

No. 646,975.

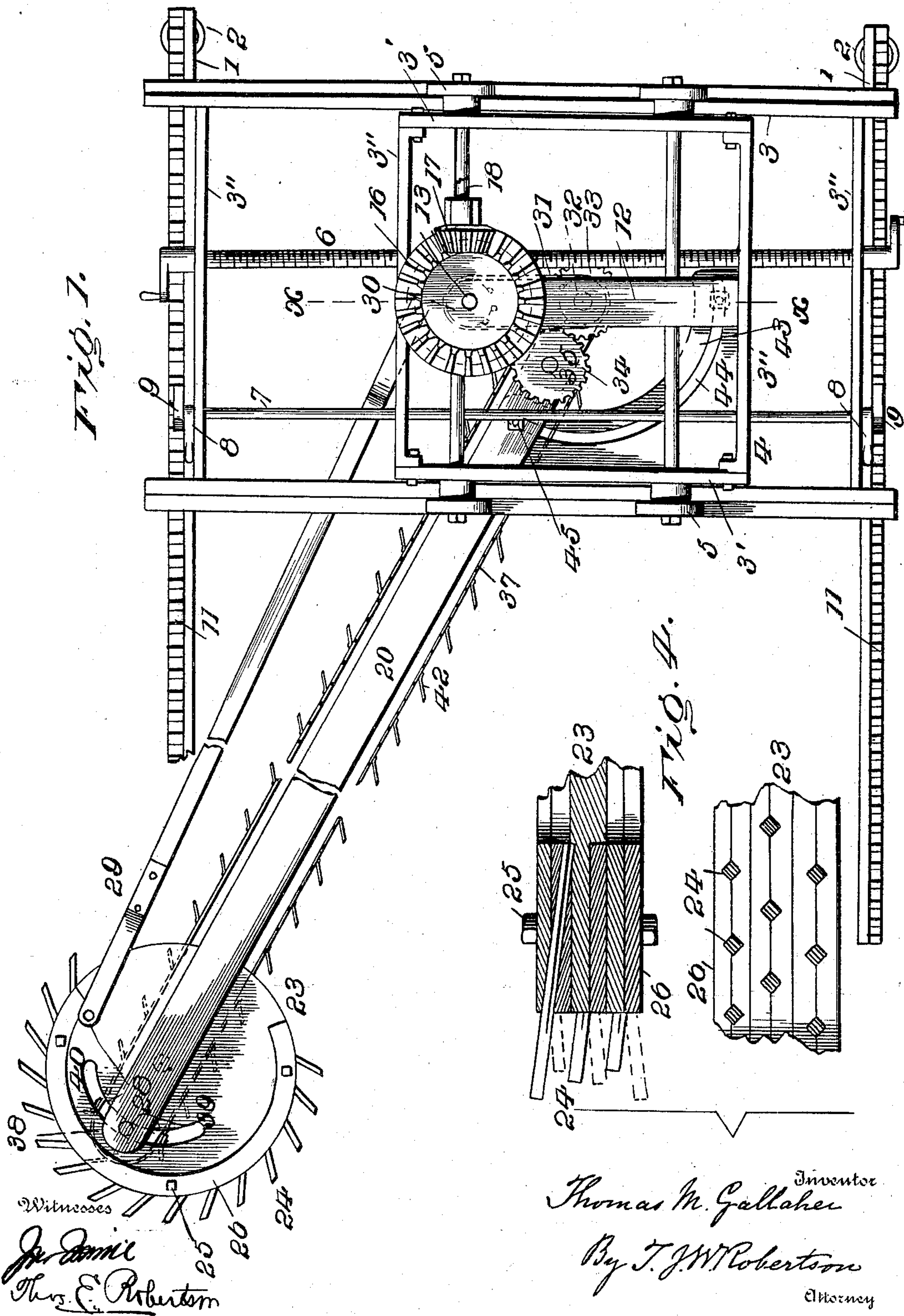
Patented Apr. 10, 1900.

T. M. GALLAHER.
COAL MINING MACHINE.

(No Model.)

(Application filed May 1, 1899.)

2 Sheets—Sheet 1.



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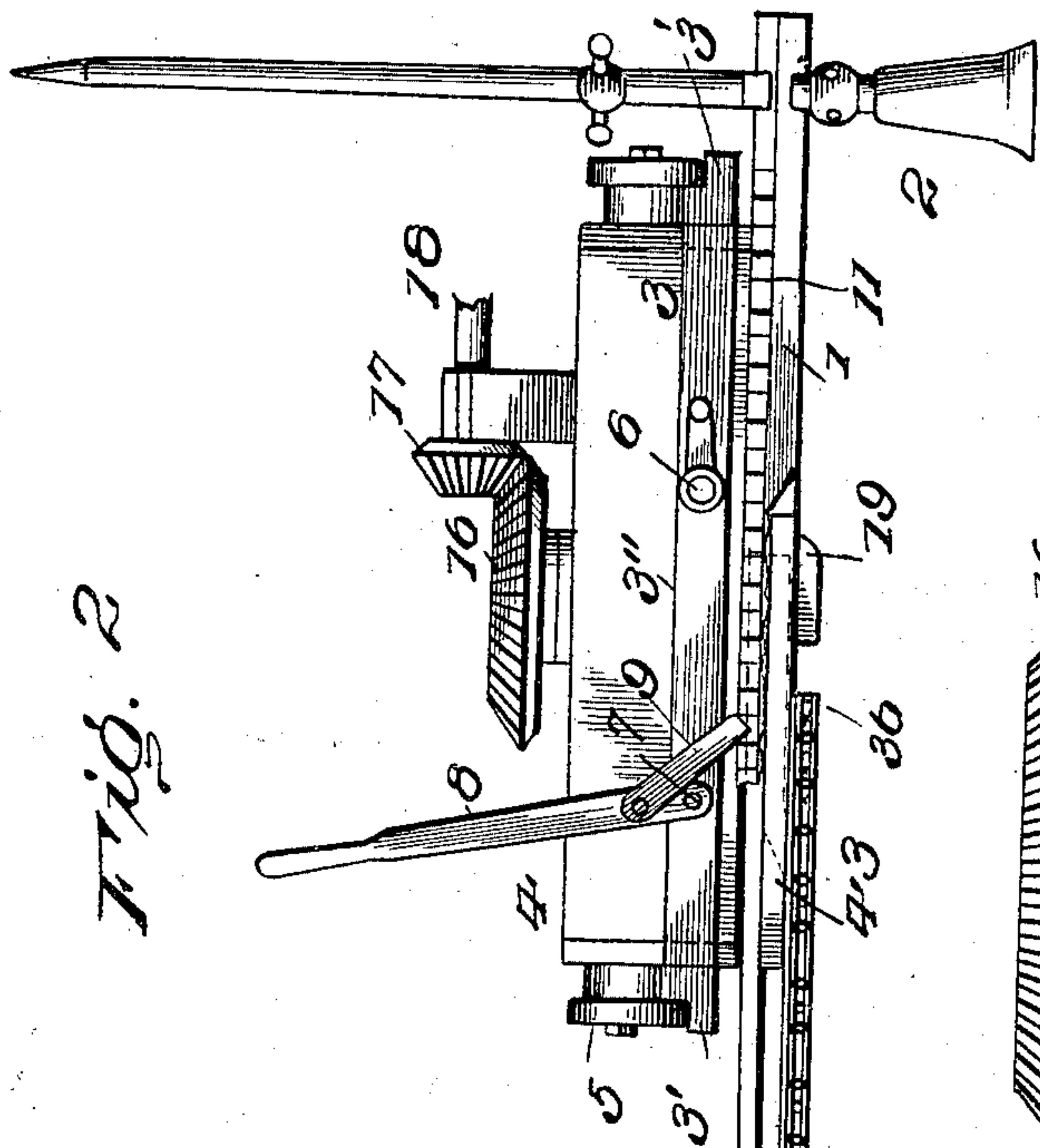


Fig. 2

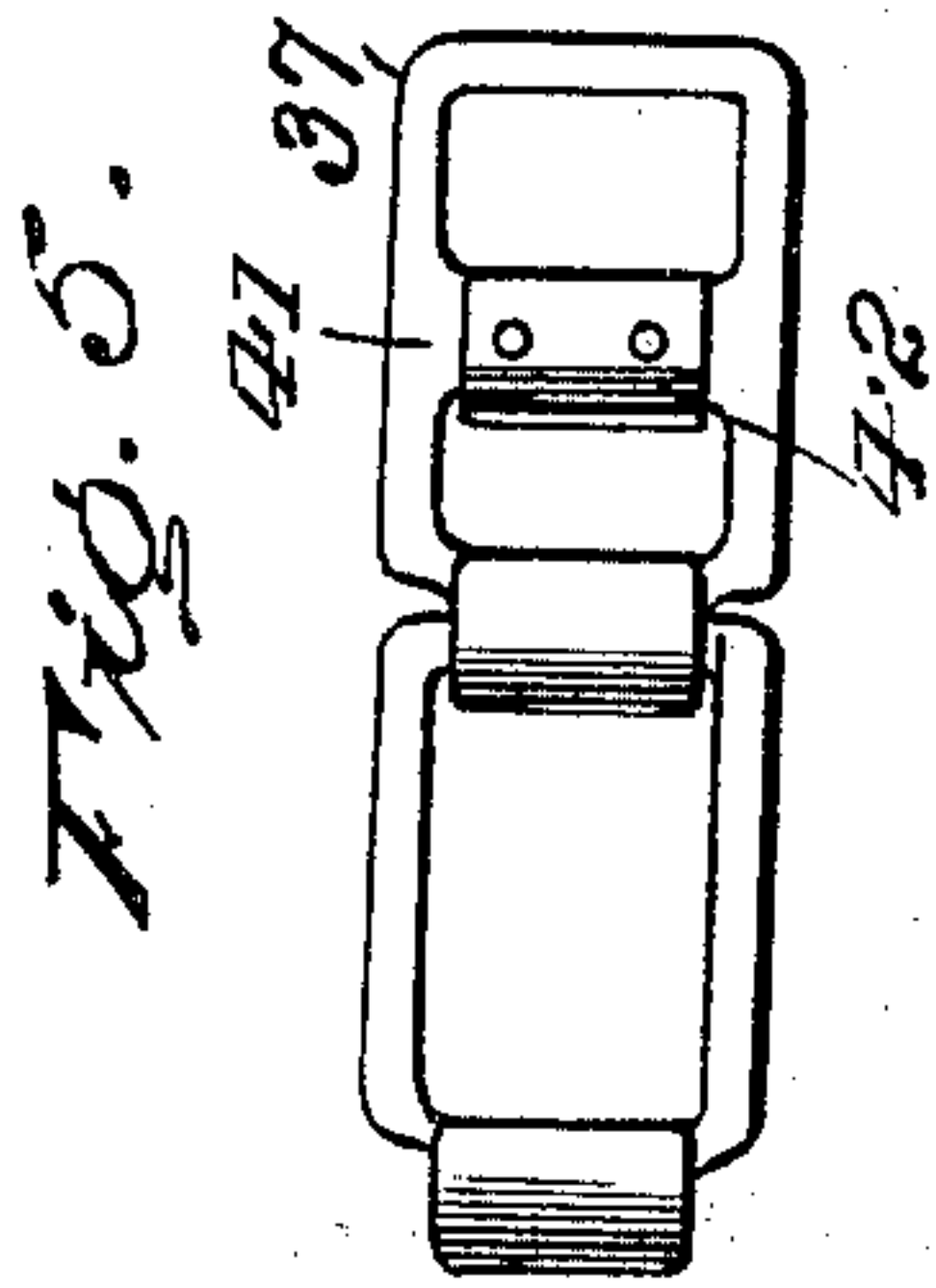


Fig. 5

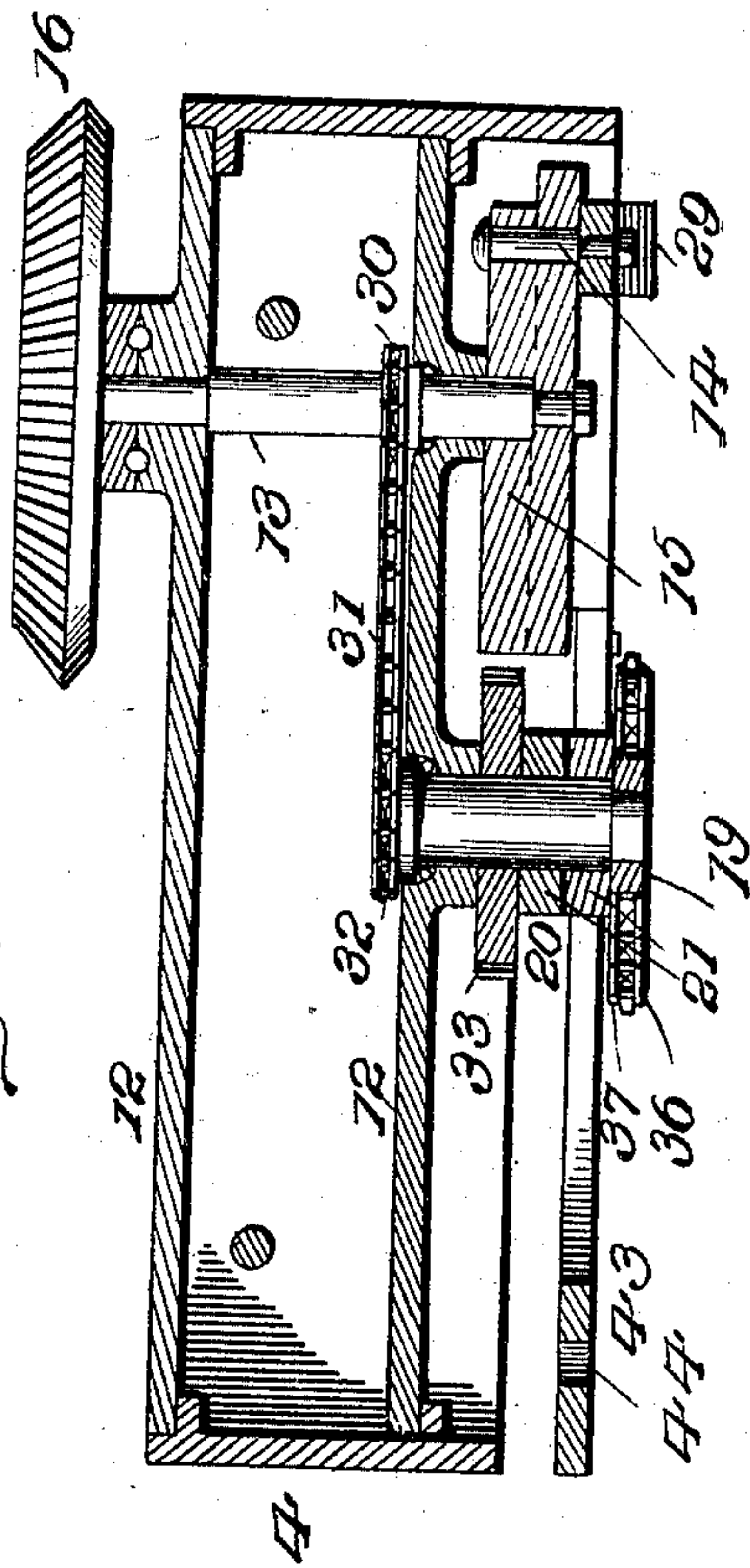
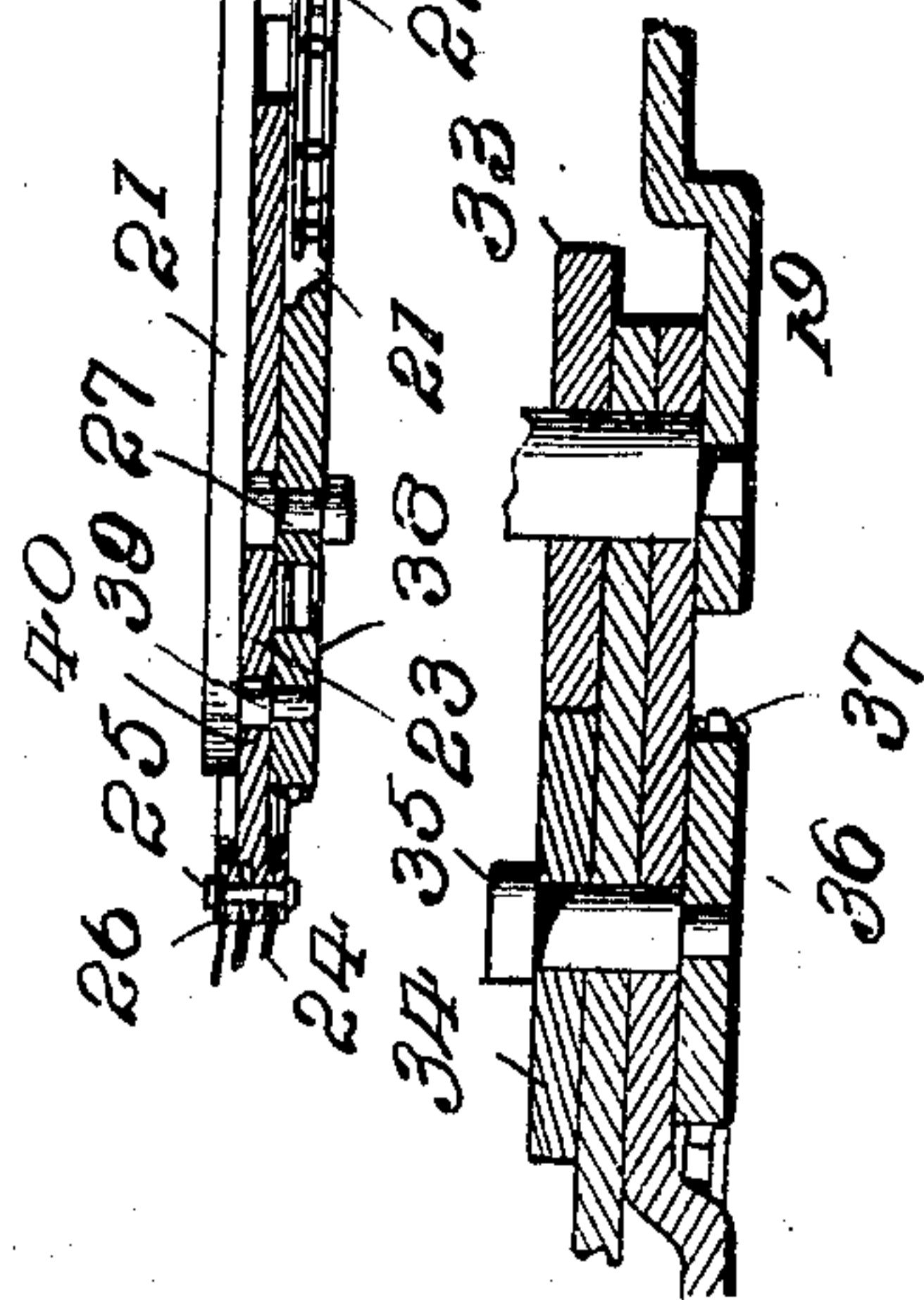


Fig. 3



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS M. GALLAHER, OF BELLAIRE, OHIO.

COAL-MINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 646,975, dated April 10, 1900.

Application filed May 1, 1899. Serial No. 715,207. (No model.)

To all whom it may concern:

Be it known that I, THOMAS M. GALLAHER, a citizen of the United States, residing at Bellaire, in the county of Belmont and State of Ohio, have invented a certain new and useful Improvement in Coal-Mining Machines, of which the following is a specification, reference being had to the accompanying drawings.

This improvement relates to that class of mining-machines in which the cutters have an oscillating or semirotary motion and is designed to produce a machine of this class which will be easy to operate, convenient in use, rapid in operation, and not likely to get out of order.

To these ends the invention consists in the peculiar construction hereinafter more particularly described and then definitely claimed at the end hereof.

In the accompanying drawings, Figure 1 is a plan of a machine constructed according to my improvement. Fig. 2 is an elevation of the same. Fig. 3 is a vertical section on the line *xx* on Fig. 1. Figs. 4 and 5 are details which will be more fully described hereinafter.

Referring now to the details of the drawings by numerals, 1 1 indicate two rails firmly secured on the floor of the mine by jacks 2. On these rails is set a carriage 3, comprising two rails 3' and end pieces 3'', on which rails runs the frame 4, having flanged wheels 5, and which may be moved from end to end of the carriage 3 by a screw 6, mounted in the end pieces 3''. To move this carriage up toward the face of the coal, I provide a shaft 7, running in the end pieces 3'', which carries at each end a lever 8, by which the shaft 7 may be rocked. To these levers are pivoted ratchets 9, which operate on racks 11, extending alongside of the rails 1 1, so that by operating either of the levers the carriage may be moved forward on the said rails toward the face of the coal. By reversing the ratchets the carriage may be run backward.

Running crosswise of the frame 4 are two bars 12, which form bearings for a vertical shaft 13, having at its lower end a crank 14 and counterbalance 15 and on its upper end a bevel-gear 16, which meshes with a bevel-pinion 17 on a shaft 18, which may be operated by any suitable or convenient power;

but I prefer an electric motor (not shown) which may be connected directly on said shaft 18.

Pivoted to an extension 19 of the side of the frame 4 is a swinging lever or carrier 20, formed of two bars 21, connected by blocks 22, the bars and blocks being all rigidly secured together. In the outer end of this carrier is mounted the cutting device, formed of a cutter-head 23, in which are set the cutters 24, secured by bolts 25, which clamp the plates 26 at the edge of the cutter-head firmly upon the cutters. The cutter-head oscillates on the bolt 27, which, it will be seen, is set eccentrically in the cutter-head for a purpose hereinafter mentioned. At 28 is shown a bolt which forms a pivot for the pitman 29, whose other end is connected to the crank 14, so that as the crank revolves the cutter-head is given an oscillating motion.

The shaft 13, in addition to the bevel-wheel 16, carries a sprocket-wheel 30, which gives motion, by means of a chain 31, to another sprocket-wheel 32, on the shaft of which is a spur-gear 33, meshing with another gear 34 on a shaft 35, mounted in the carrier 20, and on whose lower end is a sprocket-wheel 36, around which is a chain 37, that runs around another sprocket-wheel 38, working on a pin 39, set in the bar 21, which pin passes through a curved slot 40, formed in the cutter-head 23.

The links of the chain 37 have at certain intervals cross-bars 41, on which is riveted sheet-metal clearers or scrapers 42 for keeping the channel clear of the cut coal.

In the corner of the frame 4 is set a plate or casting 43, having a curved slot 44, through which and the carrier 20 passes a bolt 45, so that the carrier may be adjusted in any desired position within the range of the slot, which is made of a considerable length, so that the carrier may be turned around to set parallel with the carriage, which will be found convenient in moving it through the passages of the mines. It will also be found very useful in starting the work and in operating in narrow passages and corners, where the machine could not be used if the carrier was not adjustable.

Although I show a screw for moving the frame on the carriage, I do not limit myself to this, as any other suitable mode of moving the frame may be adopted—such, for in-

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stance, as the device used for moving the carriage on the rails.

The operation is as follows: Motion being given to the shaft 18 in any convenient manner, the bevel-pinion 17 and the gear 16 operate the crank 14, which gives an oscillating or partial rotary motion to the cutter-head 23, causing the cutters to act on the coal, and as the frame 4 is moved along by the screw or ratchet, as the case may be, a channel is cut in the face thereof, the material falling down in the channel being rapidly removed by the scrapers 42, which will prevent any jamming of the cutters in the channel. When a cut has been made along the face of the coal, the frame 4 is moved backward by reversing the screw or ratchet and one of the levers 8 operated, which will cause the ratchets 10 to engage with the racks 11, and thus move the carriage 3 and cutters forward toward the face of the coal when the above operation is repeated.

The cutters 24 are set in the manner shown in Fig. 4, so as to cut a comparatively-wide channel.

By setting the cutter-head eccentrically each cutter acts on the coal, cutting its own way in the channel. The same effect would be produced, however, by projecting each cutter a little farther out than the preceding one; but I prefer to set the cutter-head eccentrically, as each cutter thus receives equal support.

I do not limit myself to the exact details of construction, as they may be varied in many ways without departing from the spirit of my invention.

What I claim as new is—

1. In a mining-machine, the combination of a frame, a carrier having one end pivoted on

said frame, a cutter-head mounted on a shaft near the extremity of the other end of the carrier, a sprocket-wheel mounted on a shaft on the outer end of said carrier beyond the shaft of the cutter-head, a second sprocket-wheel mounted on the inner end of the carrier, a clearing-chain working independently of the cutter-head and means for giving motion to the second sprocket-wheel, substantially as described.

2. In a mining-machine, the combination of a carrier, a slotted cutter-head mounted thereon, a sprocket-wheel below the cutter-head, a support therefor passing through the slot in the cutter-head and secured in the carrier, and a clearing-chain passing around said sprocket-wheel, substantially as described.

3. In a mining-machine, the combination of a suitable frame, a carrier 20 pivoted thereon, and a shaft 13 running in said frame, a sprocket-wheel 30 on said shaft, a second sprocket-wheel 32 mounted on a shaft forming a pivot for the carrier 20, a sprocket-chain 31 connecting said sprocket-wheels, a spur-wheel 33 on said last-mentioned shaft, another spur-wheel 34, a shaft 35 carrying said spur-wheel 34 and a sprocket-wheel 36 and mounted on the inner end of the carrier, a sprocket-wheel 38 on the outer end of the carrier, and a clearing-chain 37 carried by said sprocket-wheels 36 and 38, substantially as described.

In testimony whereof I affix my signature, in the presence of two witnesses, this 28th day of April, 1899.

THOMAS M. GALLAHER.

Witnesses:

A. M. F. BOYD,
J. Q. ADDISON.