G. B. MARKLE.

Coal-Breaker.

No. 201,187. Patented March 12, 1878.

*Fig. 1.*

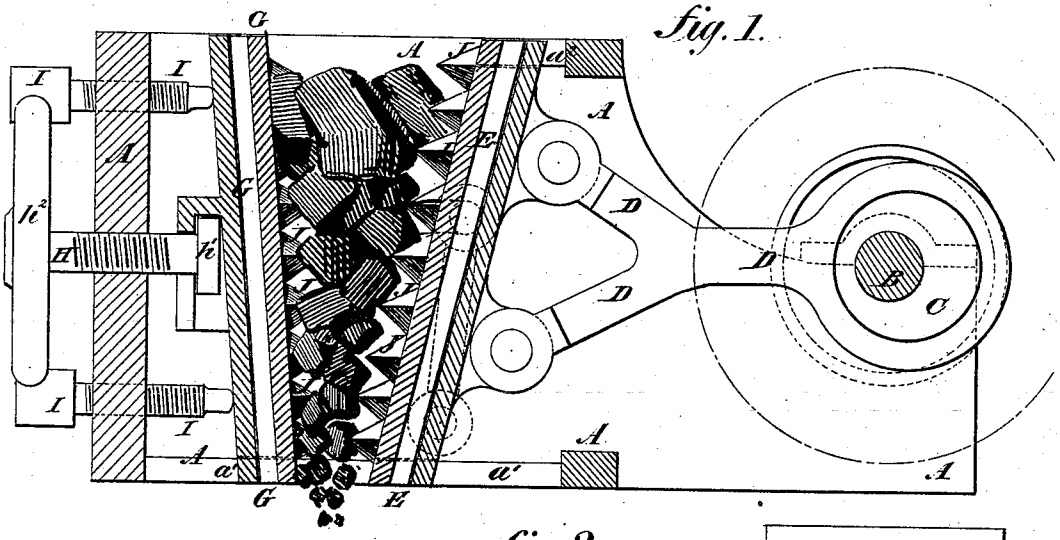
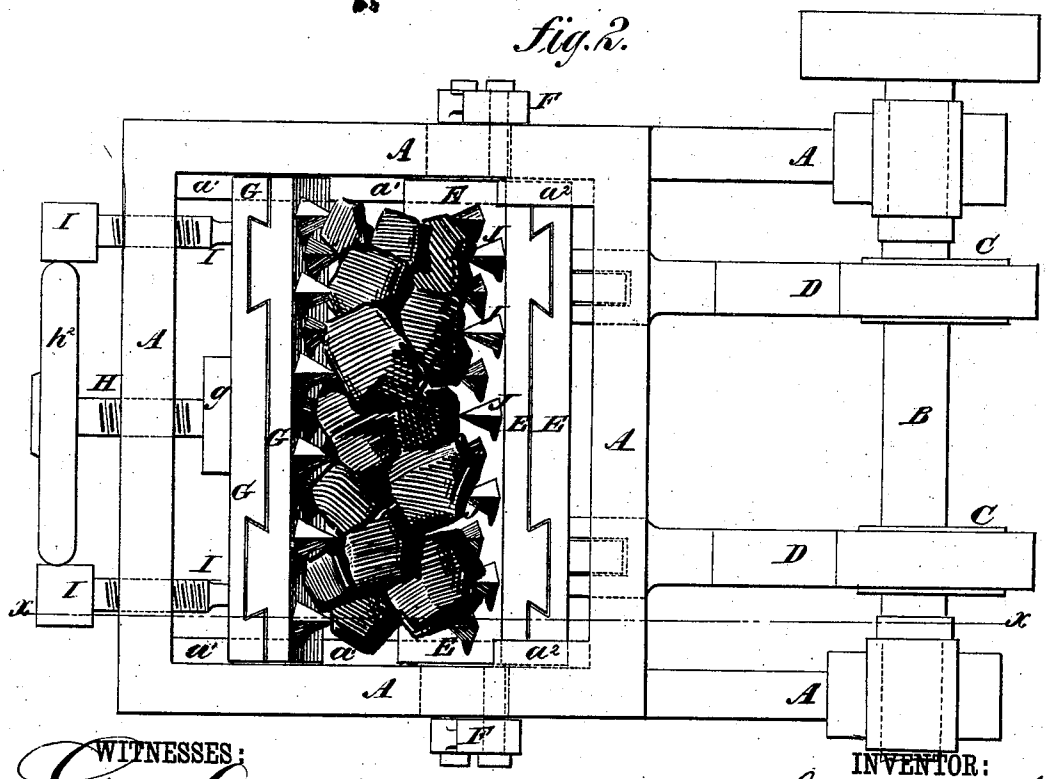



*Fig. 2.*




WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE B. MARKLE, OF JEDDO, PENNSYLVANIA.

## IMPROVEMENT IN COAL-BREAKERS.

Specification forming part of Letters Patent No. **201,187**, dated March 12, 1878; application filed December 1, 1877.

*To all whom it may concern:*

Be it known that I, GEORGE B. MARKLE, of Jeddo, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Improvement in Coal-Breaker, of which the following is a specification:

Figure 1 is a vertical longitudinal section of my improved breaker, taken through the line *x x*, Fig. 2. Fig. 2 is a top view of the same.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved machine for breaking coal, stones, and other similar substances, which shall be simple in construction, powerful in operation, and easily adjusted to break the material to any desired fineness.

The invention consists in the breaker-plates, each made in two parts, connected together by dovetailed tongues and grooves, to enable the inner parts, to which the teeth are attached, to be readily removed; in the combination of the eccentrics or cranks and the forked arms with the breaker-plate, the box or frame, and the shaft; and in the combination of the swiveled screw and the set-screws with the breaker-plate and the box or frame, as hereinafter fully described.

A is a strong and heavy iron box or frame, made with close sides and forward end, and with open top, bottom, and rear end. The sides of the box or frame A project to the rearward, and have their upper parts cut away, to receive the bearings for the shaft B. Power may be applied to the shaft B by a band and pulleys, or by other suitable gearing.

To the shaft B are attached eccentrics or cranks C, one or more, (but preferably two,) to which are attached the ends of arms D by eccentric-straps or other suitable means. The other ends of the arms D are forked, and the ends of the branches thus formed are pivoted to the breaker-plate E. The upper one of the branches of the arms D is made shorter than the lower one, to give an inclination to the said plate E.

The lower corners of the plate E are notched to fit and slide upon flanges $a^1$ formed upon the inner side of the lower edge of the sides of the box or frame A. The upper corners of the plate E are notched to receive and fit upon the short flanges $a^2$ formed upon the inner side of the upper edges of the rear part of the sides of the box or frame A.

F are two upright arms, placed at the outer side of the sides of the box or frame A, and pivoted at their lower ends to the lower parts of said sides. To the upper ends of the arms F are attached, or upon them are formed, pivots, which pass through curved slots in the sides of the box or frame A, and work in bearings formed in or attached to the ends of the breaker-plate E. By this construction the arms F support the weight of the plate E as it moves forward and back, to diminish the friction between the said plate E and the flanges $a^1$, and prevent the wear of said parts.

G is the forward breaker-plate, the lower corners of which are notched to fit upon the flanges $a^1$. To the middle part of the outer side of the plate G is attached, or upon it is formed, a projection, *g*, which has a dovetailed groove formed in it, leading up from its lower side, to receive the head $h^1$ formed upon or attached to the forward end of the screw H to swivel the said plate to, and enable it to be moved forward and back by the said screw. The screw H passes through a screw-hole in the middle part of the forward end plate of the box or frame A, and has a hand-wheel, $h^2$, attached to its outer end, for convenience in operating it.

I are four set-screws, which pass through the forward end plate of the box or frame A, and the forward ends of which rest against the breaker-plate G, near its four corners, to support it firmly in position when adjusted. The screws H I enable the plate G to be adjusted nearer to or farther from the point to which the plate E advances, and to be adjusted at any desired inclination, so that the coal may be broken finer or coarser, as may be desired.

The plates E G are made in two parts, secured to each other by dovetailed tongues formed upon one of said parts, and fitting into dovetailed grooves formed in the outer part, as shown in Fig. 2. J are the teeth, which are formed upon or attached to the inner parts of the plates E G, and which may be made of steel or of cast-iron, with hardened points. With this construction, should any of the teeth J wear out or be broken, the inner parts of the

said plates may be readily taken out and the teeth repaired or replaced, or the said parts may be replaced with new ones. By this construction, and by having a second set of teeth-plates always at hand, the breaker need not be stopped more than a few minutes to repair broken teeth.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the eccentrics or cranks C and the forked arms D with the breaker-plate E, the box or frame A, and the shaft B, substantially as herein shown and described.

2. The combination of the swiveled screw H and the set-screws I with the breaker-plates G and the box or frame A, substantially as herein shown and described.

GEORGE B. MARKLE.

Witnesses:
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CHAS. N. WALKER.