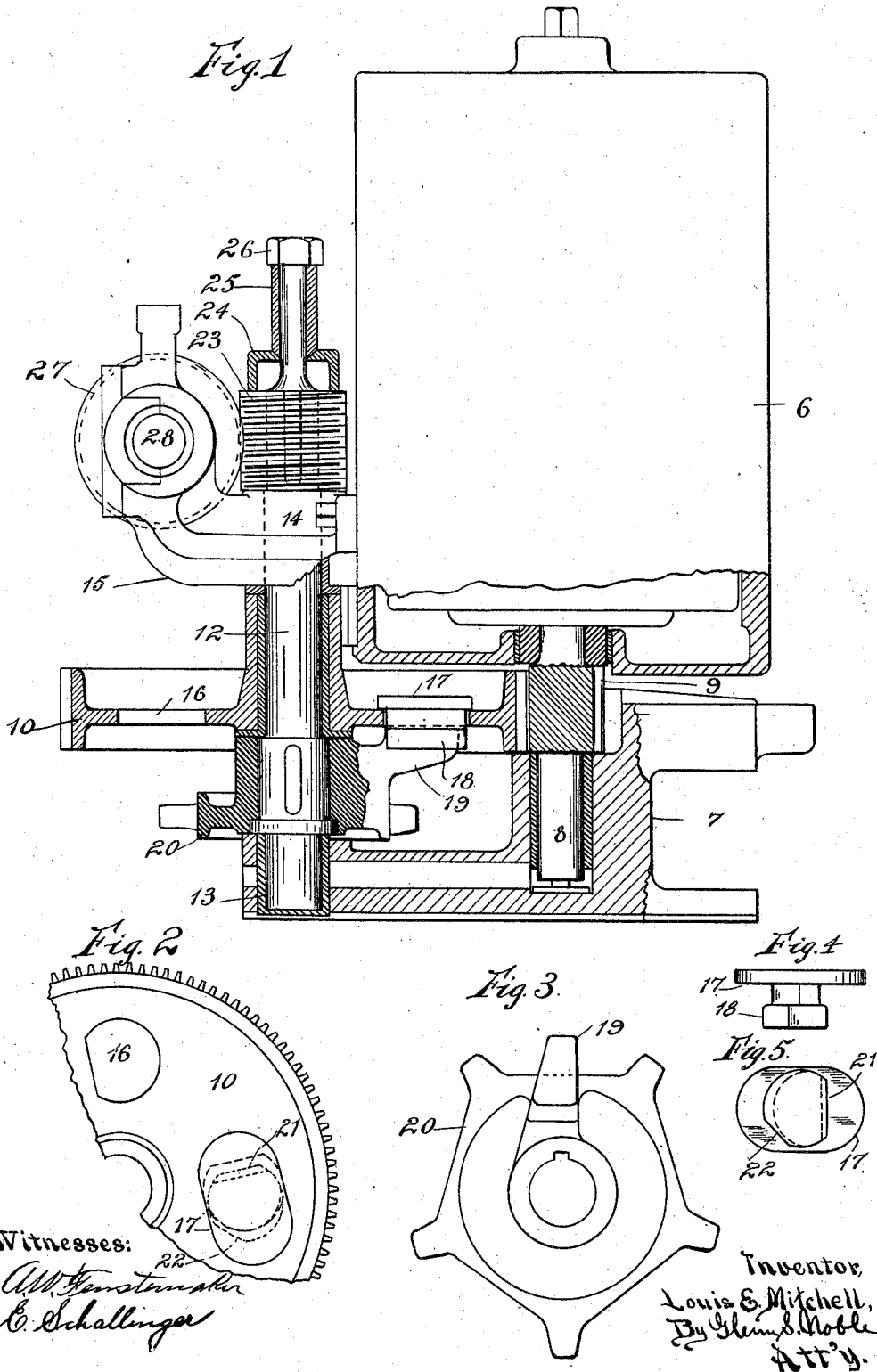


L. E. MITCHELL.
DRIVING APPARATUS.
APPLICATION FILED JUNE 28, 1909.

981,101.

Patented Jan. 10, 1911.



UNITED STATES PATENT OFFICE.

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DRIVING APPARATUS.

981,101.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS E. MITCHELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Driving Apparatus, of which the following is a specification.

This invention relates more particularly to apparatus used in connection with mining machines of the chain-cutting type, and its objects are to improve certain features thereof relating particularly to the arrangement for driving the cutting chain and feed-operating devices from the motor. In mining machines of this type, it frequently occurs that it is desirable to drive the motor of the machine without driving the cutting chain or the chain-feeding devices. This is particularly the case when the machine is used in connection with a self-propelling truck, such as is commonly used with such machines.

My invention relates, therefore, particularly to the driving connection between the motor and the sprocket for driving the cutter-chain and also to the connection with the feeding device used for feeding the chain into the coal or other material to be cut.

I have illustrated my invention in the accompanying drawings, in which—

Figure 1 is a view showing the motor of a mining machine, together with the connected parts particularly embraced in the present invention; Fig. 2 is a detail of one of the driving gears; Fig. 3 is a top plan view of the sprocket for driving the cutting chain; and Figs. 4 and 5 are details of the lock used for locking the driving gear with the driving sprocket.

As shown in these drawings, 6 represents a motor suitably mounted on a frame 7, or secured to other parts of a mining machine, and having the driving shaft 8 provided with a pinion 9 adjacent to the lower end thereof. The pinion 9 meshes with a gear 10 loosely mounted on a stub or counter-shaft 12 which has its lower end secured in a bearing 13 in the frame 7 and which also has a second bearing 14 in a bracket 15 adjacent to the top thereof. The web of the gear 10 is provided with a plurality of holes or openings 16 of the peculiar form indicated in Fig. 2, that is, a segment of a circle, with the straight side arranged about on a radius of the gear. A lock or driving

member 17 of the form particularly shown in Figs. 4 and 5 is adapted to be inserted, at times, in one of these openings 16 in order that its lower end 18 may engage with an upwardly extending projection or lug 19 on the sprocket 20 which drives the cutter-chain (not shown). This sprocket is keyed to the shaft 12 so that when the sprocket is turned, the shaft will be driven therewith.

The lock or driving member 17 consists of a top plate which is adapted to rest on the web of the gear 10, with a short neck which connects it with the slightly enlarged lower end 18. This lower end is flattened on one side as indicated at 21 to engage with one side or face of the lug 19, and is also flattened on the opposite side as indicated at 22 to engage with the opposite face or side of this lug. It will be noted that the lower end projects slightly in each direction, with respect to these driving faces, beyond the neck portion, this being for the particular purpose that when the lock has been inserted in the opening 16, the motor may be reversed to drive the sprocket in either direction, and when in driving position the lower portion of the lock will hook under the lower side of the web of the gear so that the lock will not be thrown out of position, as might otherwise occur. At the upper end of the shaft 12 is a worm 23 which is keyed or feathered to the shaft so that it will be driven therewith but may move longitudinally under excessive strain, this worm being held in position by a breakable washer 24 and collar or sleeve 25, the latter being secured by a nut 26 on the end of the shaft 12. This worm engages with a worm gear 27 mounted on an adjacent shaft 28, this shaft in turn driving the feeding devices which, however, form no part of the present invention and therefore are not shown.

In operation, it will be readily seen that when the lock 17 is removed from the gear 10, the motor may be driven and will only turn the gear, without turning the shaft 12 or the parts connected therewith. This might occur, for instance, when the motor is being used in connection with a self-driving truck for transporting the machine from one part of the mine to another. Then, when it is desired to operate the cutting chain and feeding device, the lock 17 will be inserted in one of the openings 16, and on account of the peculiar form of the opening and the

peculiar form of the lower portion 18 of the lock, this lock can only be inserted in one position, so that there will be no liability of the operator inserting it wrongly. When this lock has been inserted, the lower end thereof will engage with the upwardly extending projection or lug 19 and will drive the sprocket 20 which in turn will drive the shaft with the feeding worm at the upper end thereof. It will be noted that this arrangement whereby the shaft is turned gives a long substantial bearing on the shaft for the gear 10 and also permits substantial and rigid bearings for the shaft itself in the main frame portions of the machine. Furthermore, by means of this particular driving arrangement, the gears for driving the feeding device will never be operated unless the chain-driving sprocket is also operated, so that a careless operator cannot leave the feeding mechanism in operation unless the chain is being driven, in which case the machine should be in position for operation.

Having thus described my invention, which I do not wish to limit to the exact arrangement or details of construction herein shown and described, what I claim and desire to secure by Letters Patent is:

1. In a driving apparatus for mining machines, the combination of a gear adapted to be driven from the motor of the machine, a shaft on which said gear is loosely mounted, a sprocket secured to said shaft and adapted to drive the same, and means whereby said sprocket may be driven by said gear or may be freed therefrom.

2. In a driving apparatus for mining machines, the combination of a counter-shaft, a gear loosely mounted on said counter-shaft, said gear being driven from the motor of the machine and having holes in the web

thereof, a sprocket having a lug, secured to said counter-shaft, and a lock adapted to be inserted in one of the openings in the web of said gear for engagement with said lug to drive the sprocket.

3. In a mining machine, the combination of a motor, a pinion driven by said motor, a gear engaging with said pinion, said gear having a segmental opening in the web thereof, a lock having its lower end corresponding with the opening through said web so that it can only be inserted through said opening when in one position, said lower end being provided with driving faces, a shaft on which said gear is mounted, a sprocket wheel secured to said shaft adjacent to said gear, and having a lug or projection thereon with faces adapted to engage with the faces on the lower end of said lock, and power transmitting mechanism driven by said shaft.

4. A lock for driving a sprocket from a gear, comprising an upper supporting portion adapted to rest on the web of the gear and having a short neck corresponding in shape to the opening in said web through which it is to be inserted and having a lower driving end also corresponding in shape with said opening but projecting laterally beyond the sides of said neck, the form being such that when the lock is shifted in either direction on the web after the lower end has been inserted through said opening, the projection on one side of said driving end will come under the adjacent edge of the web of the driving gear.

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Witnesses:

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