

(No Model.)

F. M. LECHNER.
MINING MACHINE.

No. 569,758.

Patented Oct. 20, 1896.

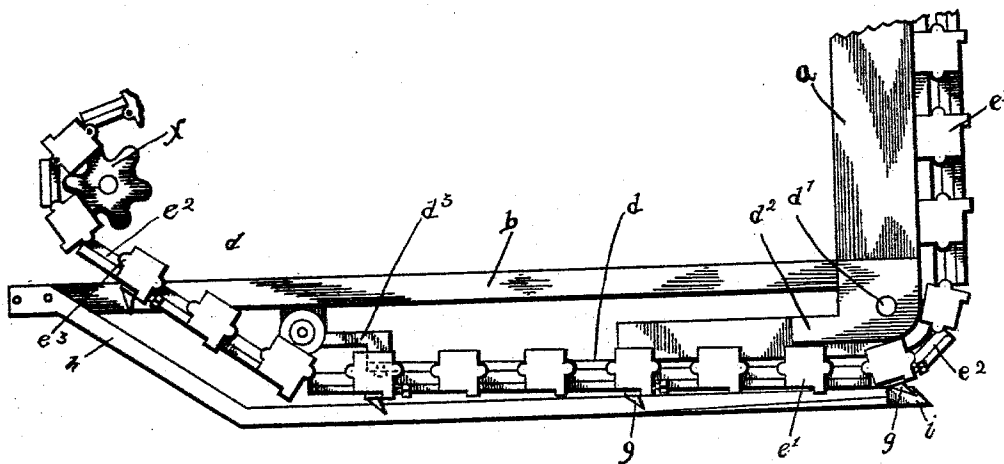


Fig 1

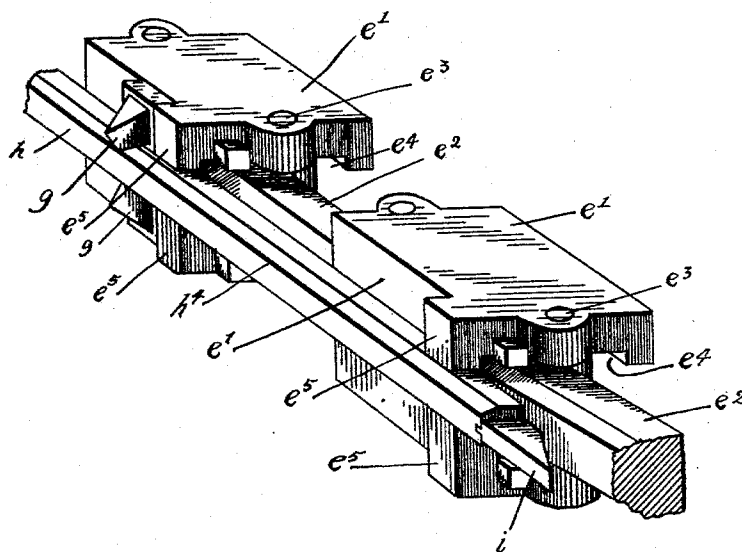


Fig 2

WITNESSES:

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MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 569,758, dated October 20, 1896.

Application filed July 27, 1896. Serial No. 600,644. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS M. LECHNER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Mining-Machines, of which the following is a specification.

My invention relates to the improvement of mining-machines, and has particular relation to the improvement of holding devices therefor.

The objects of my invention are to provide a mining-machine of that class which employs chain cutters with an improved form of laterally-arranged holding-bar, which is adapted by contact with the coal or other material in which the machine is operating to prevent the lateral thrust of the machine which is caused by the resistance which the coal or other material offers to the cutters, and to produce other improvements in details of construction and arrangement of parts, which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a portion of a mining-machine having my improvement thereon; and Fig. 2 is a detail view in perspective of a portion of an endless cutting-chain, showing my improved holding-bar in connection therewith.

Similar letters refer to similar parts throughout the views.

The general character of mining-machine upon which my invention is employed is so well known as not to necessitate a detail description of its construction and operation, and for that reason I have shown in the accompanying drawings but a portion of a mining-machine frame and cutting-chain of the class mentioned.

a represents the forward end plate of the sliding frame of a mining-machine, and *b* represents one of the longitudinal sliding-frame bars, which extends rearwardly from said end plate *a* in the usual manner. *c* represents one of the rear cross frame-bars, and *d* a longitudinally-arranged guide-bar which extends in a slightly-inclined line on the outer side of the bar *b*.

d' represents the shaft or journal of one of

the corner sprocket-wheels, which is journaled between the usual frame-plates *d*².

As indicated at *d*³, a brace or supporting-arm is provided, which connects the rear portion of the guide-bar *d* with the rear portion of the sliding frame.

In the form of mining-machine to which my invention applies an endless cutting-chain *e* is employed, consisting of alternately-arranged tool holding and connecting links *e'* and *e*², these links being jointedly connected, as indicated at *e*³. The endless chain thus formed passes about a rear sprocket-wheel *f*, mounted on the sliding frame, to which motion is contributed in the usual manner. The forward portion of the chain passes about the usual sprocket-wheels at the front corners of the frame, which are carried by the shafts or journals *d'* between the plates *d*². The chain also travels against guide-rollers *d*⁴, mounted on the cross-bar *c*.

The character of tool-holding links which I employ in the construction of the cutting-chain is illustrated more fully in Fig. 2 of the drawings, each of these links being provided on their inner sides with substantially T-shaped horizontal recesses or grooves *e*⁴, this form of link being shown more specifically in my former patent, No. 564,705, dated July 28, 1896. Each of these links *e'* has formed in its outer face and at its forward end upper and lower projecting lugs *e*⁵. Each of the links *e'* is provided in its outer face with tool-holding sockets into which are adapted to be inserted the shanks of outwardly-projecting cutting-tools *g*, these cutting-tools being arranged in pairs one above the other. As indicated in the drawings, the T-shaped recesses *e*⁴ on the inner sides of the links *e'* are designed to embrace the guide-bar *d*, the latter acting as a guide on which said links may slide when in motion.

h represents my improved holding-bar, which has its rear end portion secured, as indicated at *h'*, to the rear portion of the sliding frame, this connection of said bar and frame being made, as indicated, on the outer side of the cutting-chain and at a distance therefrom. As indicated in the drawings, this holding-bar *h* extends outward to a point *h*³, from which point said bar extends forwardly in a direction substantially parallel

with the direction of the length of the sliding frame and along the outer side of the lateral arm of the chain *e*. This forwardly-extending arm *h*⁴ of the bar *h* passes, as shown, between the pairs of projecting tools *g*, the outer face of said bar being substantially on a plane with the outer ends of said cutting-tools. In its forward portion the bar-arm *h*⁴ bears, as indicated, between the lugs *e*⁵ of the tool-holding links. This forward portion of the bar is formed, as shown more clearly in Fig. 2 of the drawings, with its outer corners beveled, thereby admitting of its passage between the pairs of inturned tools and conforming to the incline of the latter. As shown in Fig. 1, the bar-arm *h*⁴ extends to a point opposite the shaft *d*', at which point said bar-arm has detachably connected with its end a forwardly-projecting head *i*, the latter being provided with a beveled end, as shown.

From the construction herein shown and described it will be seen that the machine is provided on one side with a holding-bar, which, owing to the fact that it extends between the cutting-tools of the chain, comes into contact with the side wall of the coal and in the center of the kerf formed therein by said cutters. It will also be observed that this holding-bar is located on that side of the machine toward which the machine is naturally forced by the resistance which the coal offers to the cutters on the front arm of the chain and that said bar will thus receive this lateral thrust of the machine. While the holding-bar is not designed as a cutting-bar in the sense of producing a kerf in the coal wall, it is obvious that the forward beveled or sharpened head *i* may operate to cut away the comparatively slight coal ridge or projection which may be left between the pairs of cutting-tools *g*. It will thus be seen that my improved holding-bar offers substantially no resistance to the forward movement of the machine, as in cases where the holding-bar is forced or otherwise driven into the solid coal wall. Owing to the further fact that said bar is embraced by the pairs of cutting-tools, it is obvious that any tendency toward the bar working out of its proper position is entirely obviated, said tools forming guides or keepers for the bar.

As indicated in the drawings, the forward end portion of the holding-bar is practically in contact or engagement with the tool-holding links, said bar thus serving to form a substantially solid filling between the link-bodies

and the inner wall of the kerf, said filling thereby receiving the thrust of the machine toward the side on which it is employed and preventing any tendency of a lateral movement of the machine.

From the construction and operation described it will be seen that my improved holding-bar is of simple construction and arrangement and that the same may be produced and properly connected with the traveling frame of a mining-machine at a low expense.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a mining-machine, the combination with the sliding frame thereof, an endless chain mounted and traveling on said frame and cutting-tools projecting from a portion of the links of said chain, said cutting-tools being arranged in pairs, of a holding-bar supported from and extending on the outer side of said traveling frame, said holding-bar passing between the tools of said pairs and having its outer surface on substantially the same plane with the outer ends of said tools, substantially as and for the purpose specified.

2. In a mining-machine the combination with the sliding frame, a traveling endless chain mounted thereon and tools projecting from portions of said chain-links, said tools being arranged in pairs as described, of a holding-bar supported from said traveling frame and extending on the outer side of the latter and between the tools of said pairs and a detachable head at the forward end of said holding-bars, substantially as and for the purpose specified.

3. In a mining-machine the combination with the sliding frame, an endless cutting-chain mounted and running thereon, said chain consisting of jointedly-connected and alternately-arranged tool holding and connecting links, tools projecting from a portion of said links, said tools being arranged in pairs, and oppositely-located lugs *e*⁵ formed on the outer faces of said tool-holding links, of a holding-bar supported from said traveling frame and extending substantially in the direction of the length of the latter on one side thereof, said holding-bar passing between the tools of said bars and between the lugs *e*⁵ of the tool-holding links, substantially as and for the purpose specified.

FRANCIS M. LECHNER.

In presence of—

C. C. SHEPHERD,
E. W. BRINKER.