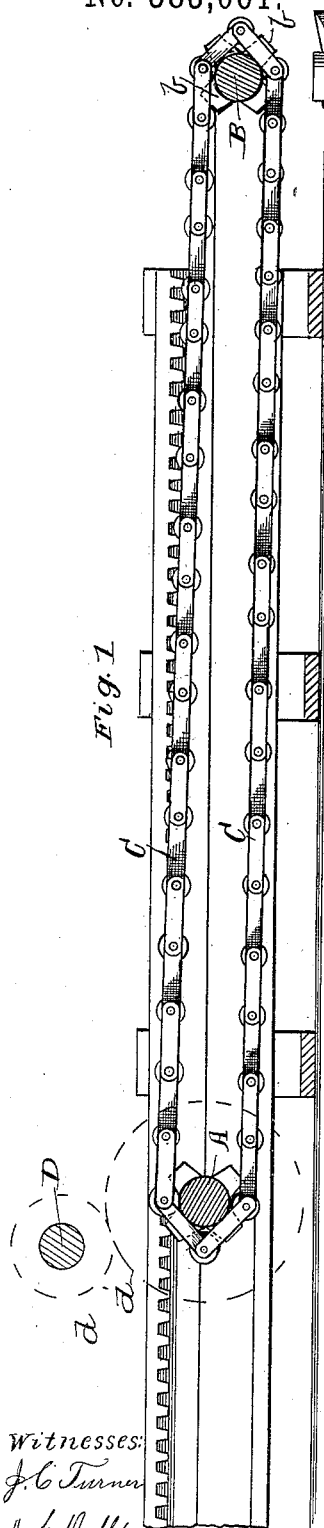


(No Model.)

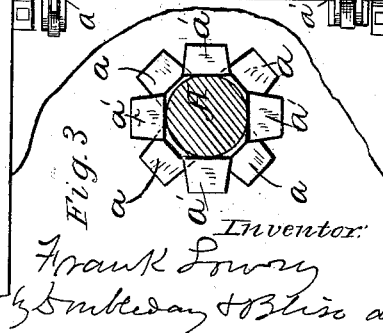
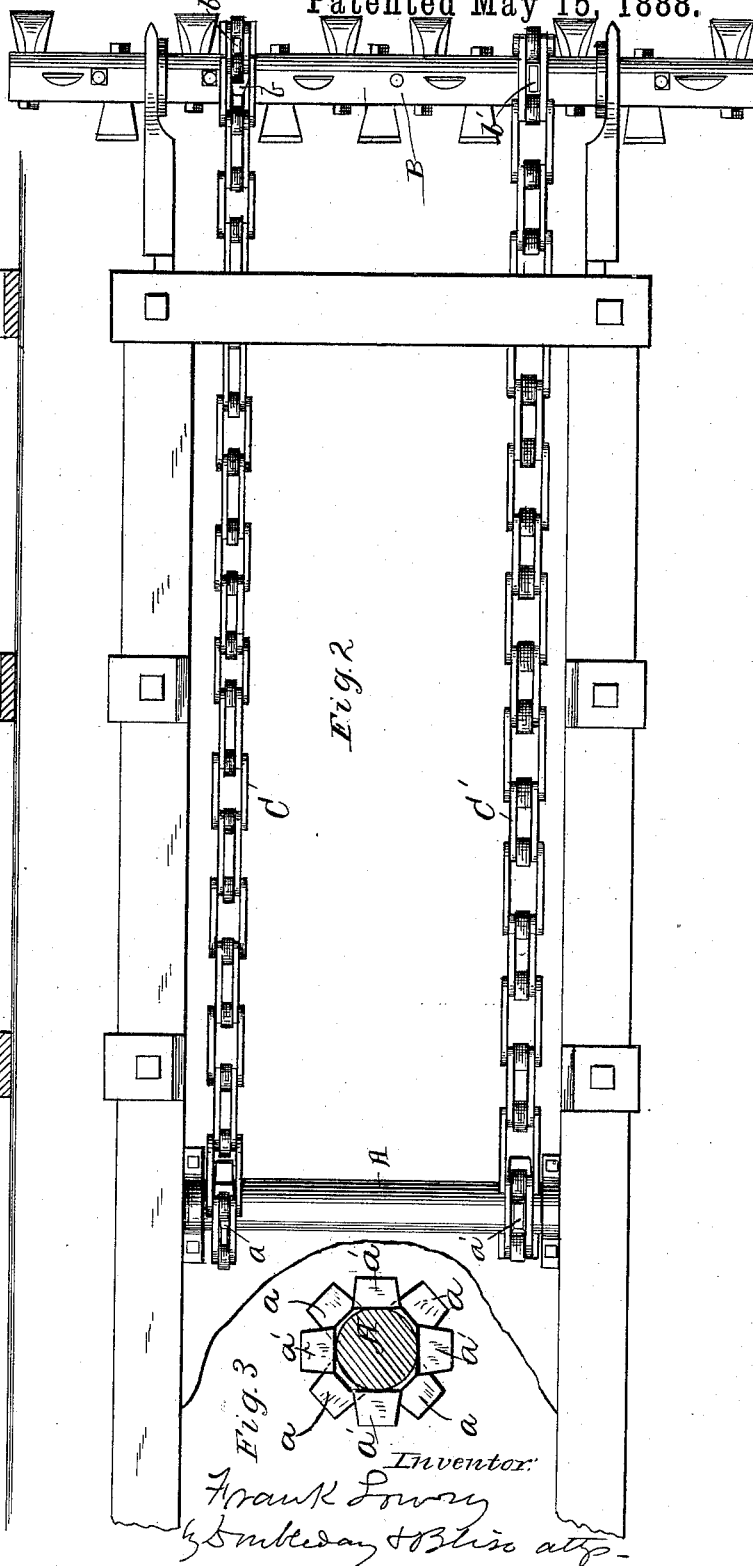
F. LOWRY.
MINING MACHINE.

No. 383,061.

Patented May 15, 1888.



Witnesses:
J. C. Turner
J. de Soubert



UNITED STATES PATENT OFFICE.

FRANK LOWRY, OF COLUMBUS, OHIO, ASSIGNOR TO THE LECHNER MANUFACTURING COMPANY, OF SAME PLACE.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 383,061, dated May 15, 1888.

Application filed May 27, 1887. Serial No. 239,546. (No model.)

To all whom it may concern:

Be it known that I, FRANK LOWRY, 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 Mining-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in mining-machines of that class in which use is made of a chain for driving a bar carrying cutters. In some of such machines the chain has been passed around and engaged directly with the cutter-bar, and in others the cutter-bar has not been engaged directly, but use has been made of a supplementary chain bar or shaft connected to the cutter-bar by gearing. In all the machines of this character the power has been transmitted by the chains at a disadvantage, as no provision has been made for insuring that the power should be uniformly transmitted to the cutter-bar at all parts of its revolution. Generally use has been made of two or more chains running from a chain shaft driven by an engine forward either to the cutter-bar directly or to a supplementary shaft, as aforesaid; and the sprocket-wheels for both of the said chains have been so arranged as to have their teeth on the same lines relatively to the axes of the driving and of the driven shafts. As a result, it has been found that the motion is transmitted unevenly—that is to say, in such way that there are times of greater application of power and times of less application.

The object of this invention is to overcome this, and it is done by so arranging the chains and the sprockets that one chain shall apply the maximum power at one part of the rotation of the revolving shafts and the other chain apply its maximum at another time.

The invention can be carried out in any one of numerous ways, and I do not wish to be limited to the construction shown.

In the drawings, Figure 1 is a longitudinal section of as much of a mining-machine as is necessary to embody the invention. Fig. 2 is a top plan view. Fig. 3 is a cross-section of the rear or driving-chain shaft, which figure shows, also, the relations of the teeth of the

several sets on the front bar or shaft—that is, the one driven by the chains.

I have, for sake of illustration, selected such parts of well-known mining-machines as are sufficient to give a full understanding of the present invention. For an understanding of all of the details of a complete machine reference may be made to patent to B. A. Legg, No. 299,655, dated June 4, 1884; but I do not limit the invention to any particular form of mining-machine, as a large number are now well known, to any one of which the invention can be applied for the purpose of imparting power to the cutting mechanism.

In the drawings, A represents the power-shaft—that is, a shaft that receives the power from the engine—and B the driven shaft or bar, the latter in the construction shown being the bar which directly carries the cutters. The power may be imparted to shaft A by any suitable mechanism, power devices being indicated in Fig. 1, comprising a shaft, B, and gearing. (Shown in dotted lines at *d d'*.) Upon it are formed or to it are attached two sprocket-wheels or two sets of sprocket-teeth, one being shown at *a* and the other at *a'*. The shaft or bar B is formed or provided with corresponding wheels or teeth at *b* and *b'*. From an examination of Fig. 1 it will be seen that the teeth *a a'* are not in the same axial planes. The teeth in each set are arranged about ninety degrees apart, and those at *a* are respectively in longitudinal axial planes midway between the planes of the teeth *a'*. The sets of teeth *b b'* on the bar B are similarly arranged in relation to each other.

C C' represent the chains passing from the teeth at *a a'* to those at *b b'*, these, as shown, being formed of links of similar character and size; and by reason of the above-described arrangement of the teeth the links of one chain are somewhat in advance of those of the other,

When the parts are arranged in the way described, the power is applied to the driven shaft or bar uniformly, the times of maximum application of one chain being intermediate of the corresponding times of the other chain. In this way an end is reached more or less analogous to that attained by the ordinary arrangement of engines in respect to the crank-

shaft, by which arrangement the "dead-center" is overcome.

As above indicated, the same object can be reached in other ways so long as chains of substantially the character shown and described are interposed between the engine or the power devices and the cutter-bar, whether interposed directly or indirectly. In fact, the invention can be applied even in still other forms than of mining-machines, as shown, so long as it is made of two sets of intermittingly-acting power-transmitting devices interposed between the cutting mechanism proper and the power devices, if the said two sets of devices are so arranged as to alternately apply the maximum of their power.

What I claim is—

1. In a machine for cutting coal or rock, the combination, with the power devices and the cutter-bar, of a chain interposed between the said power devices and the cutter-bar, and the teeth *b b'*, arranged, substantially as set forth, in different axial planes, as described.

2. In a mining-machine, the combination, with the power devices and the cutter-bar, of the chains interposed between the power devices and the cutter-bar, and arranged, substantially as set forth, with the links of one chain out of line transversely with the links of the other chain, as described.

3. The combination, with the power devices and the chains adapted to transmit power, of the chain-driving shaft having two sets of teeth, the teeth of one set being out of the lines of the teeth of the other set, and a shaft driven by the said chain, having two sets of teeth correspondingly out of line, substantially as described.

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

FRANK LOWRY.

Witnesses:

JAMES WATSON,
T. M. LIVESAY.