No. 720,853. PATENTED FEB. 17, 1903.

J. D. SPARGO & G. W. ROSE.

CONCAVE FOR ROCK CRUSHERS.

APPLICATION FILED JUNE 4, 1902.

NO MODEL.

Fig. 1.

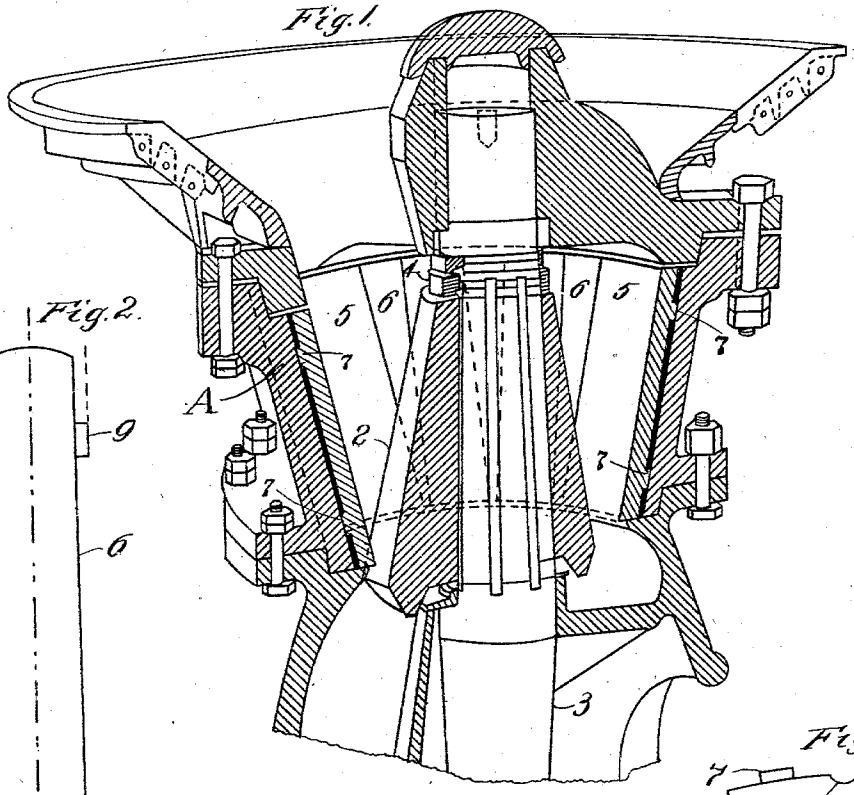


Fig. 2.

Fig. 5.

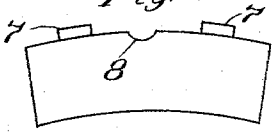


Fig. 3.

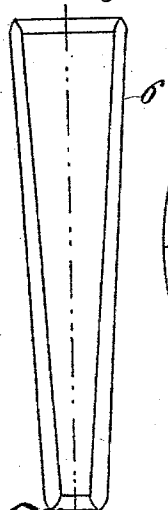
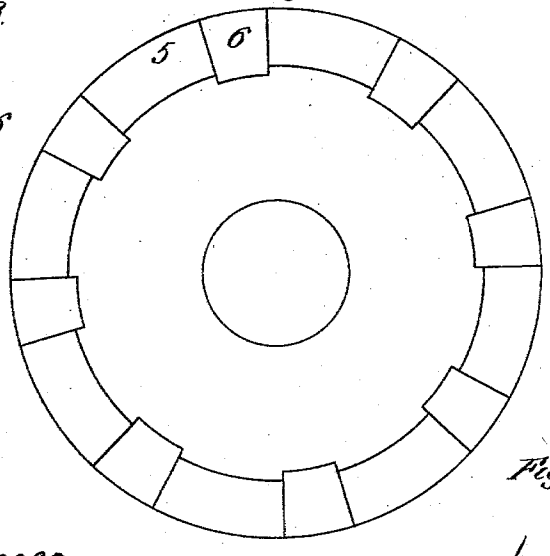


Fig. 4.



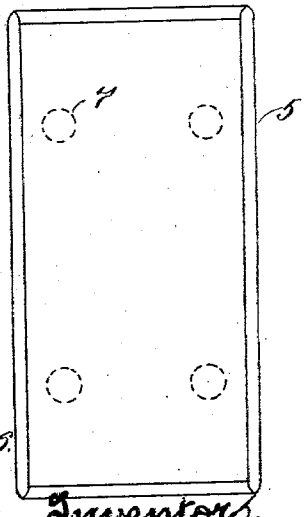


Fig. 6.

Witnesses,
Max Wale.
J. L. Bonsall

Inventors,
John D. Spargo
George W. Rose
By Dewey Strong & Co. Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN DEEBLE SPARGO AND GEORGE WILLIAM ROSE, OF DOBLE, CALIFORNIA.

CONCAVE FOR ROCK-CRUSHERS.

SPECIFICATION forming part of Letters Patent No. 720,853, dated February 17, 1903.

Application filed June 4, 1902. Serial No. 110,177. (No model.)

To all whom it may concern:

Be it known that we, JOHN DEEBLE SPARGO and GEORGE WILLIAM ROSE, citizens of the United States, residing at Doble, county of San Bernardino, State of California, have invented an Improvement in Concaves for Rock-Crushers; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to improvements in rock-crushers of the gyratory type, and pertains particularly to the concaves or grinding-surfaces thereof. In these machines the crushing is done between a central gyratory cone-shaft and an inverted conical shell. As the shaft revolves the crushing-cone impinges against the sides of the shell, in relation to which it is constantly approaching and receding. The grinding-surfaces of the shell consist of concaved segments, which heretofore have been made wedge-shaped, being wider at the top and narrower at the bottom. When the lower end of these segments or concaves becomes badly worn, they have to be discarded, and as they are made of manganese-steel they are very expensive in the larger sizes of breakers.

The object of our invention is to provide a concave that may be reversed when one end has become worn, and thus, in fact, double the life of these wearing-surfaces.

The invention consists in making these concaves rectangular or with parallel side edges instead of wedge-shaped and employing keys to lock the concaves together, said keys being wedge-shaped and having their lower ends thicker than their upper ends.

Having reference to the accompanying drawings, Figure 1 is a perspective view in section of a crusher with our invention applied. Fig. 2 is a side elevation of a key. Fig. 3 is a front elevation of a key. Fig. 4 is a lower end view of the concaves and keys in position. Fig. 5 is an end view of a concave. Fig. 6 is a front elevation of a concave.

A represents the shell of a gyratory crusher.

2 is a cone fixed upon a shaft 3, which is suitably stepped at the top, as at 4, and is given a gyratory movement by any suitable means connecting with the lower end of the shaft, but not necessary here to be shown.

The interior periphery of the shell is lined with the alternating concaves 5 and keys 6, neatly fitted and locked together and forming the stationary wearing-surface of the breaker. Each concave is rectangular in outline and is provided with the bosses 7 and a longitudinal groove 8 on the back. The keys are provided with similar bosses 9. The bosses on the concaves and keys serve to hold them out of contact with the shell, while the grooves permit molten zinc to be poured into the annular space between the concaves and shell, and so firmly lock the parts in position. The keys are wedge-shaped and are correspondingly concaved in their upper portion. Their surfaces gradually taper outward toward the lower narrowed end, which is about three-eighths of an inch thicker than the top of the key or the concaves. Experience shows that on account of the narrowness of the bottom end the keys do not wear as fast as the concaves. Most of the wear on the concaves naturally comes at or near the bottom.

When a set of our concaves has become worn at one end, the concaves may be reversed, thus effecting a saving of practically one-half in the expense of maintenance of the breaker. In mining operations where low milling expenses are of importance this saving becomes appreciable.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination in a rock-crusher of a shell and separable concaved or grinding surfaces said concaves or surfaces having parallel side edges, and locking-keys between adjacent concaves and tapering from one end to the other.

2. The combination in a rock-crusher of removable concaves having parallel side edges whereby they may be reversed end for end, and means including intermediate longitudinally-tapering keys for holding the concaves in position.

3. In a rock-crusher, the combination of

removable concaves having parallel side edges and intermediate longitudinally wedge-shaped keys interlocking with the concaves.

4. In a rock-crusher, the combination of sectional rectangular-shaped concaves and interlocking wedge-shaped keys, said keys being thicker at their narrowed end than at the top and said end being also thicker than the concaves.

In witness whereof we have hereunto set our hands.

JOHN DEEBLE SPARGO.
GEORGE WILLIAM ROSE.

Witnesses:
ED. DOLCH,
E. BALSBAUGH.