M. QUENNER.

PROJECTILE FOR ROCK BREAKERS.

APPLICATION FILED JAN. 24, 1911.

1,076,148.

Patented Oct. 21, 1913.

2 SHEETS—SHEET 1.

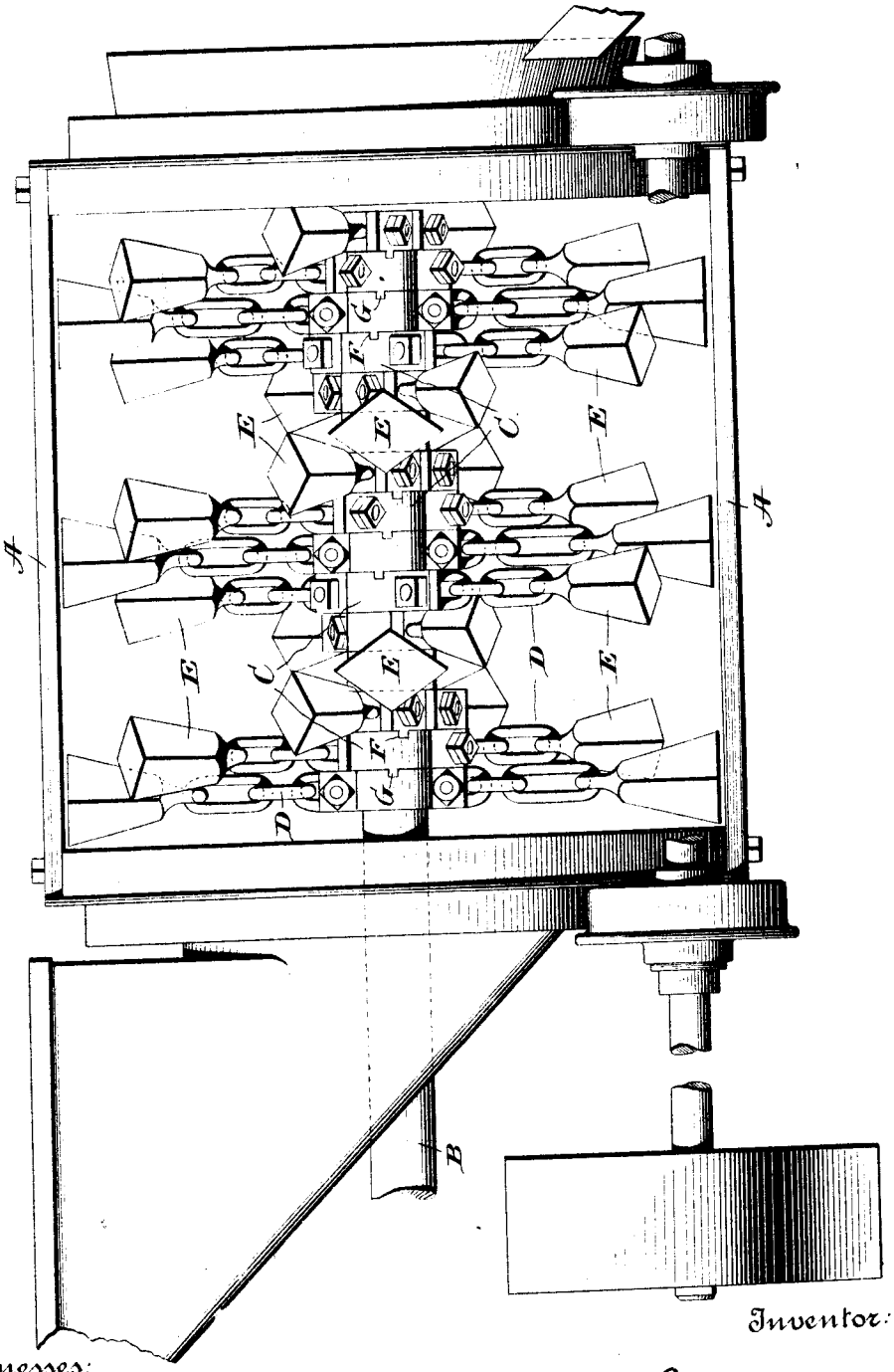


Fig. 1.

Witnesses:

Jas. E. Hutchinson:

Charles Thomas

Inventor:

Mitts Quenner,

By Macdonald & Co. Attorneys:

M. QUENNER.

PROJECTILE FOR ROCK BREAKERS.

APPLICATION FILED JAN. 24, 1911.

1,076,148.

Patented Oct. 21, 1913.

2 SHEETS—SHEET 2.

Fig. 2.

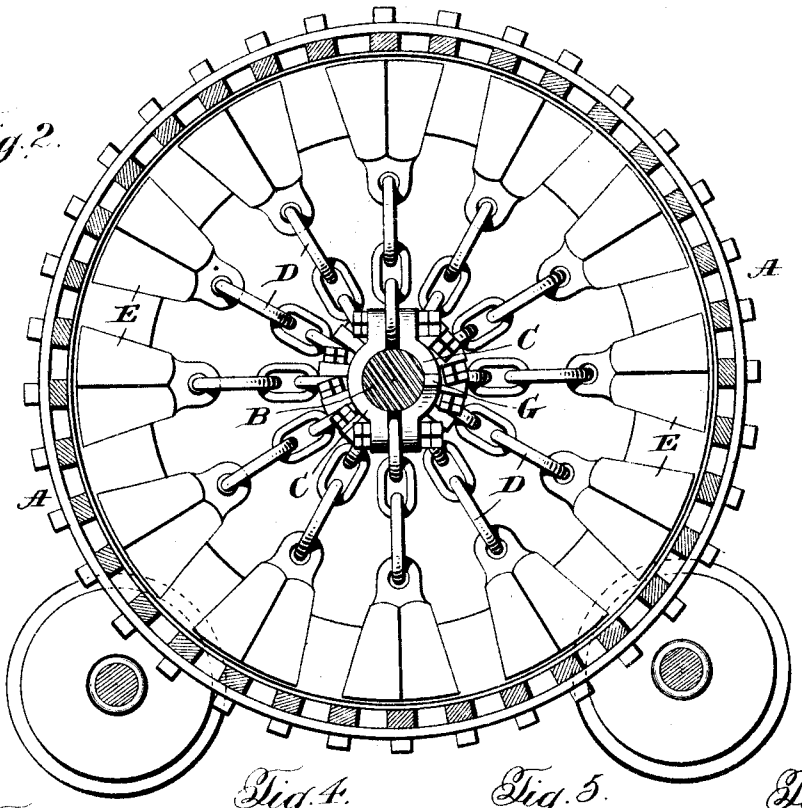


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 3.

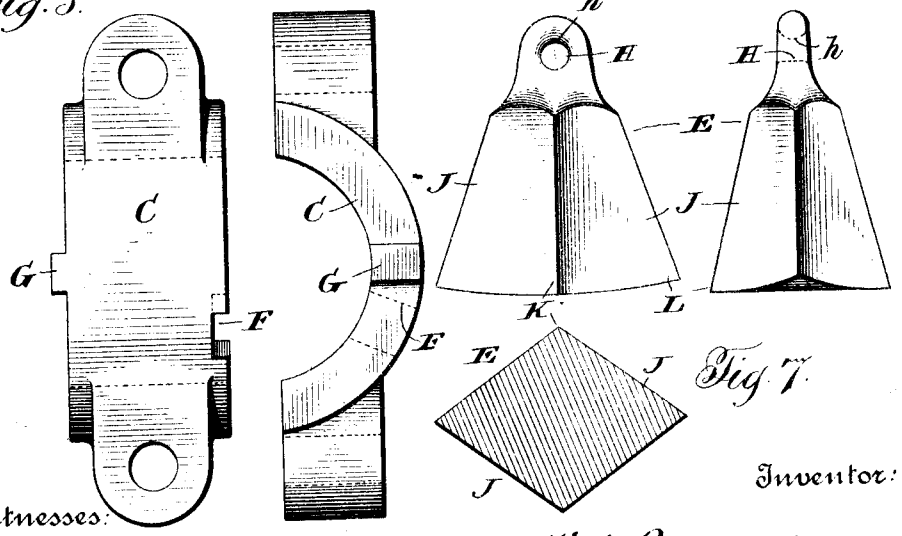


Fig. 7.

Witnesses:

Jas. E. Hutchinson:

Charles Thomas

Inventor:

Mitts Quenner,

By Macomber & Macomber Attorneys:

UNITED STATES PATENT OFFICE.

MITTS QUENNER, OF NOGALES, ARIZONA, ASSIGNOR TO QUENNER DRY CRUSHER COMPANY, OF DOUGLAS, ARIZONA, A CORPORATION OF ARIZONA.

PROJECTILE FOR ROCK-BREAKERS.

1,076,148. Specification of Letters Patent. Patented Oct. 21, 1913.

Application filed January 24, 1911. Serial No. 604,405.

To all whom it may concern:

Be it known that I. MITTS QUENNER, a citizen of the United States, residing at Nogales, in the county of Santa Cruz and State of Arizona, have invented certain new and useful Improvements in Projectiles for Rock-Breakers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in projectiles and has for its object the provision of a projectile primarily designed for use in the breaking of rock and similar substances, especially in connection with my improved method of and apparatus for shattering rock through the medium of the impact blows of a plurality of the projectiles against the material being broken while the latter is in a free or floating state.

Desirable characteristics of the invention reside in the reversibility of the projectile whereby the greatest possible use of the same may be obtained with correspondingly decreased expense; the formation of the faces of the projectile to obtain maximum efficiency in its shattering operation, and the general contour and formation of the projectile whereby the same is given substantial weight and reinforcement in the line of its impact movement to prevent breakage and also increase the severity of the impact blow.

The invention also comprehends means for adjusting the projectile upon a shaft in fixed operative relation to other projectiles; and the combination of the projectiles thus assembled.

Details in the construction and arrangement of the several parts of the device will be apparent from the specific description hereinafter contained when read in connection with the accompanying drawings forming part hereof and wherein a convenient embodiment of the invention is illustrated.

In the drawings: Figure 1 is a longitudinal sectional view of a grizzly in combination with shattering instrumentalities on the interior thereof including my improved projectile; Fig. 2 is a transverse sectional view, Fig. 3 is an edge view of one of the clamping collars, Figs. 4 and 5 are side and edge views respectively of one of the projectiles, and, Fig. 6 is a cross section of the projectile. Fig. 7 is cross section of the hammer shown in Fig. 5.

Referring more specifically to the drawings wherein like reference characters designate corresponding parts in the several views, A represents the grizzly which is conveniently of a rotary cylindrical formation. B the projectile carrying shaft rotatable through the medium of any suitable means, C the collars for securing the projectile to the shaft in a progressively advancing relation, D the flexible intermediate connections, in this instance chains, and E the breaker heads or projectiles.

Preferably the projectiles are mounted on the shaft in close association, but in a gradually progressing series, so that they assume a spiral relation when in operation to render successive and rapid impacting blows on the rock or other material being treated and at the same time tend to feed the same lengthwise of the grizzly. To maintain the projectiles in this position and to obtain an even spacing thereof one face of each of the securing collars is provided with a recess F, while the opposite face thereof has a lug G so that the adjoining collars are interlocked and by the gradually progressing arrangement of the complementary lugs and recesses a spiral arrangement of the projectiles is insured.

The projectiles are formed of steel of the shape especially illustrated in Figs. 4 and 5. The upper end of the projectile is relatively flat and perforated, as at H, with a rounded upper edge *h* for the reception of the outer link of the chain and to facilitate free and easy movement of the projectile on said link as the projectile is swung outwardly incident to centrifugal force under the actuation of the machine.

J represents approximately radially disposed angular forward and rear edges of the projectile, these edges being designed to give the shattering blow to the rock and rendering the projectile reversible, as is obvious.

As seen in Fig. 6, the general cross-sectional contour of the projectile is rectangular, the side enlargements K reinforcing the impacting edges and giving weight to the projectile. In addition to the metal and consequent weight thus acquired, however, I substantially enlarge or elongate the ends of the projectiles intermediate of the forward and rear edges thereof, as shown at L to give a very substantial backing of metal

and resultant weight and force to the impact blow delivered by the edge of the projectile. This formation of the projectile from front to rear gives the same an approximately bell-shape.

From an inspection of Fig. 1 of the drawings it will be seen that by my special formation of the projectiles in so far as the widening of the same longitudinally of the machine is concerned, and the arrangement of the projectiles relative each other, the projectiles are laterally overlapped to a certain extent endwise of the machine so that the projectiles constitute in effect continuous breaking means longitudinally of the machine. Thus material when introduced into the machine will find it impossible to escape the action of the projectiles.

While I have herein disclosed one specific embodiment of the invention, it will be apparent to those skilled in the art that the same is capable of embodiment in other forms and devices than that shown.

As distinguished from the projectile enlarged in the line of its travel or "approximately bell shaped," as claimed herein, the broader idea of a projectile having angular, longitudinally disposed, relatively sharp forward and rear edges, with the laterally projecting enlargements, is disclosed and claimed in my co-pending application Serial No. 547379, filed March 4, 1910. Therefore such broader proposition will not be claimed herein.

I claim:

1. In a machine of the character described, a shaft, a plurality of projectiles, flexible connecting elements, and connections between said elements and the projectiles and the shaft, in combination with means for rotating the shaft and the projectiles, the projectiles being enlarged in the line of their travel and having an angular approximately radially disposed relatively sharp forward edge, substantially as and for the purpose described.

2. In a machine of the character described, a shaft, a plurality of projectiles, and flexible connections between the projectiles and the shaft, in combination with means for rotating the shaft and the projectiles, the projectiles being enlarged in the line of their travel and having an angular approximately radially disposed relatively sharp forward edge and also enlarged laterally of said edge to reinforce the same.

3. A projectile or hammer for a crushing or shattering mill of approximately bell shape from front to rear, the forward and rear portions being of angular formation to provide relatively sharp longitudinally disposed edges.

4. A projectile or hammer for a crushing or shattering mill having an enlarged outer end, an integral flattened inner end perforated to constitute a projecting eye and having the upper wall of the perforation curved, substantially as and for the purpose described.

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

MITTS QUENNER.

Witnesses:
D. A. RICHARDSON,
FRANK W. DOAN.