

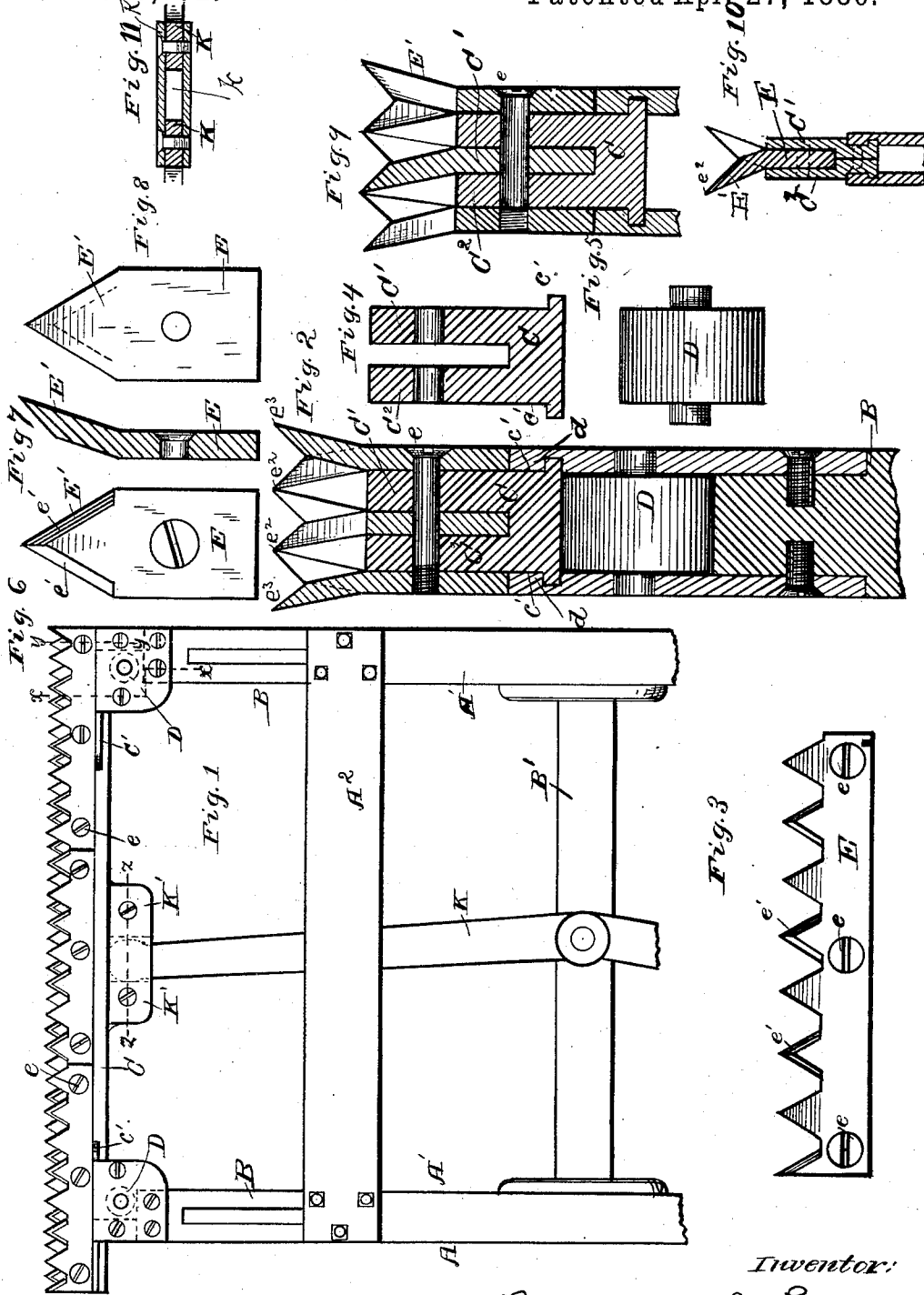
(No Model.)

B. A. LEGG.

CUTTER FOR MINING AND OTHER MACHINES.

No. 340,792.

Patented Apr. 27, 1886.



Witnesses:

J. C. Turner
P. V. Sommers

Inventor:
Benjamin A. Legg
by Doubleday & Bliss
attys

UNITED STATES PATENT OFFICE

BENJAMIN A. LEGG, OF COLUMBUS, OHIO, ASSIGNOR TO JOSEPH ANDREW JEFFREY, OF SAME PLACE.

CUTTER FOR MINING AND OTHER MACHINES.

SPECIFICATION forming part of Letters Patent No. 340,792, dated April 27, 1886.

Application filed September 22, 1885. Serial No. 177,837. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN A. LEGG, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Cutters for Mining and other Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in cutters adapted for use in machines employed in mining or cutting rock and coal and for other purposes, it relating also to an improved cutter-bar adapted to receive and carry cutters of my improved character, although the latter may be used with bars differently constructed or operating in somewhat different ways.

Figure 1 is a top plan view of a sufficient portion of a machine to illustrate the manner of applying thereto cutters of my improved style. Fig. 2 is a section on the line $x x$ on an enlarged scale. Fig. 3 shows one of the cutter-sections detached in top plan view. Fig. 4 is a section of the cutter-bar detached. Fig. 5 is a face view of one of the anti-friction rollers detached. Figs. 6, 7, and 8 are respectively a bottom view, a longitudinal section, and a top view of a cutter of a modified form in so far as each cutting part proper is formed independently of the others. Fig. 9 is a section on line $y y$, Fig. 1. Fig. 10 shows a modified cutter-bar. Fig. 11 is a section on line $z z$, Fig. 1.

In the drawings I have shown some of the parts of a mining-machine in order to clearly set forth the relation therewith of the cutters and the cutter-bar; but it will be understood that the parts essentially pertinent to this case may be employed with constructions of a different character and for different purposes.

In order that one form of mining-machine, more or less complete, may be fully understood, reference can be made to my Patent No. 299,655, June 3, 1884, wherein use is made of a revolving cutter-bar, instead of reciprocating cutters.

In the accompanying drawings, A represents a portion of a stationary frame, with side bars, A' , and girts, as at A^2 , on which frame

slides a movable frame having bars B B and cross-bars B' . These two frames may be united in any of the ways well known, and any preferred mechanism can be employed to move the one relatively to the other.

c represents the cutter-bar, which is supported at one end of the sliding frame in such way that it can freely reciprocate transversely to the path of said frame. The cutter may be attached to the frame in any suitable way. As shown, it has grooves or ways at c' formed in it upon the upper and lower faces respectively, and into these grooves there fit tongues d , carried by the sliding frame. Behind the bar C there are anti-friction rollers D. The cutter-bar is reciprocated by means of a lever, K, operated by an engine or in any other suitable way.

From the front side of the bar C project the cutters. Although it is possible to form these in any of a number of shapes so as to accomplish the ends at which I aim, yet I prefer to construct and arrange them substantially as shown, so as to produce a kerf whose vertical dimensions shall be greater than that of the cutter-bar and of the sliding frame, and in which kerf these latter parts can move without obstruction. Several of the cutters proper, E' , can be constructed integral with the main supporting-plate E, as in Fig. 3, or they may be made with separate carrying-plates, as in Figs. 6, 7, and 8. The plate or bar E is arranged horizontally in a machine of the character shown, and the part E' is inclined relatively thereto.

By referring to Fig. 1 it will be seen that three of the plates or cutter-sections E' are used, they being so situated as to extend across the machine.

To receive the parts E, recesses, rabbets, grooves, or apertures are formed in the cutter-bar C. As shown, there is a rabbet in the upper face of the bar, and another in the lower face, and a groove in the front face about midway between the aforesaid rabbets, as clearly shown in Fig. 4. Into these rabbets or grooves the parts E of the cutters are placed and after being put properly in position they are fastened by means of screws or bolts, as shown at e . The edges of the cutters are bev-

eled, as shown at e' , the bevels of one lying upward, while those of the adjacent cutters face downward.

By referring to Fig. 2 it will be seen that the cutters of one series are so arranged with relation to those of the adjacent series that the points shall be in or nearly in the same transverse lines, the result being that a clear kerf is cut in front of the sliding frame.

It will be seen that the upper cutting-edges project to or above the top plane of the carrier, and the corresponding edges of the lower cutters project to or beyond the bottom plane thereof, and that the operative edges of the intermediate cutters are so related as to remove all the wall lying between the extreme cutting-points.

In Fig. 2, e^1 e^2 indicate the highest and lowest cutting-points, and e^3 the points of the intermediate cutters which come into conjunction.

Instead of having three series of cutters on three lines transversely of a cutter bar or holder, use may be made of any suitable number of series, according to the character of the material and the depth of kerf which it is desired to produce. Where a shallow kerf is wanted, a single transverse series can be used, either secured to the upper or lower side of a bar, if the parts E' be long enough and be inclined properly to produce a kerf sufficient to allow the carrying parts to move therein; or, a single series of them may be fastened in place by means of a chamber or recess in the front edge of the cutter bar or holder, as shown in Fig. 10, which also illustrates the fact that the cutter-bar C can be made of several pieces secured together, the upper part being shown at C' , and the lower at C^2 , these corresponding to the parts C' and C^2 in Figs. 2, 4, and 9.

I am led to believe that for the purposes of mining ordinary coal, three series arranged substantially as shown in Figs. 2 and 9 is the preferable construction.

As shown, the teeth of each series are alternately inclined—that is to say, each alternate one is turned upward and the others downward; but more or less of the same effect can be attained if another system be followed in inclining them, so long as enough are turned in each direction to insure that the whole face of opposing material shall be traversed by one or more cutting-edges.

The cutter-bar carries the devices by means of which power is applied to it and to the cutters. The lever K has its end seated in a chamber or recess at k between a backward-projecting plate, K , and top and bottom plates, K' , bolted to the former.

I am aware of the fact that reciprocating cutting devices have been employed for various purposes in which the power was applied at the ends of the bar, the cutters being inclined in opposite directions for the purpose of forming a wide path; but I believe myself to be the first to have so constructed and arranged the parts as to make them suffi-

ciently operative for mining purposes by constructing the bar so that power can be applied to it at a central point and supporting it at the ends. Of course the exact location for attaching the power-transmitter may be more or less varied.

What I claim is—

1. The combination, with the cutter bar or holder, of the separately-formed cutters secured to the bar and arranged on two or more lines longitudinally of said bar or holder, and having serrated operative portions with teeth inclined some upward and some downward, substantially as set forth.

2. The combination, with the cutter bar or holder, of a series of detachable cutters secured to said bar or holder, the cutting plates or teeth proper being inclined alternately in opposite directions, and the supporting or fastening parts being arranged on a common line, substantially as described.

3. The combination, with the cutter bar or holder, of a series of cutters formed separately from said bar and secured thereto on a longitudinal line, and a second series of separately-formed cutters secured to the cutter-bar on a longitudinal line other than that of the first aforesaid series, some of the teeth of each series being inclined toward the cutters of the other series, substantially as set forth, whereby their cutting-edges are brought into conjunction, as described.

4. The combination of the cutters lying in front of the non-cutting parts, a reciprocating bar carrying said cutters and provided with a guide formed on or secured to said bar, whereby it is held in place on its support, substantially as set forth.

5. The combination of the cutters lying in front of the non-cutting parts, and the reciprocating bar carrying said cutters and provided with a guide which is situated directly behind the cutters, substantially as set forth.

6. The herein-described detachable cutter, having a part, E , for securing it, and a cutting portion, E' , inclined to the part E and provided with two cutting-edges, substantially as described.

7. The combination, with the cutter-bar, of the separately-formed cutters, each having bevels upon one of its faces, the bevels of some teeth lying upward and those of others lying downward, substantially as set forth.

8. The combination of the cutter-supports C' , the separately-formed cutters secured to the face of said support and having the cutting-teeth inclined some in one direction relative to the path of advance and some in the other direction, substantially as set forth.

9. The combination, with the cutter-bar having a chamber or recess therein, of the cutters secured in said chamber or recess, and the cutters secured to the outside of the bar, substantially as set forth.

10. The combination of a cutter bar or holder, means for reciprocating said bar in both directions across the path of advance of

the machine, said bar having the parts C' and the part C² with a chamber or recess between them, and cutters inserted into said chamber or recess, and adapted, substantially as set forth, to cut the material while moving in either direction, as described.

11. The combination, with a reciprocating cutter bar or holder having the part C' and the part C² with a chamber or recess between them, of the cutters inserted into said recess, and arranged, substantially as set forth, to have a cutting-edge above said parts C' C² and a cutting-edge below them, substantially as set forth.

12. The combination, with the cutter-bar, the devices carried by the said bar at or near the center thereof for connecting the power-transmitting mechanism, of the cutters pro-

jecting forward from said bar, and being alternately inclined oppositely with relation to the path of advance, substantially as set forth.

13. The combination, with the cutter bar or holder, of two or more series of cutters, each series being composed of several sections, and each section having several teeth and a common bar or plate, whereby they can all be detached from the aforesaid cutter bar or holder together and can be secured thereto together, substantially as set forth.

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

BENJAMIN A. LEGG.

Witnesses:

W. T. McCLURE,

T. M. LIVESAY.