P. SHELDON.

MACHINERY FOR MINING COAL.

No. 180,799. Patented Aug. 8, 1876.

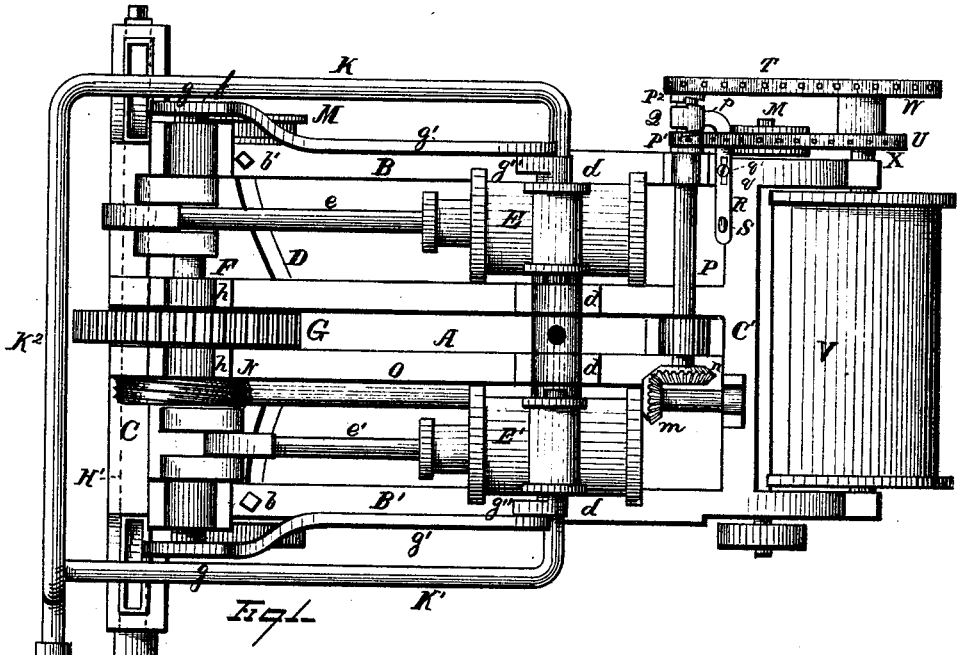
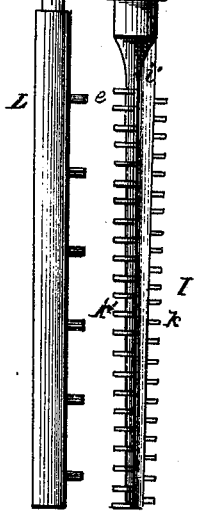


Fig. 1.



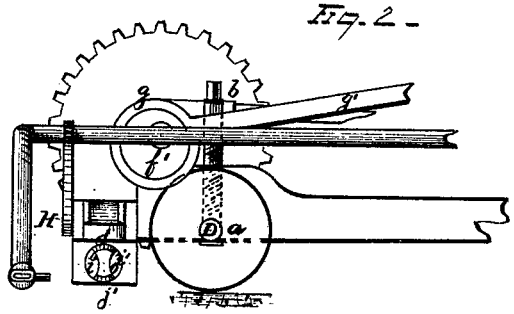
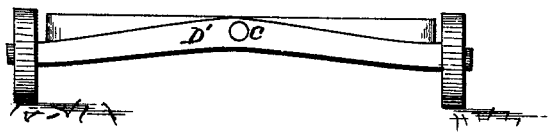


Fig. 2.

Fig. 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

PORTER SHELDON, OF JAMESTOWN, NEW YORK.

IMPROVEMENT IN MACHINERY FOR MINING COAL.

Specification forming part of Letters Patent No. **180,799**, dated August 8, 1876; application filed March 27, 1876.

To all whom it may concern:

Be it known that I, PORTER SHELDON, of Jamestown, Chautauqua county, New York, have invented certain Improvements in Machinery for Mining Coal, of which the following is a specification:

In the accompanying drawings, Figure 1 represents a plan view of the machine. Fig. 2 represents the side rail of the machine, with means for adjusting the axles relatively to the same. Fig. 3 shows the forward-axle attachment, to allow of the self-adjustment of the same.

My invention relates to that class of coal-mining machines for cutting coal that are moved along the breast of coal in the galleries of the mine.

The invention consists, first, in a tapering rotary cutter, formed with double plain or grooved faces; second, in a tapering rotary cutter, formed with double plain or grooved faces, and the adjacent curved faces constructed with wedge-shaped grooves for the reception of the cutters; third, in the combination, with a coal-mining machine, provided with fixed rear axles, of a pivoted forward axle to serve as a positive support for the machine on variable grades; fourth, the combination, with the winding-drum and a counter-shaft, of spur-wheels, endless chains, and a double clutch, to impart slow or rapid movement to the machine; fifth, in certain details of construction hereafter specified and claimed.

A is the machine-frame, having side rails B B′ and end rails or cross-bars C C′. The side rails are formed with rectangular slots or bearings *a*, within which the ends of the rear axle D are secured. Adjusting-screws *b b′*, squared at their upper ends for the application of a wrench, pass through the side rails, and are firmly attached to the ends of the rear axle. By turning the adjusting-screws the position of the frame carrying the revolving cutter may be adjusted as desired. To the forward cross-bar of the machine the forward axle D′ is pivoted, at its center *c*, so that the wheels, passing over an uneven surface, may yield and support the machine in any position. Oscillating engines E E′, having their trunnions suitably journaled in bearing-blocks *d*, impart a rotary motion to the double crank-shaft F through pistons *e e′*. Eccentrics *f f′* are secured to opposite ends of the crank-shaft F, and to each eccentric the eccentric straps *g* and connecting-rods *g′* are attached, while the opposite ends of the connecting-rods *g′* are attached to the cranks *g″* of oscillating valves, that serve to govern the entrance and exit of motive power to the engines E E′. To the double crank-shaft F, and between bearing-blocks *h h*, the main driving-gear wheel G is rigidly secured, and meshes with the cog-wheel H of the counter-shaft H′. The outer end of counter-shaft H′ is screw-threaded for the attachment of the rotary cutter I. Cutter-bar I is formed tapering from its inner end to its point, as shown, and has plain faces *i i′*. The form of the cutter is such that its strength is gradually increased with the leverage, and its weight decreased from its outer to its inner end, whereby the springing of the cutter-bar is, in a great measure, obviated, and also, through the medium of the cut-away or plain faces, the cutter-bar readily clears itself of the coal-cuttings accumulating in the cut in front of the same. The rounded faces *j j′* of the cutter-bar are provided with wedge-shaped grooves *k*, within which the cutters *k′* are firmly secured. Pipes K K¹ are attached to the outer trunnions of the oscillating engines through stuffing-boxes, or in any desired manner, and the said pipes connect with a rear cross-pipe, K², which is curved downward and screw-threaded at its outer end. A tapering pipe, L, having air jets or nozzles, is screwed on the end of pipe K². The engines are actuated by compressed air, and the exhaust is carried, through pipes K K¹ K², into the pipe L, from whence it escapes through the jets *l* and serves to force the coal-cuttings from about the rotary cutter and allow the same to work without any obstruction from the constantly-accumulating coal-cuttings. In order that the cutter may cut closely to the floor of the gallery, I use but a single or outside guiding-track for the machine, and provide the machine with double-flanged track-wheels M and plain or road wheels on the inner or cutting side of the machine. As the cutter-shaft is not obstructed by any track, but, on the contrary, moves near the floor of the gallery, the cutting-bar will cut the breast of coal close to or even with the floor, thereby saving the time and expense usually incurred

in cutting away a layer of coal above the floor that heretofore has been left standing by the coal-mining machines, as heretofore constructed. As heretofore stated, the cutter-bar may be vertically adjusted by turning the set-screws *b b'*, as they serve to vary the height of the frame from the road-wheels. Upon the crank-shaft F the worm-gear N is rigidly secured between the crank and central bearing-block. This worm-gear meshes with a cog-wheel on a longitudinal shaft, O, the same having end bearings in the front and rear cross-bars of the frame A. Upon the forward end of shaft O the bevel-gear wheel *m* is secured, the same meshing with bevel-gear wheel *n* of the transverse shaft P. The end of shaft P carries two loosely-journaled spur-wheels, P^1 P^2, and between these loose pulleys the double sliding clutch Q is secured to the shaft by a spline and groove. The double clutch is formed with a central groove, *p*, within which engages the end of the shifting-bar R, the same being provided with a slot, *q*, and attached to the frame by a screw or bolt, *q'*. An operating-lever, S, is pivoted at its lower end to the frame of the machine, and passes through an opening in the end of the shifting-bar R. Endless chains T U pass around the spur-wheels P^1 P^2 of the shaft P, and impart rotary motion to the winding-drum V through the large and small spur-wheels W X, which are rigidly secured to the axle of the drum. A rope is secured to the drum, and the opposite end of the rope is secured to some fixed object in the gallery of the mine.

When it is desired to feed the rotary cutter forward rapidly against the coal, the clutch is thrown in contact with the inner spur-wheel, and, as the endless chain on the same passes around the small spur-wheel X attached to the axle of the drum, the latter will be rapidly revolved, and, through the rope attachment winding on the drum, cause the machine to be drawn rapidly against the breast of coal.

A slow motion is obtained by shifting the clutch and causing it to engage with the outer pulley, the belt or chain of which passes around the large spur-wheel W of the drum.

To stop the machine, the clutch is thrown midway between the loose spur-wheels, when the drum will remain stationary.

I do not claim a coal-mining machine provided with outside flanged wheels and inside plain or road wheels, as this construction, broadly considered, is the invention of G. D. Whitcomb, and is shown in his patent dated January 18, 1876.

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

1. A tapering rotary cutter, formed with its opposite sides grooved or flattened, substantially as and for the purpose set forth.

2. The combination, with a tapering rotary cutter, having flattened faces, as described, of a series of cutters secured within wedge-shaped grooves formed in the curved faces of the cutter, substantially as and for the purpose specified.

3. The combination, in a coal-mining machine, of a rear stationary axle and a forward main axle centrally pivoted to the frame, substantially as and for the purpose specified.

4. In a coal-mining machine, the combination, with the winding-drum and a countershaft, of spur-wheels, a double clutch, and endless chains, to impart a slow or rapid movement to the machine, substantially as and for the purpose set forth.

5. In a coal-mining machine, the combination, with the spur-wheels P^1 P^2, W, and X, and endless chains T U, of the double clutch Q, shifting-bar R, and operating-lever S, substantially as and for the purpose set forth.

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Witnesses:

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