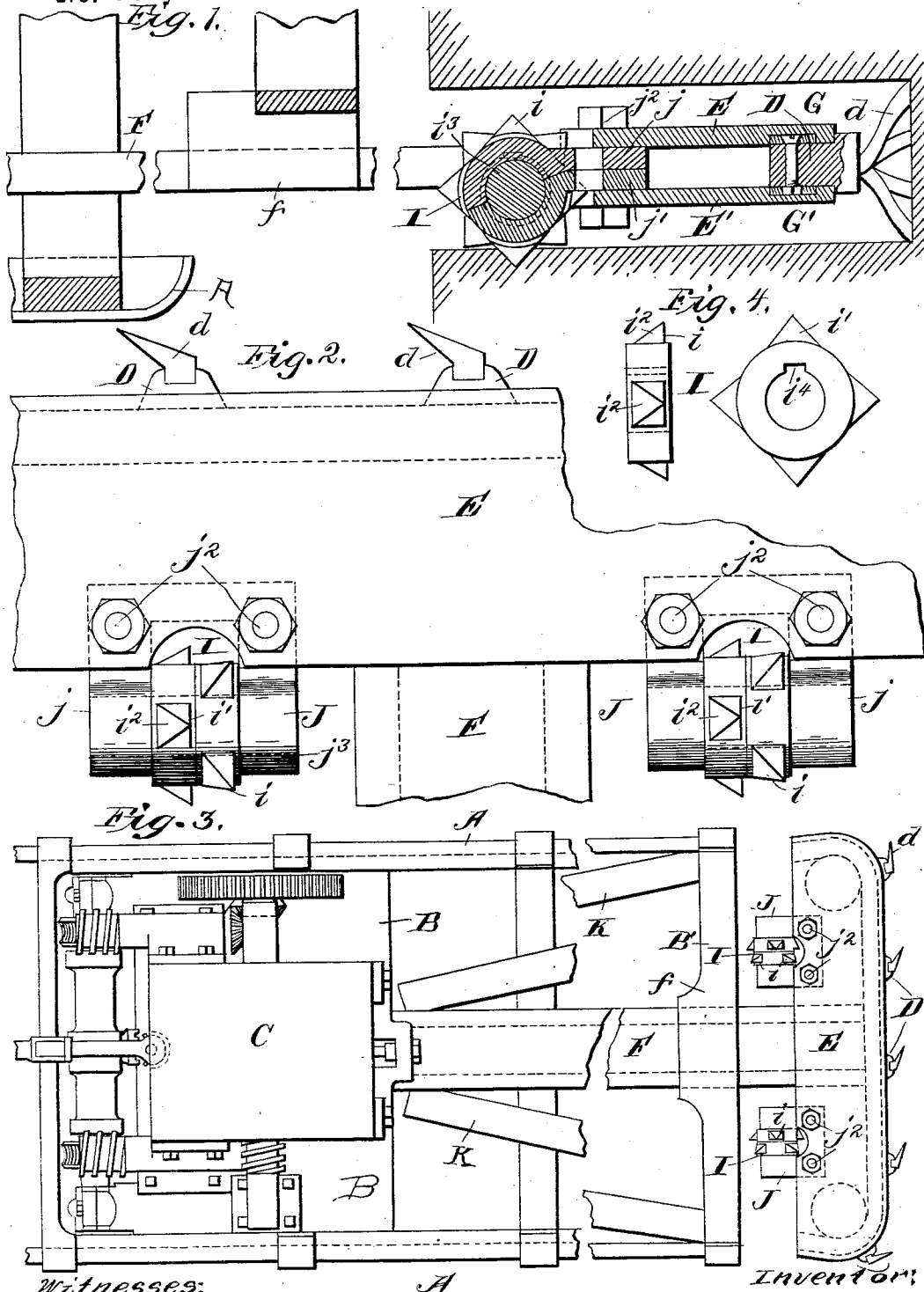


(No Model.)

H. H. BLISS.
MINING MACHINE.

No. 588,051.

Patented Aug. 10, 1897.



Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY H. BLISS, OF WASHINGTON, DISTRICT OF COLUMBIA.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 588,051, dated August 10, 1897.

Original application filed April 28, 1894, Serial No. 509,419. Renewed October 14, 1896, Serial No. 608,889. Divided and this application filed October 22, 1896. Serial No. 609,747. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. BLISS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Mining-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a longitudinal vertical section through a portion of a mining-machine, illustrating the manner of applying my improvements. Fig. 2 is a top plan view of the same. Fig. 3 is a top plan view of a complete machine, showing my improvements applied thereto. Fig. 4 is a detail view illustrating in edge view and side elevation the rotary toothed holder.

In the drawings a bed-frame and a carriage are shown which are more or less similar to others heretofore used, the side parts of the bed being indicated by A and the carriage by B. On the rear part of the latter is mounted the motor or engine C, having gearing for effecting the movement of the chain D with the cutters *d*, and also gearing for effecting the advance of the carriage and the cutting apparatus.

The front part of the cutting apparatus is supported on one or more cross-bars E, secured to one or more longitudinal bars F. As shown, there is a single central longitudinal bar F, passing through a guide at *f*, secured to one of the cross-bars B' of the bed.

The cutters *d* are so arranged as to form a kerf, having a part G above the carriage and a part G' below the same.

From the above description and the drawings it will be seen that as the carriage and cutting apparatus are advanced the front end thereof is supported solely by the cutters *d* when only the parts above described are employed. This tends to cause a cramping or binding of the carriage in the bed, and also as the cutters move through the coal under the power communicated to them through the

endless chain D they exert a reactionary thrust in the direction opposite to that in which they are moving. This thrust is frequently so great as to not only cause a straining of the parts of the framework, but also to cause more or less of the machine to move bodily in said direction, opposite to the direction of movement of the cutters. I overcome the difficulties incident to this fact by placing a support below the front end of the carriage, which engages with the floor of the cut sufficiently to prevent the cutting apparatus moving laterally by reason of the thrust of the chain. I am aware that a sliding shoe at this point is not novel, and in an earlier application, Serial No. 509,419, filed April 28, 1894, from which the subject-matter of the present case is withdrawn, I have illustrated and described a support of that general style. In the embodiment of my invention herein illustrated this support is of the nature of a toothed roller, there being two of such supports shown, one on each side of the center of the machine. These rollers or wheels I are preferably made in the form of washers or disks, having teeth *i*, which project on radial lines in such way that they can be placed to have the teeth of the one follow those of the others. The teeth have each a vertical face *i'* on one side and on the other side inclined faces *i''*, so that they can readily penetrate the adjacent horizontal wall of the kerf cut by the cutters *d* on the endless chain, and the vertical sides *i'* will engage with the walls of the apertures produced by the points.

The disks composing each toothed holding wheel or roller are mounted on shafts or bars *i''*, which in turn are mounted in a carrier J, attached to the front cross-head of the carriage.

The carrier J is shown as made up of two parts *j, j'*, secured together and to the bars or plates E of the front cross-head of the carriage, between which plates the said parts *j, j'* extend, by bolts *j''*. Thus each part *j, j'* of the carrier J is arranged to provide a bearing or boxing *j''*, the plane of separation of said two parts passing through the axis and being inclined to the flat part of the carrier, so as to permit the shaft to be readily taken out of the bearings. The washers or disks composing each

wheel or roller I are keyed together, each of said washers being provided with a groove or recess I⁴ to receive a fastening-key.

The rollers I are so arranged that at all times one or more of the teeth shall be in engagement with the floor, said wheels or rollers revolving as the carriage and cutting apparatus are advanced.

The motor and the gearing actuated thereby for moving the chain and for advancing and withdrawing the carriage, the chain-guide K, and other parts of the machine illustrated are not herein described in detail, they being of the now well-known form used in machines constructed by H. B. Dierdorff.

I do not claim herein, broadly, the combination, with the carriage of a chain-cutter mining-machine, of a frame-support below the front end of the carriage and adapted to ride on the floor of the cut to hold the front end of the carriage in proper horizontal lines and provided with means which penetrate the said floor and prevent lateral motion of the frame, preferring to claim such matter in my earlier application, hereinbefore referred to, Serial No. 509,419, filed April 28, 1894, from which the present subject-matter is withdrawn; but there are certain features of advantage possessed by such a form of holder or carriage supporting and steadying device as that presented herein to which the present claims are limited. Nor do I claim in a machine of the class described the combination, with a suitable carriage, of devices arranged upon the same to cut a kerf into which the carriage may advance, means for forcing the carriage forward in the kerf, a wheel revolubly mounted in the carriage in position to project from one broader face only of the carriage and bite into the adjacent kerf-wall as the carriage advances, and a second wheel arranged to bite the opposite kerf-wall in a similar manner.

What I claim is—

1. In a machine of the class described, the combination with a suitable carriage, of devices arranged, upon the carriage, to cut a kerf into which the carriage may advance, means for forcing the carriage into the kerf so cut, and a wheel revolubly mounted upon the carriage and arranged to bite into one, only, of the kerf's broader walls as the carriage is forced forward.

2. In a mining-machine adapted to form a kerf or cut, the combination with a carriage adapted to advance into the kerf and suitable cutting mechanism for forming the kerf in advance of the carriage, of a toothed wheel mounted on the carriage and free to rotate in a plane approximately perpendicular to the carriage and approximately parallel to the line of motion thereof, the teeth of the wheel

being adapted to embed themselves successively in one of the walls of the kerf as the wheel is rotated by its contact with said wall and the forward motion of the carriage.

3. In a mining-machine adapted to form a kerf or cut, the combination with a carriage adapted to advance into the kerf, and suitable cutting mechanism for forming the kerf in advance of the carriage, of a series of toothed wheels mounted on the carriage and free to rotate in a plane approximately perpendicular to the carriage and approximately parallel to the line of motion thereof, the teeth of the wheels being adapted to embed themselves successively in one of the walls of the kerf as the wheels are rotated by their contact with said wall and the forward motion of the carriage.

4. In a mining-machine of the class described, the combination with the head, E, and the cutting-chain, D, adapted to form a kerf in advance of said cutting-head, of a series of guiding-wheels, I, journaled in said head, the teeth of said wheels being adapted to embed themselves successively in one of the faces of the kerf as they are rotated by their contact with said wall and the forward motion of the head, E.

5. In a mining-machine, the combination of a bed-frame, a carriage fitted in guides on the bed and having a central longitudinal push-bar, a chain, carrying a series of cutters, supported on said carriage, means for moving the carriage longitudinally of the bed, and two revoluble toothed wheels or rollers journaled in bearings on the carriage on opposite sides of the said central push-bar, the points of each of said wheels being adapted to engage with one of the horizontal walls of the kerf formed by the cutters on the chain, substantially as set forth.

6. In a mining-machine, the combination with the bed, the sliding carriage thereon, the cutter-carrying chain on the carriage, and means for moving the carriage longitudinally of the bed, of a revoluble holder or steadying device journaled in bearings on the carriage and consisting of two or more disks or washers having radially-projecting teeth, and a pin or key connecting said washers together, the teeth on said holder being adapted to engage with a horizontal wall of the kerf formed by the cutters on the carriage as the carriage is moved longitudinally of the bed, substantially as set forth.

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

HENRY H. BLISS.

Witnesses:

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