(No Model.) 2 Sheets—Sheet 1.

J. P. PAYNTER.

MINING DRILL AND CHANNEL CUTTER.

No. 395,716. Patented Jan. 8, 1889.

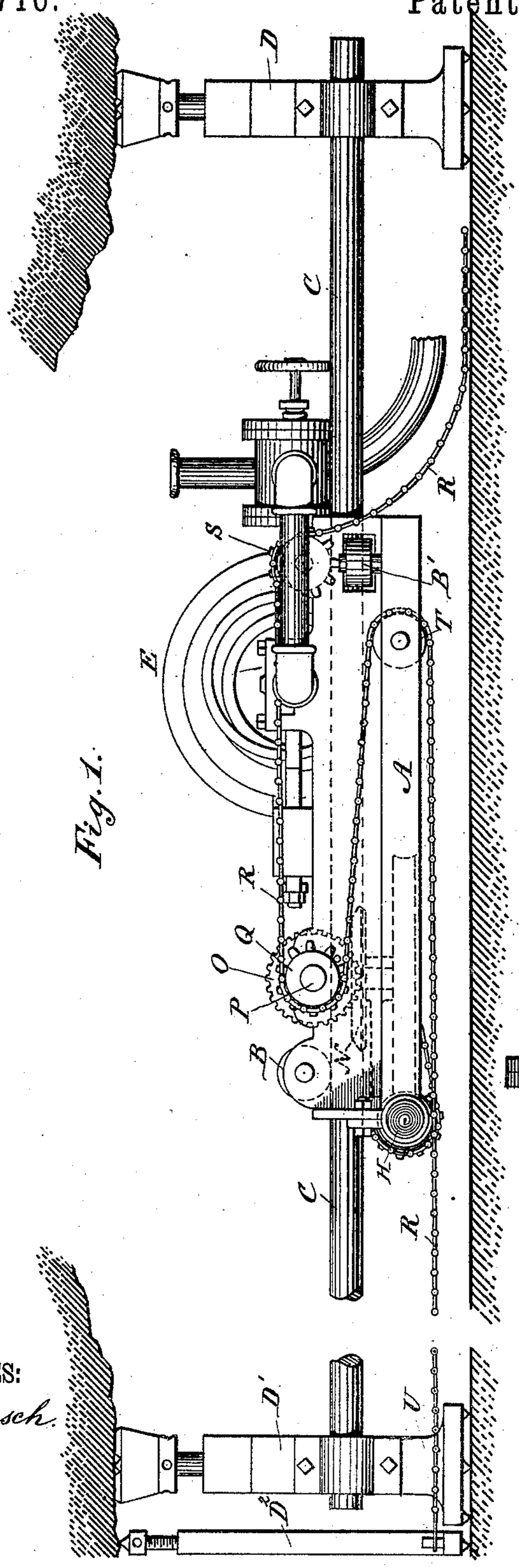

Fig. 1.

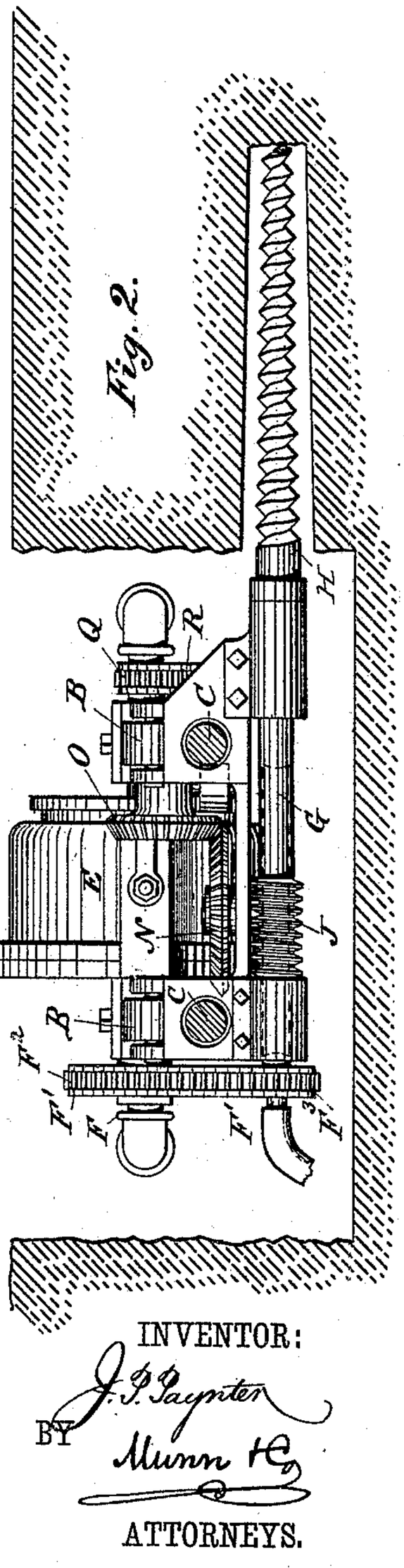

Fig. 2.

WITNESSES:

D. C. Reusch.

C. Sedgwick

INVENTOR:

J. P. Paynter

BY Munn & Co

ATTORNEYS.

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Fig. 3.

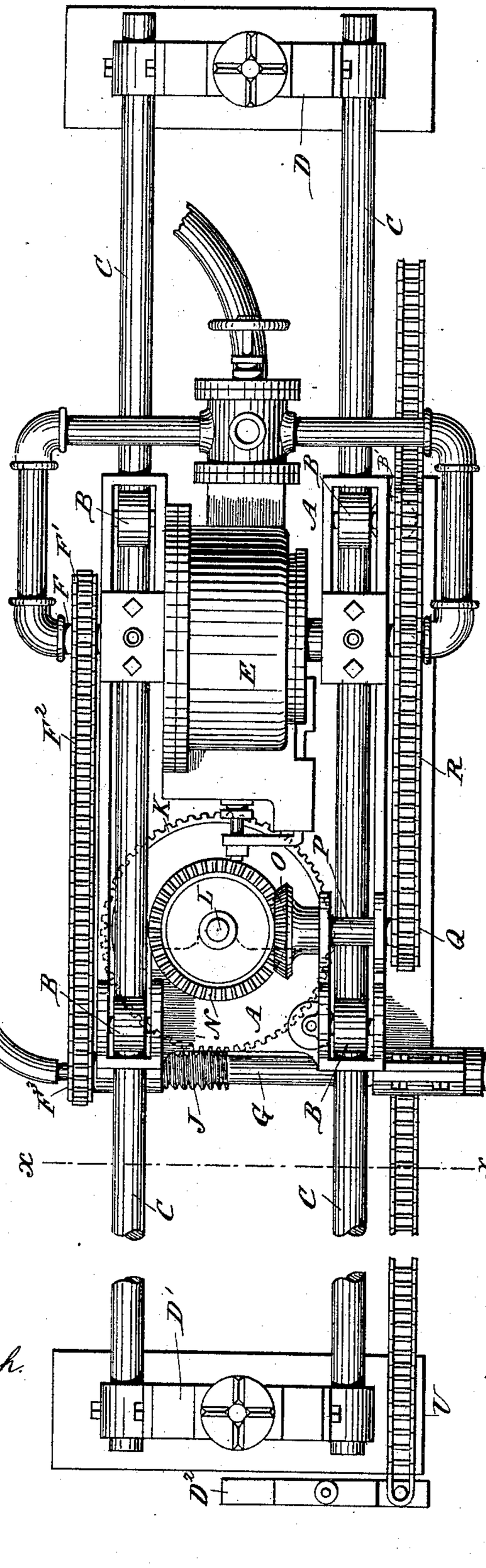


Fig. 4.

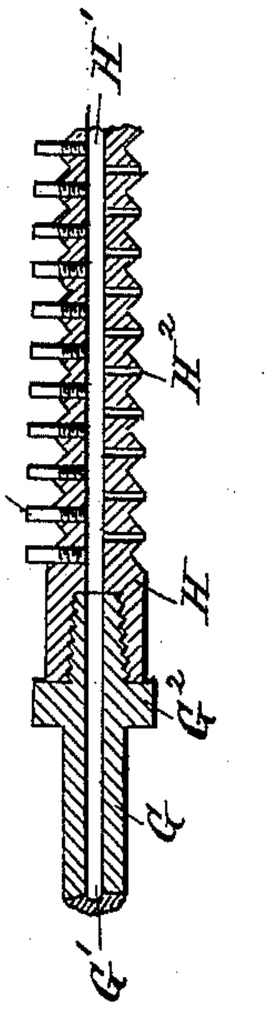
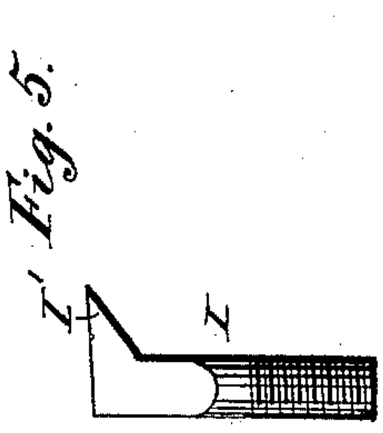


Fig. 5.



WITNESSES:
D. C. Reusch.
C. Sedgwick

INVENTOR:
J. P. Paynter
BY Munn & Co
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN PHILLIP PAYNTER, OF POMONA, KANSAS.

MINING-DRILL AND CHANNEL-CUTTER.

SPECIFICATION forming part of Letters Patent No. 395,716, dated January 8, 1889.

Application filed January 25, 1888. Serial No. 261,823. (No model.)

To all whom it may concern:

Be it known that I, JOHN PHILLIP PAYNTER, of Pomona, in the county of Franklin and State of Kansas, have invented a new and Improved Mining-Drill and Channel-Cutter, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved drill especially adapted in mining coal for undercutting the coal in small seams, so as to relieve the miner from the hardest and most difficult work, at the same time cheapening the cost of mining.

The invention consists in certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a sectional end elevation on the line $x\,x$ of Fig. 3. Fig. 3 is a plan view of the improvement. Fig. 4 is an enlarged sectional end elevation of the drilling-tool, and Fig. 5 is a side elevation of one of the cutters of the drilling-tool.

On a suitably-constructed frame, A, are mounted to rotate the pulleys B, traveling on longitudinal bars or pipes C, passing through the said main frame A and being supported at their outer ends in bearings fastened on jack-screws D and D′, of any approved construction and adapted to be set up in a mining-shaft.

On the main frame A is mounted the steam-engine E, of any approved construction and provided with a main driving-shaft, F, carrying a sprocket-wheel, F′, over which passes the endless sprocket-chain F^2, also passing over a sprocket-wheel, F^3, secured to one end of the shaft G, mounted to rotate in suitable bearings on the front end of the main frame A. On the opposite end of the shaft G screws the drilling-tool H, made in the shape of a conical screw and provided with one or more rows of cutters, I, screwing into the thread of the said screw, as shown in Fig. 4. Each cutter I is provided on its upper end with a point, I′, which cuts into the coal when the said screw is rotated.

The drilling-tool H is provided with a central aperture, H′, from which aperture smaller branch apertures, H^2, are formed, which pass through the body of the screw and serve to pass air through the drilling-tool H. The central aperture, H′, connects with a similar aperture, G′, in the shaft G, and the outer end of said shaft is connected by suitable hose with means for supplying air.

The inner end of the drilling-tool H abuts against the shoulder G^2, formed on the shaft G, so as to prevent said drilling-tool from screwing too hard on the said shaft G. On the latter is formed a worm, J, which meshes into a worm-wheel, K, secured on the vertical shaft L, mounted to rotate in suitable bearings on the main frame A, and on the said shaft L is secured a bevel gear-wheel, N, which meshes into a pinion, O, secured on the horizontal shaft P, mounted to rotate in suitable bearings on the main frame A, and carrying a sprocket-wheel, Q, over which passes the sprocket-chain R, also passing over a sprocket-wheel, S, mounted to rotate on the frame A, and then one end of the chain passes down to the ground, as shown in Figs. 1 and 3. The sprocket-chain R, after passing over the sprocket-wheel Q, passes over a sprocket wheel or pulley, T, mounted to rotate on one side of the main frame A, and then said chain passes forward and is secured by its outer end to a jack-screw, D^2, of any approved construction and set up in the mining-shaft.

A sidewise motion of the frame A on the longitudinal rod C is prevented by a friction-pulley, B′, mounted on a vertical shaft held to rotate on the main frame A, as shown in Figs. 1 and 3.

The operation is as follows: The machine is specially adapted for undercutting small seams of coal. In order to do this, the jack-screws D and D′ are set up in a mine-shaft into which the seam opens, and the said jack-screws support the rods or bars C, on which is held to travel the main frame A, as above described. The main frame A, with the drilling-tool H, is moved forward on the said rods C, and at the same time the drilling-tool H is rotated, so that the cutters I′ cut into the seam of coal, and the screw-threads on the said drilling-tool move the cuttings outward into the mining-shaft. Thus it will be seen

that the drilling-tool H cuts a narrow opening or slot in the seam or underneath the coal, so that the miner can easily wedge down the coal above. In the beginning the main frame A is near the rear jack-screw, D, and one end of the sprocket-chain R is secured to the jack-screw D^2, set up a suitable distance in advance of the machine. When steam is admitted to the engine E, its main shaft F is rotated, so as to impart by means of the sprocket-wheels F′ and F^3 and the sprocket-chain F^2 a rotary motion to the shaft G, whereby the drilling-tool H is rotated, and the cutters I cut with their points I′ into the seam of coal. At the same time the rotation of the shaft G imparts a rotary motion by means of its worm J, meshing into the worm-wheel K, to the shaft L, and the latter imparts its rotary motion, by means of the bevel gear-wheels N and O, to the shaft P, so that the sprocket-wheel Q is rotated, whereby the main frame A is pulled forward on the rod C as the said sprocket-wheel Q takes up the links of the chain R until the shaft G is moved within a short distance of the inner jack-screw, D′. The frame A is then raised a short distance on suitable props, so that the said rods become free and are moved forward, at the same time shifting the jack-screws D, D′, and D^2 again, so that the rear jack-screw, D, is near one end of the main frame A, while the other jack-screws, D′ and D^2, are a suitable distance away from the main frame A, after which the sprocket-chain R is again secured by its outermost link to the jack-screw D^2. The props under the main frame A are then removed, so that the entire machine can again travel on the rod C, as above described.

The air admitted to the shaft G and the drill-tool H keeps the latter cool, and in case the cutters I become dull from wear the entire tool H is unscrewed from the shaft G and a new one is inserted. The cutters I can easily be sharpened and replaced when entirely worn out.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A mining drill-tool consisting of a longitudinally and transversely apertured conical screw provided with cutters, substantially as described.

2. A mining drill-tool consisting of a conical screw having a central longitudinal aperture and a series of transverse apertures leading from the longitudinal aperture and provided with a series of removable cutters secured in the threads of the screw, substantially as herein shown and described.

3. In a mining-drill, the combination, with a drill-supporting frame mounted on wheels or rollers, of jack-screws provided with side bearings, and rods or bars supported in said bearings and forming a track for supporting the said frame, substantially as herein shown and described.

4. In a mining-drill, the combination, with a track and a frame mounted on rollers and traveling on said track, of an engine carried by the frame, a transverse cutter-shaft operated from the engine, a sprocket-wheel operated from the cutter-shaft, and a sprocket-chain having one end secured to a support and passing over the said sprocket-wheel and over guide wheels or pulleys, substantially as herein shown and described.

5. In a mining-drill, the combination, with fixed rods, of a frame adapted to slide longitudinally on the said rods, an engine located on the said frame and provided on its main shaft with a sprocket-wheel, a shaft mounted to rotate on the said frame and provided with a sprocket-wheel, an endless sprocket-chain passing over the said two sprocket-wheels, a drilling-tool having cutters and screw-threads and secured on the said shaft, a worm formed on the said shaft, a worm-wheel secured on a vertical shaft mounted in the said frame, said worm-wheel meshing in the said worm and also carrying a bevel gear-wheel, a bevel-pinion meshing in the said bevel gear-wheel, a shaft carrying the said bevel-pinion and mounted to rotate on the said frame, a sprocket-wheel secured to the said pinion-shaft, and a sprocket-chain passing over the said sprocket-wheel and having one end secured on a fixed point, substantially as shown and described.

JOHN PHILLIP PAYNTER.

Witnesses:
NELSON T. HAND,
J. H. WHETSTONE.