(No Model.)

# S. H. TACY.

## MINING MACHINE.

No. 346,328. Patented July 27, 1886.

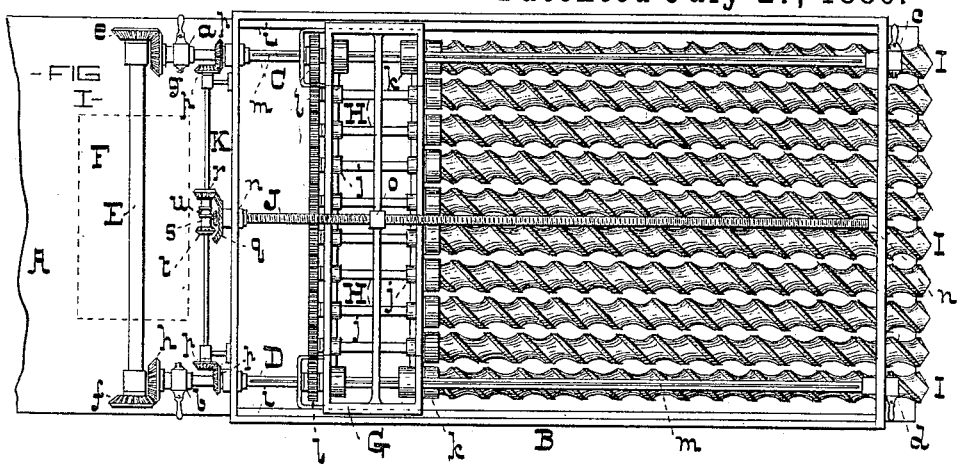

FIG I.

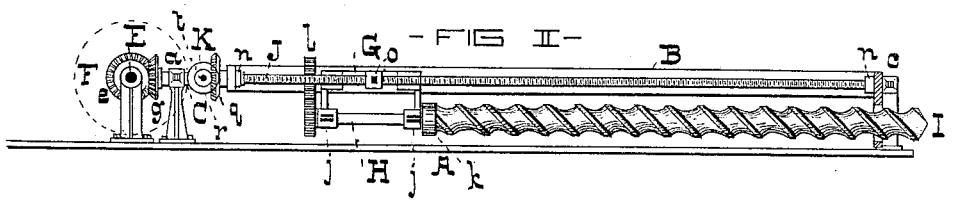

FIG II.

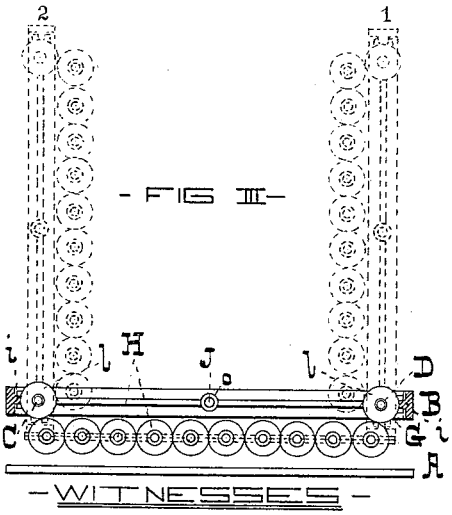

FIG III.

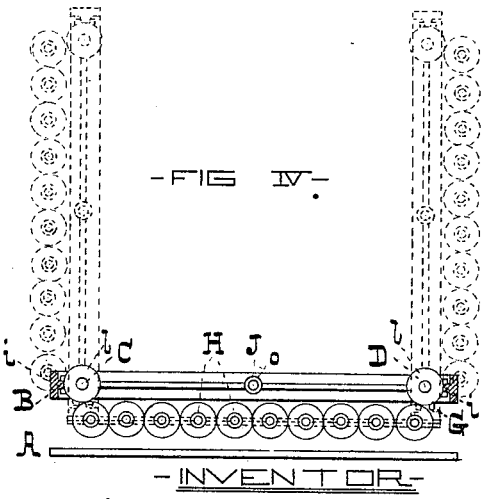

FIG IV.

WITNESSES

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# UNITED STATES PATENT OFFICE.

SAMUEL HENRY TACY, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO JAMES BOYCE, OF BALTIMORE, MARYLAND.

## MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 346,328, dated July 27, 1836.

Application filed January 27, 1885. Renewed May 11, 1886. Serial No. 201,892. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL HENRY TACY, of the city, county, and State of New York, have invented certain Improvements in Coal-Mining Machines, of which the following is a specification.

This invention relates to certain improvements in that class of coal-mining machines in which a series of revolving drills or augers are collectively forced by means of suitable feeding mechanism into the coal-vein.

The said invention consists in a peculiar construction and arrangement of certain parts of the machine, whereby the series of drills may be changed from a horizontal to a vertical position without affecting or changing the position of the bed.

In the further description of the said invention which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure I is a plan or top view of the improved machine. Fig. II is a longitudinal side section of the same. Fig. III is a transverse section of the machine, illustrating the manner in which the vertical cut is obtained. Fig. IV is a similar view to Fig. III, showing another arrangement for effecting the vertical cut.

In the said drawings, A is the bed-plate of the machine, which may be adapted to rest on blocks or be provided with truck-wheels, as preferred.

B is a rectangular frame, of any suitable construction, supported from the bed-plate A by means of the rotary shafts C and D, which rest in bearing-boxes *a*, *b*, *c*, and *d*, situated at the upper ends of suitable legs. The shafts C and D receive their rotary motion from the driving-shaft E, which constitutes the armature-shaft of an electric motor, (shown in dotted lines and denoted by F,) and the means of communication between the said shafts consist of the miter-gears *e*, *f*, *g*, and *h*.

G is a carriage supported on rails *i* in the frame B, and adapted to be moved longitudinally of the said frame through the medium of feeding mechanism hereinafter described.

H H are spindles fitted to revolve in boxes *j* on the carriage G, and each spindle is provided at its forward end with a socket, *k*, into which is inserted and fastened a drill or auger, I.

The means whereby the drills or augers are collectively rotated without respect to the longitudinal position of the carriage in the frame B consist as follows: The shafts C and D have each a spur-wheel, *l*, which revolves with it, in view of the shaft having a feather, *m*, extending lengthwise thereof. These spur-wheels are in gear with a system of similar wheels on the spindles H H, which engage with each other, as shown in Figs. I and II. The feeding devices consist of a feed-screw, J, having bearings *n* in the frame B, and a nut, *o*, secured in the carriage G. This feed-screw is revolved so as to feed the drills from the shafts C and D by means of a shaft, K, the miter-gears *p*, and the beveled wheel *q*, with its pinion *r*, and in a direction to withdraw the said drills after the completion of the cut by the said miter-gears *h* and the mitered wheels *s* and *t*. To admit of this reversal in direction of rotation of the screw J the pinion *r* and the miter-wheel *t* are fastened to a sleeve, *u*, which is adapted to slide on a feather in the shaft K, and the sleeve has a lever or other device (not shown,) whereby it can be moved to bring either the pinion *r* and beveled wheel *q* or the mitered-wheels *s* and *t* in gear. By this arrangement of gearing the drills can be fed at such speed as will effect the proper performance of their functions in the drilling operation, and then, by merely shifting the sleeve *u*, they are withdrawn at a much greater speed, thus saving time and increasing the capacity of the machine.

In the foregoing the machine is described as with its parts relatively arranged to effect an under or horizontal cut only, and to fully understand the changes necessary to produce a vertical cut reference must be had to Figs. III and IV.

Referring particularly to Fig. III, it will be seen that the frame and carriage are shown in a horizontal position in full lines and in their vertical positions in dotted lines. To effect this change it is necessary to throw back the caps of the bearing-boxes *a* and *c*, or the caps of the similar boxes, *b* and *d*, which caps are

hinged and provided with handles. When the caps *a* and *c* are thrown back, the frames can be lifted so as to present the appearance shown by their dotted delineation, marked 1, the shaft D merely turning in its bearing-boxes *b* and *d*. The drills can now be set in motion to effect a vertical cut at the right-hand side of the mine, and the power is derived entirely from the miter-gears *f* and *h*, the corresponding ones, *e* and *g*, being inoperative. After the completion of this vertical cut the drills are withdrawn from the vein, and the frame, with its carriage and drills, first lowered to a horizontal plane and then lifted in a reverse direction, so as to present the appearance shown by their dotted delineation, marked 2. While the left-hand vertical cut is being performed the miter-gears *f* and *h* are inoperative, and the ones *e* and *g* operative, as will be readily understood. It will be seen that in changing the position of the frame and its attachments from the horizontal to either of the vertical positions the operation of the feed mechanism is not interfered with.

It will appear by referring to Fig. III that in view of the drills occupying a position below the shafts C and D the distance between the vertical cuts is necessarily less than the width of the under or horizontal cut and a loss of coal at the sides of the mine is the result. This is obviated in Fig. IV, in which the frame is shown in dotted lines, with the drills outside of the frame. To obtain this change in the relative positions of the frame and drills it is only necessary to lift the said frame and its attachments bodily from one side of the bed-plate to the other, and this can be easily accomplished, as the weight of the parts to be lifted and transferred is inconsiderable.

The machine is fitted with locks (not shown,) to hold the frame firmly when in any of the vertical positions described.

To admit of the rotation of the feathered shafts C and D in their bearing-boxes on the frame B they are provided with slotted cylindrical sleeves, which turn with the shafts in the boxes.

I claim as my invention--

In a coal-mining machine, the combination of a fixed bed plate, a frame carrying drills pivoted to and supported by the said bed-plate, adapted to be elevated at one side thereof independently of the said bed-plate, to bring a line extending transversely through the series of drills from a horizontal toward a vertical position, and one drill above another, and means to effect the rotation of the said drills, substantially as and for the purpose specified.

SAMUEL HENRY TACY.

Witnesses:
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