

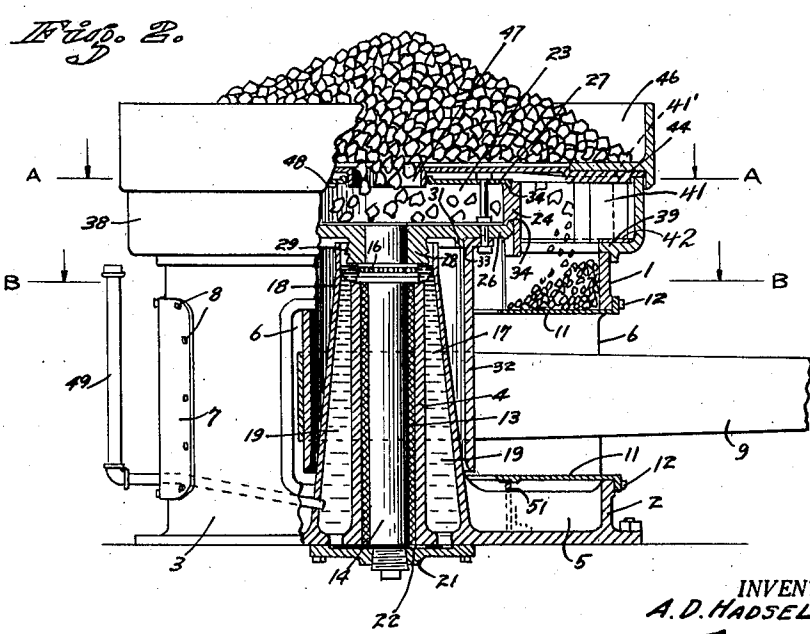
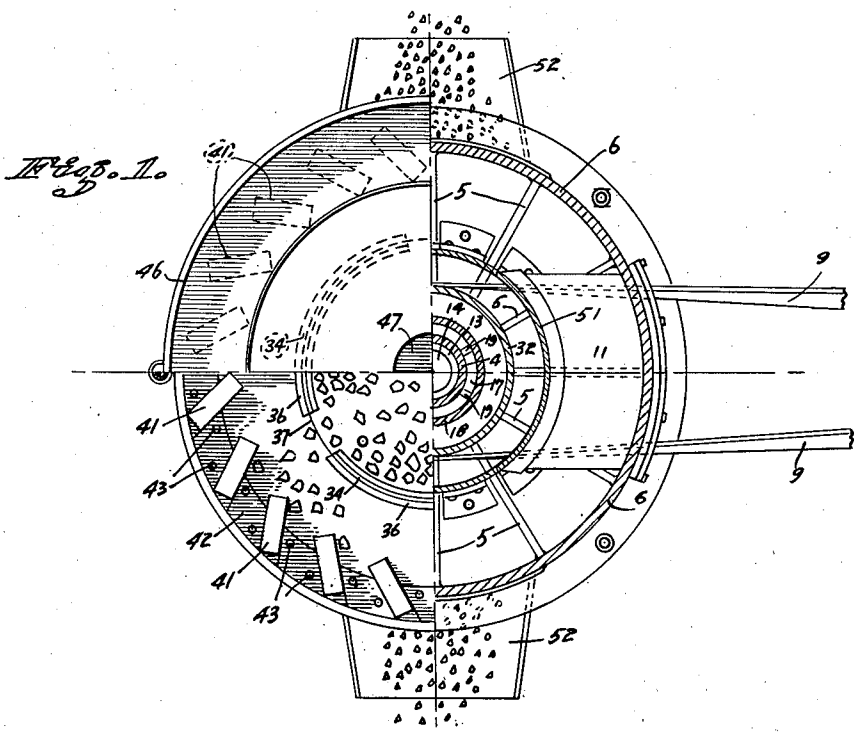
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A. D. HADSEL

ROCK CRUSHER

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# UNITED STATES PATENT OFFICE.

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## ROCK CRUSHER.

Application filed March 5, 1923. Serial No. 623,041.

*To all whom it may concern:*

Be it known that I, ALVAH D. HADSEL, a citizen of the United States, and a resident of San Francisco, county of San Francisco, State of California, have invented a new and useful Rock Crusher, of which the following is a specification.

The present invention relates to improvements in rock crushers, and has particular reference to a centrifugal rock crusher designed for continuous operation. The principal object of the invention is to provide a machine of the character described that will be highly effective, that is simple in construction and well balanced. A further object of the invention is to provide a particular type of rotor and a particular type of concave both of which are designed for reduction of wear. A further object of the invention is to provide a concave against which the rocks are thrown that is constructed in such a manner that blocks of metal exposed to the rocks thrown by centrifugal force may be changed in their position so as to allow of the successive exposure of eight different edges. Other objects and advantages will appear as the specification proceeds.

The preferred form of my invention is illustrated in the accompanying drawing, in which Figure 1 shows a view of my device partly in plan, partly in section, taken along line A—A of Figure 2, and partly in section taken along line B—B of Figure 2, and Figure 2 a side view of my device partly shown in section. While I have shown only the preferred form of the invention, it should be understood that various changes or modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

My rock crusher (1) comprises a frame (2) consisting of two cylindrical elements (3) and (4) arranged in concentric relation and connected by means of webs (5). The outer element (3) is provided with a plurality of openings (6) adapted to be closed when desired by means of plates (7) bolted thereto as shown at (8). Any of these openings may be used to allow the belt (9) to pass therethrough which latter is protected from rocks by means of a metal casing (11) projecting inwardly through one of the openings and bolted to the cylindrical element (4) as shown at (12) and surrounding the area controlled by the belt (9). The

inner element (4) consists of a tube adapted to rotatably receive, with a bushing (13) interposed, the main shaft (14) of my device, which latter is supported by means of a thrust bearing (16) resting on the tube. This tube at the same time forms the inner wall of an oil chamber (17) surrounding the whole tube. The outer wall (18) of said chamber which is connected to the inner wall (4) by means of webs (19) extends above the bearing (16) so as to allow the chamber to be filled with oil to a height exceeding the level of the bearing. The oil chambers are closed at the bottom by a bottom plate (21) which is provided with a recess (22) allowing the oil to flow underneath the shaft (14) so that complete circulation of oil around the shaft is provided.

To the upper end of the shaft is secured the rotor (23) comprising a cylindrical member (24), a base plate (26) and a top plate (27). The base plate is provided with a central hub (28) toothed as shown at (29) to return oil that may splash upwardly, and a downwardly extending flange (31) around which is placed the cylinder (32) serving as a pulley for the rotor. The latter cylinder is secured to the base plate by means of bolts (33), some of which extend upwardly so as to pass through the top plate (27) and to hold the same in place. Both top and bottom plates are provided with peripheral flanges (34) adapted to be received in registering peripheral grooves of the cylindrical member (24). The latter member consists preferably of three sections (36) leaving spaces between the same as shown at (37) through which the rocks may be thrown outwardly by centrifugal force.

The outer frame member (3) supports the bowl (38) which latter is disposed on the same plane with the rotor and in concentric relation to the same. This bowl is open at the bottom except for a small peripheral flange (39) on which are supported the impact receiving plates or blocks (41). The latter are disposed at a suitable angle to radial lines, and are made of square vertical section. They are held in place by means of plates (42) bolted to the flange (39) by means of bolts (43), the plates engaging the lower edges of the blocks. The upper edges of the same blocks are held in place by the top plate (44) of the bowl which is provided with corresponding slots or grooves as dotted at (41) so as to hold the blocks in place.

A particular feature of this arrangement is that these blocks may be turned around eight times to expose a new edge to the rocks thrown outwardly by the rotor. Above the bowl (38) is mounted the hopper (46) provided with an opening (47) communicating with the neck (48) of the rotor.

Oil is allowed to enter the chamber (17) through the pipe (49). A cylindrical wall (51) surrounding the pulley (32) serves as a division wall and prevents the rocks falling through the bottom of the bowl from striking the pulley. The broken rocks drop on chutes (52).

The operation of the device will be readily understood from the foregoing description. The rocks to be crushed are placed in the hopper by any suitable means and dropped through the opening in the bottom of the same into the rotor (23). The latter is rotated by means of any suitable power engaging through the belt (9) the pulley (32). Particular attention is drawn to the manner in which the rotor is supported by the bearing (16) and the long engaging faces of the shaft (14) and the bushing (13) surrounding the same, as well as to the means for oiling the bearings. As the rotor rotates rocks are forced through the openings (37) between the sections (36), while a certain number of rocks are allowed to gather behind the sections (36) and to form a guideway for the rotating rocks, thereby taking the main strain off the edges of the sections (36). The rocks are thrown vio-

lently against the blocks (41) and come in crushing contact with the same, whereupon they drop through the open bottom of the bowl (38) into the chamber defined by the outer frame element (2) and the cylinder (51), so that at no time they come in contact with the pulley (32) or the belt (9), which latter is additionally protected by the casing (11).

I claim:

1. In a centrifugal rock crusher, a supporting element, a bowl mounted thereon, a rotor mounted within the bowl and disposed to discharge material outwardly toward the rim of the bowl, and a plurality of square blocks spacedly arranged in the bowl in peripheral relation to the rotor each at an angle to a radial line therefrom and each block being reversible to eight different positions for exposing any of eight angular edges to the impact of the material.

2. In a centrifugal rock crusher, a rotor adapted to hurl the rocks tangentially therefrom, a cylindrical member surrounding the rotor, a series of square impact blocks, upper and lower grooved annular members associated with said cylindrical member engaging and clamping said blocks in spaced relation peripherally around the rotor, said blocks each having eight angular edges of equal length and being reversible in the grooves to eight different positions to bring any one of the eight edges into impact receiving position.

ALVAH D. HADSEL.