(No Model.)

F. N. SLADE.

MINING MACHINE.

No. 493,659. Patented Mar. 21, 1893.

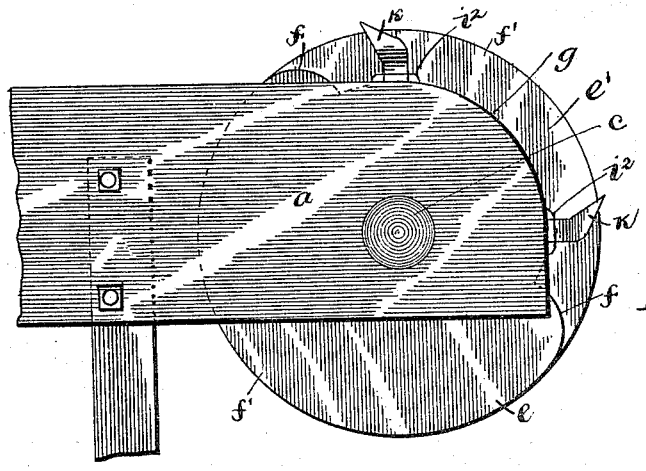

Fig. 1

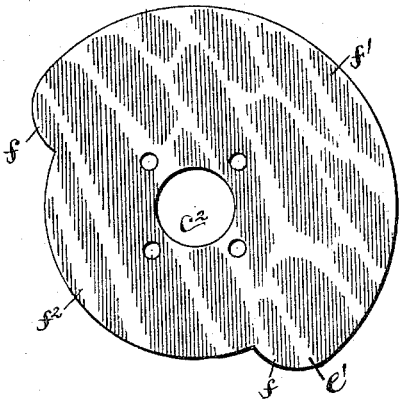

Fig. 2

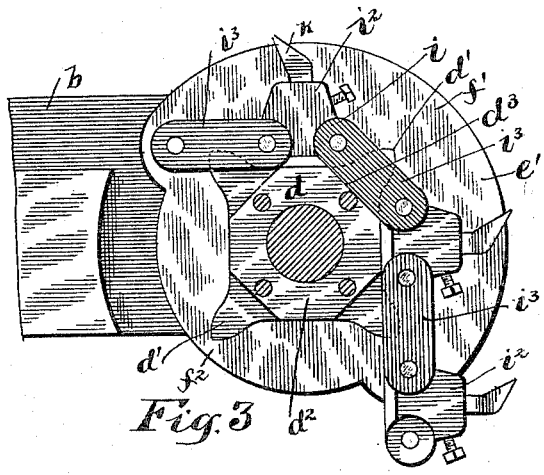

Fig. 3

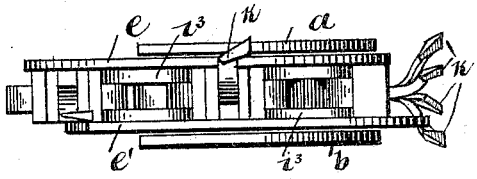

Fig. 4

WITNESSES:

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FRANK N. SLADE, OF COLUMBUS, OHIO.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,659, dated March 21, 1893.

Application filed April 11, 1892. Serial No. 428,710. (No model.)

To all whom it may concern:

Be it known that I, FRANK N. SLADE, 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 holding devices for mining machines and the objects of my invention are, to provide that class of mining machines wherein are employed chain cutters, with superior means for holding the framework of the machine against lateral movement or displacement during the cutting operation; to so construct and utilize said holding device as to obviate the necessity of forming a separate holding cut or kerf in the coal wall; to provide said holding device in a simple, effective and inexpensive manner and to produce other improvements which will be more specifically 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 showing a part of the forward end of the sliding frame and showing my improved holding device in connection therewith. Fig. 2 is a detail face view of one of the holding plates. Fig. 3 is a plan view showing the upper holding plate removed and Fig. 4 is a side elevation of the holding plates and cutting chain.

Similar letters refer to similar parts throughout the several views.

a represents the upper plate of the forward cross-piece of the sliding frame and *b* represents the lower plate thereof. The plates *a* and *b* are as is usual in this class of machines, connected near their ends by a vertical pin or shaft *c*, upon which is mounted between said plates, a sprocket-wheel *d*. As shown in the drawings, those portions of the upper and lower face of this sprocket-wheel which do not embrace the teeth *d'* thereof are as shown at d^2, thickened or elevated resulting in the formation of shoulders d^3 at the bases of said teeth. To these elevated portions d^2 of the sprocket wheel, are riveted or otherwise secured to the upper and lower holding plates *e*, *e'*. Each of these plates is in the form of a disk segment which occupies the greater portion of the area of a complete disk. That side of each of the plates *e*, *e'* which is cut away has its edge or periphery at opposite points beyond the center of the larger circle described, curved inward a short distance to form rounded shoulders *f*. The inner ends of these shoulders *f* are connected by the ends of a shorter arc of which the shaft opening c^2 is the center. The substantially cam-shaped body thus formed produces as shown, the rounded lobes *f'*, f^2. The arc of the circle described by each of the smaller lobes f^2 of the plates *e*, *e'* conforms as shown, to the curve of the outer corners *g* of the frame plates *a*, *b*, the curved edges of said plate corners, *g* and lobes f^2 being adapted to be brought into vertical alignment, as shown. In securing the plates *e e'* to the body of the sprocket wheel, said plates are so arranged that the smaller lobe of the plate *e'* is covered by the larger lobe of the upper plate *e*, said plates thus forming conjointly, when viewed in plan, a complete circle in the arc of the greater lobe *f'*.

i represents a cutting and driving chain which may be of any desired form of tool-carrying chain. Of this chain i^2 represents the tool-holding link and i^3 the connecting links between which the lugs or teeth of the sprocket-wheel engage.

k represents the cutting tools, the shanks of which are adjustably supported in the tool-holding links i^2 from which said cutting tools project. The outer and sharpened ends of these tools project as shown, slightly beyond the arc described by the larger plate lobe *f'*. As is usual in this class of cutting chains, the cutting tools travel in the following order, to-wit: An upwardly inclined intermediate tool, a long upwardly inclined tool, a short intermediate downwardly inclined tool and a long downwardly inclined tool.

Motion having been imparted to the chain in the usual or well-known manner and a forward feeding motion being imparted to the sliding frame of which the plates *a*, *b*, are a part, the operation of my holding device is as follows: For the sake of illustration, we will assume that the two cutting tools exposed in Fig. 1 of the drawings, are upwardly inclined tools and that the edge of the lobe *f'* of the lower hold-

ing plate e', is within that portion of the kerf of the coal wall previously cut by the downwardly inclined cutters. The parts being in these positions, it will readily be seen that that portion of the kerf produced by the upwardly inclined cutting tools shown in Fig. 1 of the drawings, will be entered by the larger lobe f' of the plate e and in this manner the larger lobes of the upper and lower plates e' and e will successively enter the kerf portions produced respectively by the downwardly and upwardly inclined cutting tools. From the construction and operation above described, it will readily be seen that the positions of the rotating plates e and e' within the kerf, are such as to bring said plates into contact with the coal at the end of the kerf and thus prevent any lateral movement of the machine which might otherwise be produced by the resistance of the coal to the engaging tools. It will be observed that this method of assuring the position of the machine is exceedingly simple, and that it affords at all times a lateral resistance in the direction opposite that in which the cutting tools are moving. It will also be observed that the construction herein described, obviates the necessity of forming a second or holding kerf in the coal wall and that the parts are arranged and formed in a durable and reliable manner.

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, a sprocket wheel journaled therein and a cutter chain running on said wheel, of a holding device projecting from the machine or a part thereof, and engaging with the kerf cut by said cutting chain, substantially as specified.

2. In a mining machine, the combination with the sliding frame, a sprocket wheel journaled therein, and a cutter chain traveling on said sprocket wheel, of holding plates secured to and projecting from the faces of said sprocket wheel, substantially as and for the purpose specified.

3. In a mining machine, the combination with the sliding frame, sprocket wheels journaled therein, and tool-holding chains carried on said sprockets, of the holding plates e, e' secured respectively to the upper and lower faces of said sprocket wheel, said plates being formed with large and small lobes as described, and adapted to enter the kerfs formed by the cutting tools of said chain, substantially as and for the purpose specified.

FRANK N. SLADE.

In presence of—
C. C. SHEPHERD,
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