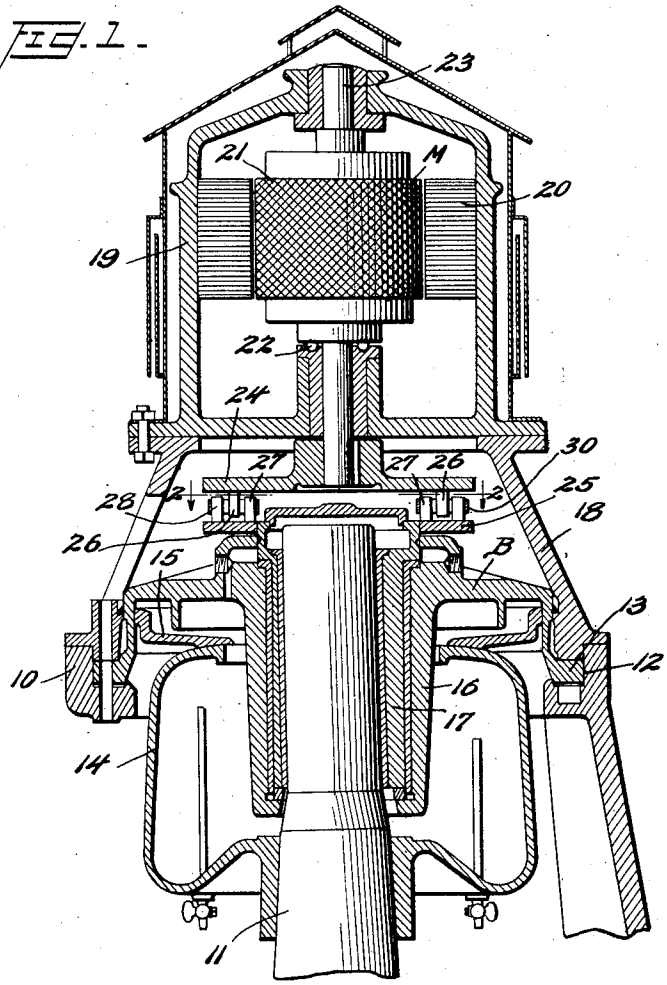
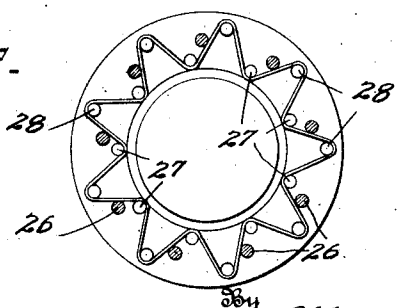


Fig. 2.



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UNITED STATES PATENT OFFICE.

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GYRATORY CRUSHING MACHINE.

Application filed March 5, 1923. Serial No. 623,037.

The present invention relates to gyratory crushing machines and particularly to the driving means for such machines.

In my copending application, Serial No. 456,663, filed March 29, 1921, is described and claimed a gyratory crushing machine in which the eccentric for driving the shaft is rotatably mounted in a bearing supported at the top of the main frame, which eccentric is connected to a pulley in one form of the invention and to the armature of an electric motor in a second form, to be directly driven thereby. The present invention relates particularly to the means for supporting an electric motor upon the main frame of the machine and to the means for connecting the motor and eccentric. The invention may have various embodiments, one of which is illustrated in the accompanying drawings by way of example.

In the drawings:

Figure 1 is an axial section through the upper end of the motor driven gyratory crushing machine; and

Figure 2 is a section on the line 2—2 of Figure 1.

The main frame of the machine is indicated at 10 and it will be understood that this frame is supported adjacent its lower end and constitutes a support and housing for the gyratory shaft 11 and the crushing jaws, which are not illustrated. The annular upper end of the frame is axially recessed or counterbored at 12 to receive the rim or edge 13 of the bearing member indicated generally at B. The exact construction and function of the bearing member B, the oil cup 14, the dust cap 15, and other elements of the machine are fully described in my copending application Serial No. 527,648 filed Jan. 7, 1922, and it is sufficient here to state only that the sleeve 16 of the bearing B supports the eccentric 17 axially of the machine in such manner that the eccentric may not only rotate freely in the bearing but may also tilt slightly (with the bearing) when the shaft 11 is flexed under a heavy load, so that no strain is imposed upon the eccentric or the bearing B due to any such flexure of the shaft.

Bolted to the annular upper end of the frame is a pedestal member or stand 18 the lower end of which constitutes an abutment to prevent the bearing B from becoming displaced and to the upper end of which is bolted the motor housing 19. Within the motor housing is supported the motor M having the fixed stator 20 and the rotatable armature 21 which is supported upon a thrust bearing 22 and is provided with the usual motor shaft 23.

To the lower end of the motor shaft 23 is keyed or otherwise suitably secured a disk 24 which is spaced from and parallel to a second disk 25 which is integral with or rigidly secured to the upper end of the eccentric. From the disk 24 a plurality of pins 26 project downwardly, these pins being spaced at equal distances from each other and equidistant from the center of the motor shaft. Projecting upwardly from the disk 25 is an inner series of similar pins 27 and also an outer series of pins 28, the pins of each series being spaced at equal intervals and being arranged in circles having a common center, which is on the axis of rotation of the eccentric 17. The pins 26 lie between the inner and outer series of pins 27 and 28 respectively, as can be seen clearly from Figure 2. A continuous band 30 of leather, fiber or other flexible or semi-flexible material of great strength is laced over the pins secured to the eccentric disk 25 in the manner clearly shown in Figure 2.

When the motor is started each pin 26 will strike one reach of the belt 30, whichever the direction of rotation of the motor, and hence the eccentric will be driven. With a connection of this character it will be seen that any slight lateral movement of the eccentric which may result from wearing of the bearing or eccentric may take place without any strains being imposed upon the motor shaft or motor shaft bearings and that furthermore it is unnecessary to bring the eccentric and motor shafts into exact or theoretical alignment in setting up the machine. If it is desirable to remove the motor for the purpose of inspecting the bearing B, or eccentric, the stand 18, or the motor housing 19 may be detached freely inasmuch as the pins 26 have no positive connection to the belt 30.

To one skilled in the art the advantages of the invention will be apparent and it will also be obvious that changes may be made in the design and arrangement of the component elements of the invention without departing from its scope.

Having thus described the invention what

is claimed as new and desired to be secured by Letters Patent is:

1. In a gyratory crushing machine, in combination, a frame, an eccentric positioned at the upper end of the frame for gyrating a crushing shaft, said eccentric being centrally arranged on and entirely supported by the frame, a pedestal mounted on the upper end of the frame and extending upwardly beyond the upper end of the eccentric, a motor detachably mounted on the pedestal substantially coaxially with the eccentric, and operating connections between the motor and eccentric which are freely separable by upward axial movement of the motor.

2. In a gyratory crushing machine, in combination, a frame having a socket or recess in its upper end, a bearing mounted in said socket for limited tilting movement therein, an eccentric mounted in the bearing for gyrating a crushing shaft, a pedestal mounted on the upper end of the frame, the lower end of said pedestal cooperating with the frame in holding said bearing in position for limited movement only, and a motor mounted on said pedestal and connected to said eccentric.

3. In a gyratory crushing machine, in combination, a frame, a bearing mounted in the upper end of the frame so as to be tiltable, an eccentric revolubly mounted in the bearing for gyrating a crushing shaft, and a motor rigidly supported on the upper end of the frame and connected to the eccentric by a flexible coupling device.

4. In a gyratory crushing machine, in combination, a frame, a bearing supported on the frame for tilting movement, an eccentric mounted in the bearing for gyrating a crushing shaft, a motor mounted on the frame, and a flexible connection between the motor and eccentric.

5. In a gyratory crushing machine, in combination, a frame, an eccentric revolubly supported on the frame, a motor supported on the frame and having a motor shaft in substantial alignment with the eccentric, spaced parallel disks on the motor shaft and eccentric respectively, and flexible means connecting said disks, said flexible means being so designed and constructed that the motor may be quickly removed and replaced without manipulating or unfastening said means.

6. In a gyratory crushing machine, in combination, an eccentric, a driving motor having a shaft substantially aligned with said eccentric and terminating adjacent the end of the eccentric, and flexible means connecting the adjacent ends of the motor shaft and eccentric, said means being designed and constructed to permit the removal and replacement of the motor without altering or unfastening any portion of said means.

In testimony whereof I hereunto affix my signature.

WILLIAM S. WESTON.