(No Model.)

J. H. & J. P. HOSIE.

COAL CRUSHING ROLLER.

No. 279,761. Patented June 19, 1883.

Fig. 1.

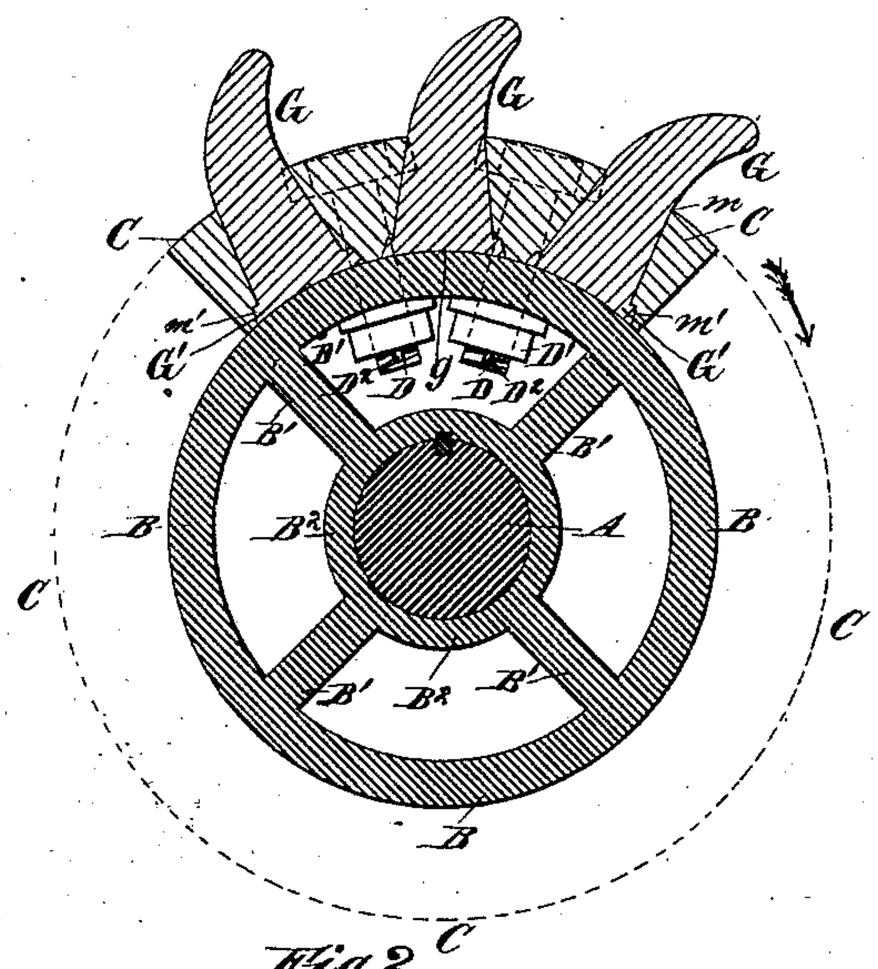


Fig. 2.

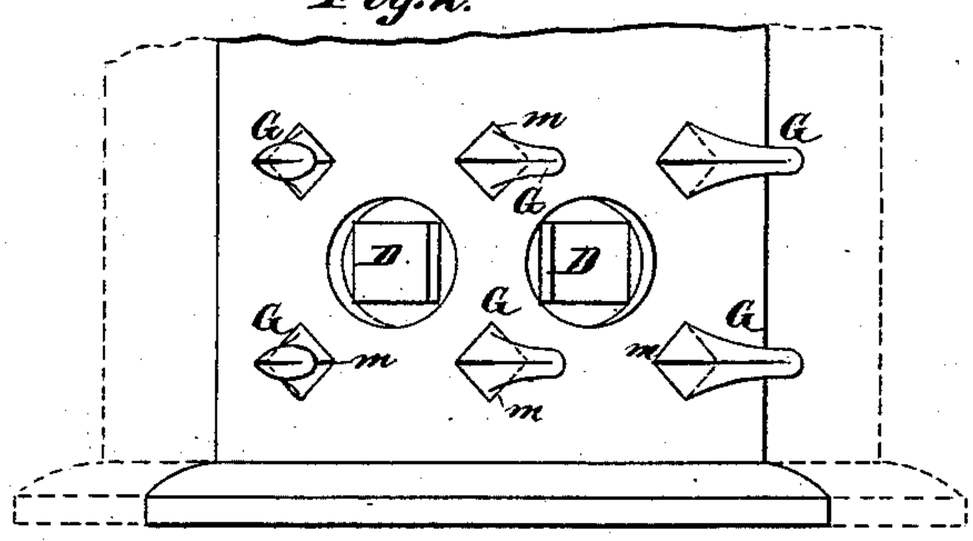
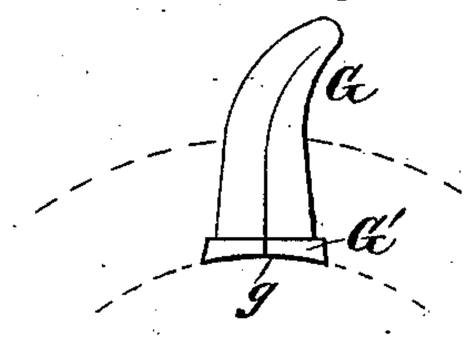


Fig. 3.



Witnesses

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Thomas D. Stetson.

UNITED STATES PATENT OFFICE.

JOHN H. HOSIE AND JAMES P. HOSIE, OF SCRANTON, PENNSYLVANIA.

COAL-CRUSHING ROLLER.

SPECIFICATION forming part of Letters Patent No. 279,761, dated June 19, 1883.

Application filed August 19, 1881. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. HOSIE and JAMES P. HOSIE, both of Scranton, Lackawanna county, in the State of Pennsylvania, have invented certain new and useful Improvements in Coal-Crushing Rollers, of which the following is a specification.

The invention relates to the general construction and combination, as will be hereinafter more clearly defined. We make the body of the roller with a smooth exterior and a hollow interior, providing only a sufficient number of properly-sized radial holes to receive the stout bolts which secure the thick segments on the exterior. These segments have rectangular holes tapering from the inside outward, receiving teeth with corresponding roots, inserted from the inside outward, and driven tightly home before the segments are applied on the main roller.

The accompanying drawings represent what we consider the best means of carrying out the invention.

Figure 1 is a cross-section of the roller with one of the segments and its teeth attached. Fig. 2 is a corresponding plan view. Fig. 3 is an elevation of one of the teeth detached.

Similar letters of reference indicate like parts in all the figures.

The drawings represent the novel parts with so much of the ordinary parts as is necessary to indicate their relation thereto.

We employ two breaking-rolls in each set. We can employ two or more sets in each machine, geared strongly together, as will be understood. A description of one will suffice for both or the whole.

A is the shaft, provided with suitable bearings and gear-wheel.

B is the main body of the roll, formed in one massive casting, or in two or more castings strongly and stiffly united to serve as one. It is hollow, and connected to the shaft by stout arms B′ and central boss, B^2, secured by keys or otherwise.

C C are segments of cast-iron or steel, adapted to fit closely on the exterior of the roll B, and provided with bolt-holes, matching similar bolt-holes in the roll, receiving stout bolts D, countersunk on the exterior and secured by nuts D′ and keys D^2 on the interior of the roll B.

In the segments C are cored or otherwise produced rectangular tapering apertures *m*, arranged, as shown, diamondwise to the motion of the cylinder, and tapering from the interior outward. Around each hole on the inner face is an enlargement or gain, *m′*.

G are teeth. They are inserted in the holes *m m′*, and are correspondingly tapered.

G′ is a flange around the base of the tooth, adapted to match in the gain or cavity *m′* in the segment C. The teeth are inserted from the interior of the segment and forced outward, each being fitted to fill its cavity *m m′* very perfectly, and afford a uniform and firm bearing over the whole surface. Each is forced into place by a movement from the interior outward. This may be effected by percussion with a heavy hammer on a suitable wooden block interposed to receive the blows; or we can force these into place by a hydraulic press or any other suitable means. The inner face, *g*, of each tooth being adapted to bear on the cylinder, and the teeth being forced home so as to bear very firmly, it follows that the tooth is supported very efficiently against all the strains in various directions to which it is subjected in breaking hard material, as anthracite. The great endwise strain is received by the direct pressure of the inner ends of the teeth against the cylindrical exterior of the roll B. The lateral strains in all directions are received by the tapering sides of the rectangular cavities in the segments. Torsional strains are very efficiently resisted by the forms of the parts. The segments are taken off and replaced without difficulty by reason that the teeth do not engage with the main cylinder, but only abut firmly thereon. The removal and replacing of the bolts with their nuts and keys, respectively, sets entirely free and again confines the segments. When a segment is removed, one or all of the teeth can be displaced by a sufficiently strong force—either percussive or constant—impressed in the direction to force the teeth inward.

The teeth may be repaired by an ordinary blacksmith.

Our improved rolls have great strength by.

the insertion of the teeth from the under side of each segment, the teeth being surrounded on all sides by the solid metal of the segment, applying closely and giving a firm support. The broad base *g*, abutting directly on the surface of the inner roll, receives the thrusting strain to better advantage than any construction of breaker-roll before known to us.

Our invention affords perfect security against the teeth being wrenched out of place, as each tooth has a flange which fits tightly into a counter offset or gain in the segment.

The teeth may be kept sharp from day to day with little labor and without requiring much skill. This is a very important point in practice, as much coal is wasted by being powdered by dull teeth.

The teeth may be of iron, simply pointed with steel, and hardened. The points of the teeth may be modified to any required extent by an ordinary blacksmith without changing or in any wise affecting the base portion by which each is supported. Our construction allows the teeth to be quickly and economically changed to suit any kind of work. The teeth, when set in place in the segments, have their bases level and even with the interior faces of the segments, and when the segments are placed upon the roller both the bases of the teeth and the inner faces of the segments lie against the surface of the roller. A solid roller is thus formed, and the teeth are held in the segments so tight by reason of their tapering holes that they will hold to the segments, and may be removed and replaced therewith.

Modifications may be made in the details. We can employ a greater or less number of segments and a greater or less number of teeth. The degree of taper of the teeth may be varied.

We do not esteem it absolutely essential to success that the teeth be placed diamondwise, as indicated. The segments may be additionally supported by resting with their edges in firm contact each with the adjacent segments on each side; but this is not essential.

We do not confine our invention to rolls adapted for breaking coal. They may be made of larger or smaller sizes and with teeth properly formed for breaking rock-salt, loaf-sugar, or any other material; but we esteem them especially adapted for coarse work, where the material is large and strong, as hard coal and some forms of iron ore and other ores.

We claim as our invention—

In a coal-breaker, the combination, with a plain cylinder or roller, of segments forming the exterior face thereof and provided with tapering holes, teeth of a tapering form inserted through the segments from the interior, and having their bases coincident with the inner faces of the segments, and securing means D D′, whereby the roller, bases of the teeth, and inner faces of the segments are in contact, substantially as set forth.

In testimony whereof we have hereunto set our hands, at New York city, this 13th day of August, 1881, in the presence of two subscribing witnesses.

JOHN H. HOSIE.
JAS. P. HOSIE.

Witnesses:
CHARLES R. SEARLE,
B. E. D. STAFFORD.