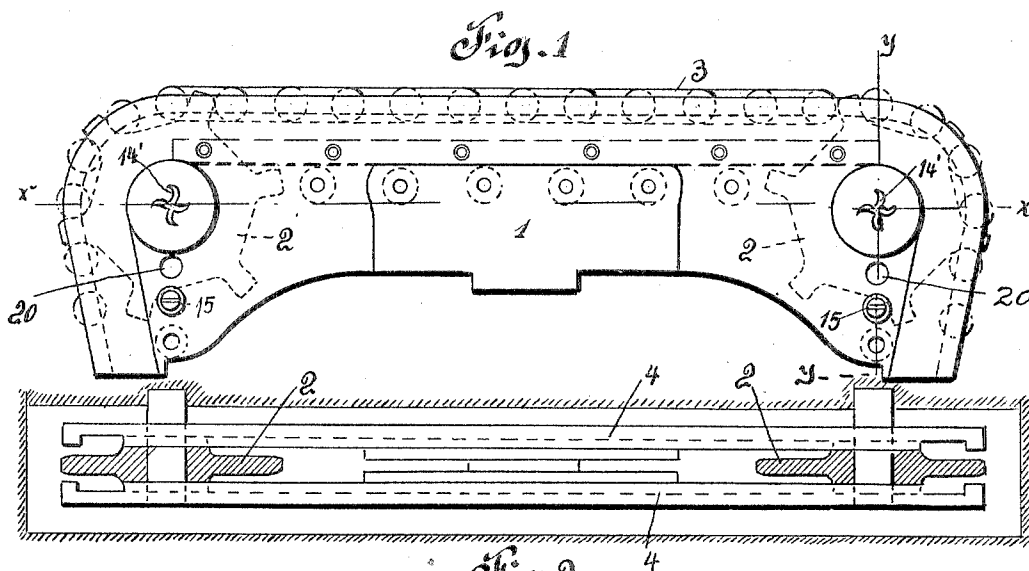
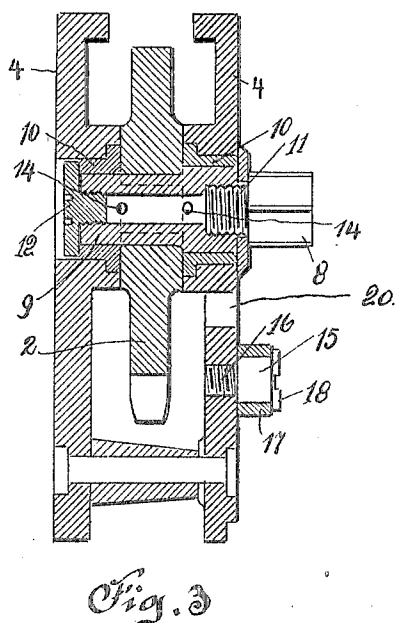
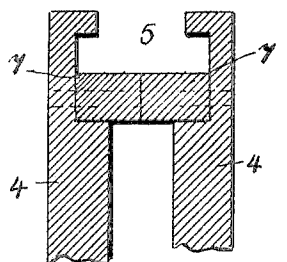
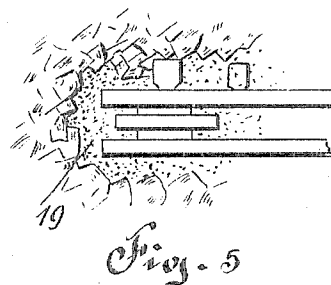


J. STEIN.
MINING MACHINE.
APPLICATION FILED JULY 21, 1905.



Witnesses:

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UNITED STATES PATENT OFFICE.

JACOB STEIN, OF MENDELSSOHN, PENNSYLVANIA, ASSIGNOR OF ONE-FOURTH TO MORRIS HAAS, THIRTY-FIVE ONE-HUNDREDTHS TO FRANKLIN A. BAXENDELL, AND FIVE ONE-HUNDREDTHS TO LUTHER K. YODER, OF PITTSBURG, PENNSYLVANIA.

MINING-MACHINE.

No. 804,562.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed July 21, 1905. Serial No. 270,709.

To all whom it may concern:

Be it known that I, JACOB STEIN, a citizen of the United States of America, residing at Mendelssohn, in the county of Allegheny and State of Pennsylvania, 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 certain new and useful improvements in mining-machines; and the invention has for its object the provision of novel means for preventing a lateral movement of the conveyer or forward end of a machine when in operation.

Another object of this invention is to provide novel means for cutting a longitudinally-disposed groove or kerf in the material being mined, this groove or kerf facilitating the work of removing the material, at the same time preventing the forward end of the machine from swaying during its cutting operation.

Briefly described, the invention is particularly adapted for that type of mining-machine wherein a conveyer or forwardly-extending portion is used to guide a chain carrying numerous bits. In conjunction with this chain and the wheels over which it travels I employ rotary bits which are mounted directly above the wheels over which the chain travels and are rotated by said wheels. These bits are adapted to cut a groove or kerf in the material being mined, and in conjunction with said rotary bits I employ vertically-disposed guide-arms, which are adapted to follow and travel in the groove or kerf cut by the rotary bit and prevent the conveyer or forward portion of the machine from swaying.

The above construction employed is extremely simple, strong and durable, comparatively inexpensive to manufacture, and highly efficient in operation.

Reference will now be had to the drawings accompanying this application, wherein I have illustrated the preferred manner of constructing and arranging my improved mechanism, and throughout the several views of the drawings like numerals of reference designate corresponding parts.

Figure 1 is a plan view of the forward end of a mining-machine. Fig. 2 is a cross-sectional view on the line *xx* of Fig. 1, illustrating the forward end of the machine in the position it assumes when in operation. Fig. 3 is a sectional view taken on the line *yy* of Fig. 1. Fig. 4 is a sectional view of a portion of the conveyer, illustrating a chain-bearing. Fig. 5 is an elevation of the forward portion of the machine as it appears when in operation.

In the accompanying drawings the reference-numeral 1 designates the forward end of a conventional form of mining-machine, which is generally known as the "conveyer" end of the machine. In this end of the machine are journaled sprocket-wheels 2 2, over which an endless chain 3 passes, adapted to carry a plurality of cutting-bits (not shown) for cutting and mining material, such as coal. The forward end of the mining-machine or conveyer consists of two frames 4 4, which are suitably spaced apart to accommodate the sprocket-wheels 2 2. The outer edges of the frames 4 4 are provided with a guideway 5, in which the chain is adapted to travel. This guideway is formed by bars 7 7, which serve to space the frames 4 4 apart, and over these bars the chain passes when in operation.

The parts above described are of an ordinary form, and it is not deemed necessary to further enter into the detail construction and arrangement of these parts. My invention resides in providing each of the sprocket-wheels 2 with a rotary bit 8. The sprocket-wheel 2 is mounted upon a hollow spindle 9, journaled in two bushings 10 10, which are mounted in the frames 4 4. In the uppermost end of the hollow spindle 9 I secure the screw-threaded shank 11 of the rotary bit 8, while in the lower end of the hollow spindle I secure a detachable plug 12. This spindle is adapted to be filled with waste and a suitable lubricant, and in order that the lubricant may reach the bearing parts of the sprocket-wheels 2 2 I provide the hollow spindle 9 with ports 14 14, which permits of the lubricant passing between the bearing-surfaces of the sprocket-wheel 2 and the bushings 10 10.

In the accompanying drawings I have illustrated the rotary bit as having four blades or wings 14'; but it is obvious that bits may be used with more or less blades, as desired. In

longitudinal alinement with the rotary bits 8 I provide the uppermost frame 4 with posts 15, the screw-threaded shanks 16 of which are secured in the frame 4. Upon each post I
 5 loosely mount the roller or sleeve 17, which is retained upon the post 15 by the head 18 of the post 15.

In operation as the conveyer end of the mining-machine is forced ahead to cut the
 10 coal or material being mined the rotary bits 8 will cut a groove or kerf in the top wall of the compartment 19 of the mine in which the machine is operating, and as this compartment is formed and the grooves or kerfs cut in the
 15 ceiling of the compartment the posts 15, carrying the rollers or sleeves 17, will follow in the path of the rotary bits 8 and prevent the conveyer or forward end of the mining-machine from swaying or swinging to either side
 20 during its operation, this often being occasioned by the rapidity at which the bits engage the material being mined and by the direction in which they are traveling. As the rotary bits 8 cut a groove or kerf in the top
 25 wall of compartment 19 the material resulting from this operation is disposed of by my providing a hole 20 in the top frame 4 to the rear of bits 8 and in direct alinement with and in front of post 15, allowing this material to
 30 work through hole 20 and passing off over sprockets 2 2. This provides a clear groove or kerf, through which post 15 passes.

It will be observed that besides providing the rotary bits I have devised novel means
 35 for lubricating the sprocket-wheels which operate the bits; but in some instances where it is not desired to use the lubricating construction which I have employed the sprocket-wheel spindle of the ordinary type of machine
 40 and those in present use can be simply provided with the screw-threaded orifice in which the rotary bits can be mounted.

It is thought from the foregoing that the construction, operation, and advantages of
 45 the herein-described mining-machine will be

apparent without further description, and various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages
 50 thereof.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with the frame of a mining-machine having sprocket-wheels journaled therein, a chain traveling over said
 55 sprocket-wheels, of vertically-disposed bits having threaded shanks screwing into the spindles of said sprocket-wheels and adapted to rotate in unison with said wheels, posts
 60 carried by the forward end of said frame adjacent to said bits, rollers journaled upon said posts, substantially as described.

2. In a mining-machine, the combination with a frame, of hollow spindles journaled in
 65 the forward end of the frame, said spindles being internally screw-threaded at each end, sprockets mounted on said spindles, a cutter-chain traveling over said sprockets, said spindles being formed with ports leading from the
 70 central bore thereof to the periphery of the spindle, lugs screwing into the lower ends of said spindles and rotary bits having screw-threaded shanks, said shanks screwing into the upper ends of said spindles.

3. The combination with the frame of a mining-machine, of vertically-disposed rotary bits
 75 carried by said machine, and actuated by the traveling chain of said machine, rollers carried by said machine adjacent to said bits, the top
 80 of said machine having openings formed therein between said rollers and said bits, substantially as described.

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

JACOB STEIN.

Witnesses:

CHAS. STEIN,
 FRANK A. BAXENDELL.