D. W. SIPRELL.

Coal Mining-Auger.

No. 203,785. Patented May 14, 1878.

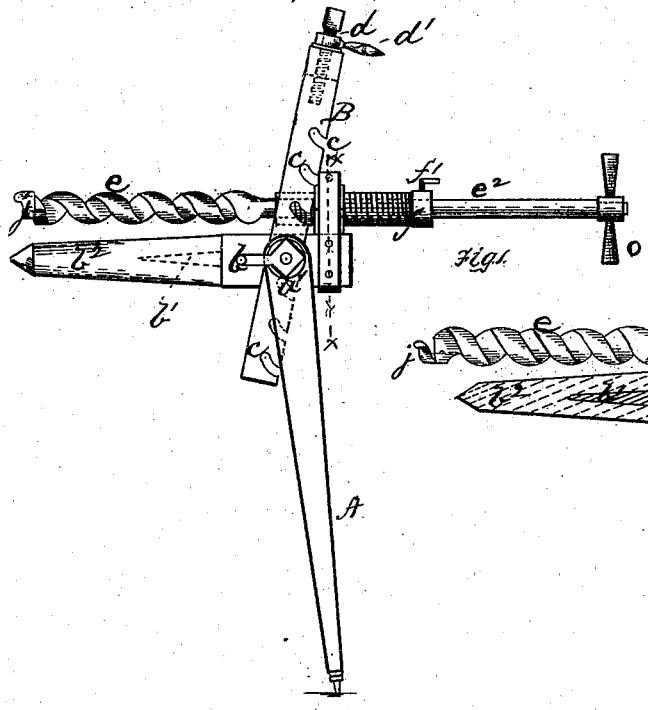

Fig. 1.

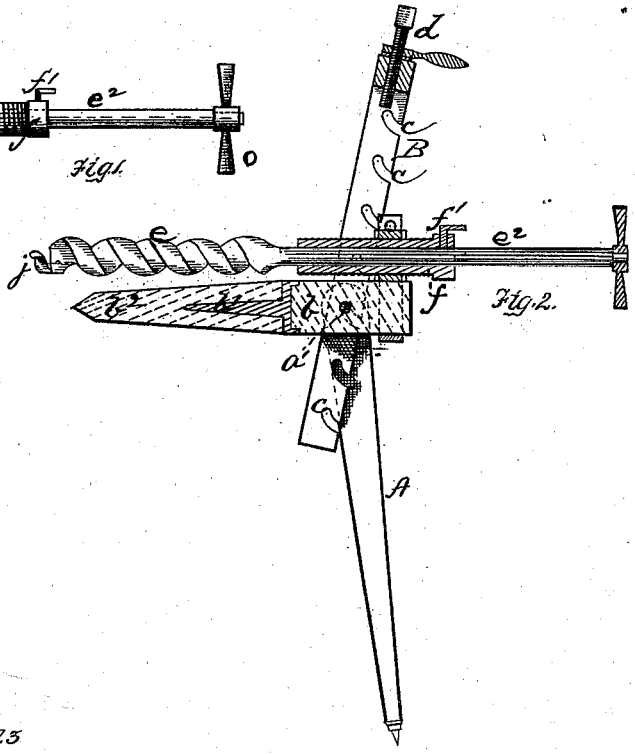

Fig. 2.

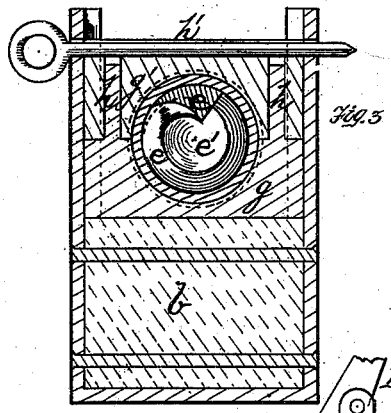

Fig. 3.

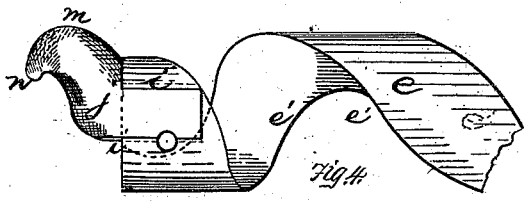

Fig. 4.

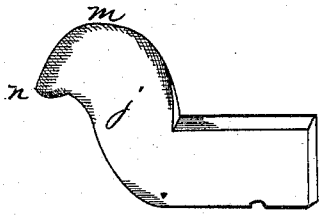

Fig. 5.

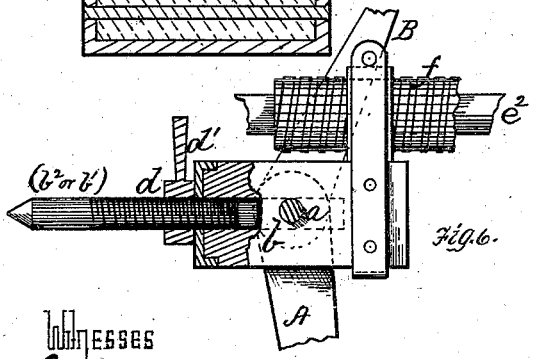

Fig. 6.

WITNESSES

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UNITED STATES PATENT OFFICE.

DARIUS W. SIPRELL, OF MONONGAHELA CITY, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND WILLIAM H. MORRISON, OF SAME PLACE.

IMPROVEMENT IN COAL-MINING AUGERS.

Specification forming part of Letters Patent No. **203,785**, dated May 14, 1878; application filed April 18, 1878.

To all whom it may concern:

Be it known that I, DARIUS W. SIPRELL, of Monongahela City, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Coal-Mining Augers; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side elevation of devices embodying my invention. Fig. 2 is a longitudinal central section of the same. Fig. 3 is a transverse section on the line *x x*, Fig. 1, enlarged. Fig. 4 is a detached view of the cutter and part of the auger enlarged. Fig. 5 is a detached view of the knife. Fig. 6 is a modification of the truss-frame.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of augers for mining purposes, and to truss or frames for supporting the same; and consists, first, in forming the cutting-bit of the auger eccentric, so that its cutting-edge continually leads and cracks off as well as cuts the material into which it enters; secondly, in a truss or support adapted to bear against the face of the coal or like surface, and on two or more points in rear of the point of resistance, whereby a firm and adjustable support for the auger is obtained; thirdly, in combining, with the auger and its support, a threaded sleeve and partible nut, whereby the auger can be advanced or detached at will; and, finally, in details of construction, hereinafter specified.

Heretofore in the construction of augers and frames or supports therefor a vertical adjustable post has been employed and a detachable bit; but in no case, so far as I am aware, has a truss-frame been employed.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In the drawing, A A indicate the legs or two lower supports of the truss, which are pivoted at *a* to the main frame *b*, which has a central point, b^1, forming a peg, whose function will be hereinafter specified. To the point b^1 is affixed a supplemental point, b^2, which, in the ordinary use of the frame, bears against the face of the coal. *b* indicates the main frame, on which the auger rests. This frame has secured thereto one-half of a section of the nut for the screw-sleeve of the auger. On the bearings of the main frame *b* and legs A A is a ratchet or rack frame, B, which has a series of notches, *c*, at regular distances, so that it can be raised or lowered, according to the elevation desired for the auger. In either the bearing or main frame *b* or the ratchet-frame B, as the case may be, (see Figs. 1, 2, and 6,) is a threaded rod or screw, *d*, provided with a nut or equivalent device, *d'*, by means of which the rod or screw can be projected or withdrawn, at pleasure, when setting the truss or frame.

e indicates the auger, which is in the form of an open spiral, with central clearing-space e^1 for the passage of the dust. The extremity of the spiral *e* is provided with a dovetailed groove, *i*, for the reception of the detachable knife *j*, which is secured by a small pin, *k*, preferably of wood.

j indicates the detachable knife or bit, which is curved somewhat eccentrically, projecting, when in position, beyond the twist, as at *m*, and leading by the point *n*. The pitch of the knife on the auger is such that it cuts a circle raised toward the center, and the coal, being bound at the circumference, breaks to the center, owing to the eccentricity of the knife. The operation of the knife results in the cracking off as well as cutting the coal.

The stem e^2 of the auger passes through a sleeve, *f*, threaded on its outer surface, and is secured therein when adjusted by means of a set-screw, *f'*.

f is a screw-sleeve, mounted on frame *b* by means of a divisible nut, one half of which, *g*, is secured to said frame, and the other half, *g'*, is guided to position by pegs *h* and detachably secured by a pin, *h'*, or equivalent device. This sleeve gives the forward feed of the auger and adjustment for depth of boring, and is preferably of such exterior diameter relatively to the twist or spiral as will permit it to follow into the hole, if required so to do.

The operation of my device is as follows: The legs A A (which should be proportioned to the height of the rooms wherein the auger

is to be employed) are set at such an angle as will bring the main frame *b*, with its auger, to the desired height opposite the face of the coal. The point rests against the face of the coal, and the rack-bar B is adjusted by notches *c* so as to bring its upper or screw end near to or against the roof. Said rack-bar or upper brace B having been set at the desired angle, the nut *d'* is operated to force the screw-rod *d* against the roof or wall, thus securing the frame in position. The auger having been properly adjusted in the screw-sleeve, and secured thereto by the set-screw, the power may be applied either through well-known gearing (not shown) or by means of the handle *o;* and, when the auger has entered as far as the screw-sleeve can advance through nut *g g'*, if it is desired to bore deeper, the set-screw may be loosened, the section *g'* lifted, and the sleeve drawn back, and again secured to the auger by set-screw, and to the frame *b* by replacing section *g'* of the nut. The auger can be withdrawn from the hole by a straight pull at any time when the set-screw has been turned to release it from the sleeve.

When it is desirable to set the truss or frame nearer to the face of the coal, either to bore a deeper hole or for any other reason, the detachable point can be removed, and the peg or point brought up to the face of the rock.

The adjustment of the truss to raise or lower the auger, or to suit the varying height of the passage, can be made by the bracing angle given to legs A A and top brace or rack-bar B and by the notches *c* of the latter.

The knife, in its operation, cuts a circle on the outside of the hole a little raised toward the center and a little advanced on the center, the coal thereby being raised a little, causing it to break toward the center, where it finds free escape. The ragged surface left by the clearage or crumbling of the coal is sheared or smoothed by the following cut of the knife.

In Fig. 6 the screw-rod *d* and nut *d'* are shown as placed on the main frame *b*, and supplying the place of point; and it may be here stated that the extension-rod *d* specified may be placed on any of three braces forming the truss without change of function, and to suit the fancy or object of the constructor.

The advantages derived from my invention are, first, the spiral-twist auger forms a continuous thread, obviating all pressure of the dust against the sides of the hole while boring; secondly, the space in the center of the auger leaves a free space for the dust to pass; thirdly, the knife takes its cut according to the size of the thread, and follows in an unobstructed line according to the spiral twist of the auger; fourthly, the coal is cut and broken by the knife instead of ground off, as heretofore, whereby less power is required to drive the auger; fifthly, the form of the knife is such as to always present a fine point to the surface, as the circle of the knife back of the point is always under the point; sixthly, the form of the knife is such as to reduce the strain on the point, so that the point can be made very thin, and the miner is able to sharpen it when it becomes dull by rubbing it a few times with a small file; seventhly, the ready manner in which the knife is attached by means of a wooden peg enables it to be removed, sharpened, and replaced at pleasure, while its small cost enables a number of knives to be kept on hand; eighthly, the lightness and strength, together with the ease and rapidity with which it can be adjusted, are advantages of the truss, as is also the fact that the strain from the auger is on a center, with top and bottom bearings in rear thereof, so that the pressure of the screw that forces the auger converts the devices for supporting the same into a perfect truss, which becomes firmer as the pressure increases.

Having thus described my invention and the advantages thereof, what I claim, and desire to secure by Letters Patent, is—

1. The knife or bit for mining-augers, provided with the leading-point and circular eccentrically-projecting cutting-surface back of the point, substantially as specified.

2. The combination, with the auger and its frame, of the threaded sleeve, the auger being adjustable through and detachable from the sleeve, and the sleeve movable in and detachable from the frame, substantially as and for the purpose specified.

3. The combination, with the auger and its stem, of the threaded sleeve and set-screw for adjusting and securing the stem in the auger, substantially as specified.

4. The truss-frame for coal-mining augers, having the adjustable screw-rod arranged on one of its bearings, substantially as and for the purpose specified.

In testimony whereof I, the said DARIUS W. SIPRELL, have hereunto set my hand.

DARIUS W. SIPRELL.

Witnesses:

F. W. RITTER, Jr.,

R. H. WHITTLESEY.