

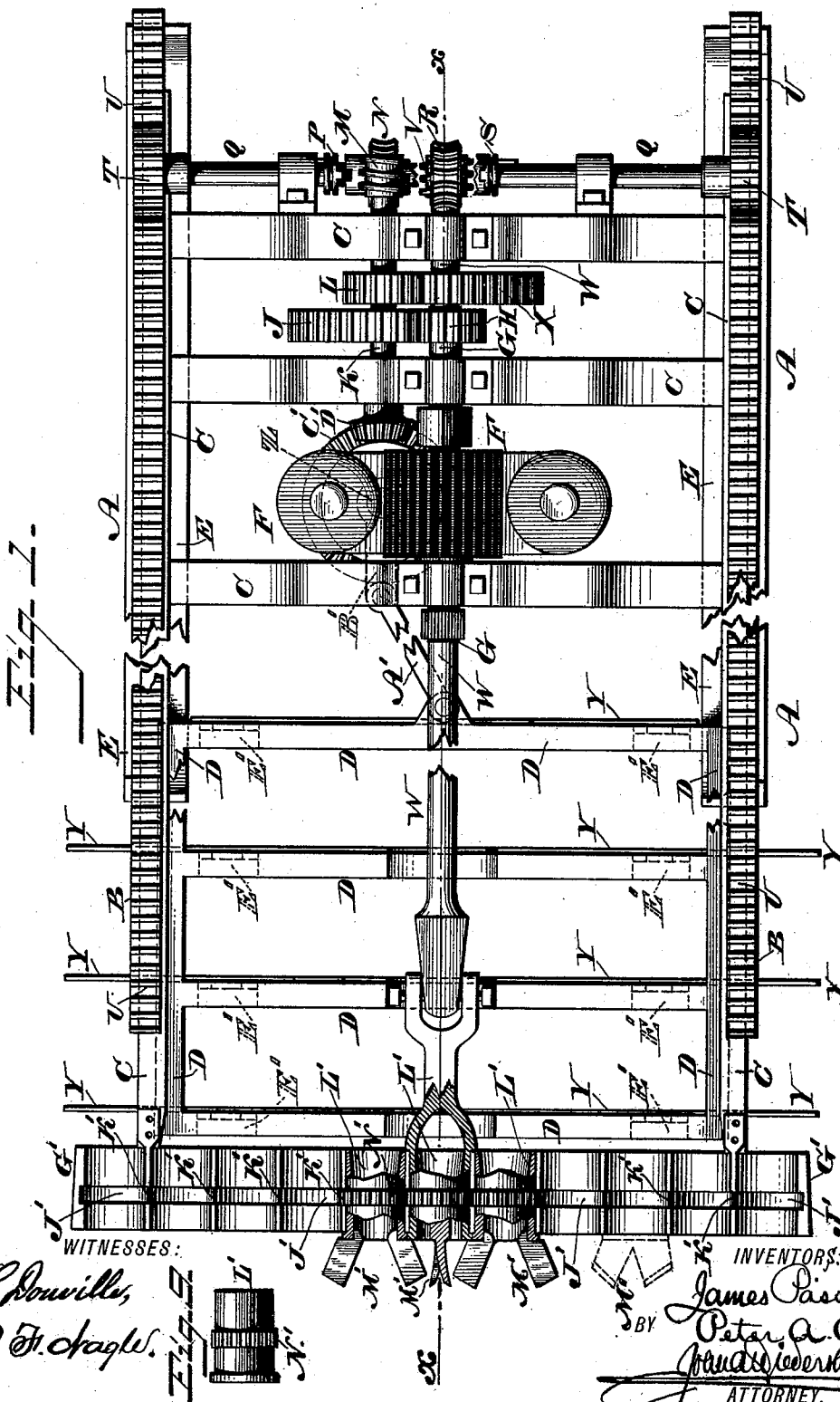
(No Model.)

4 Sheets—Sheet 1.

J. PASSMORE & P. A. ARP.
COAL MINING MACHINE.

No. 465,197.

Patented Dec. 15, 1891.



(No Model.)

4 Sheets—Sheet 2.

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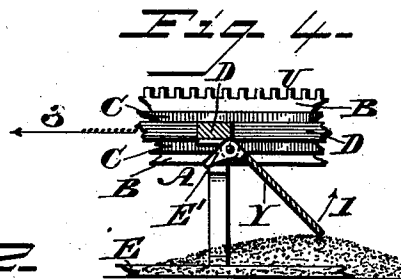
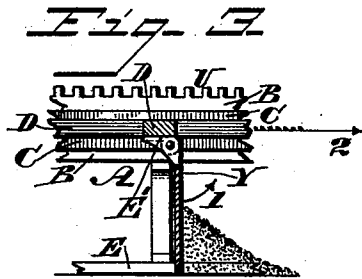
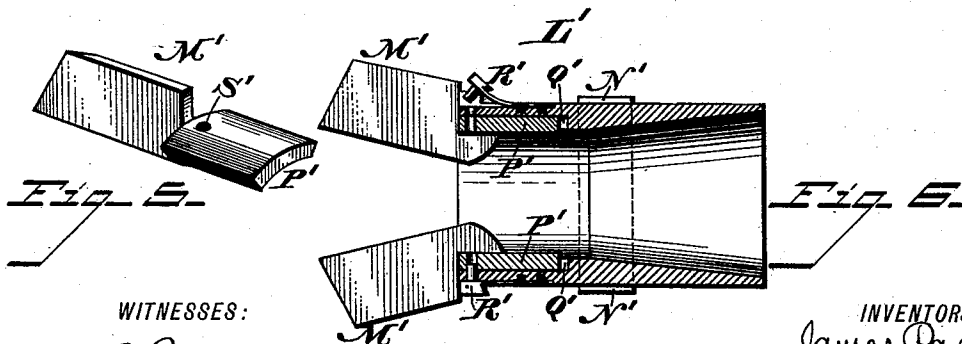
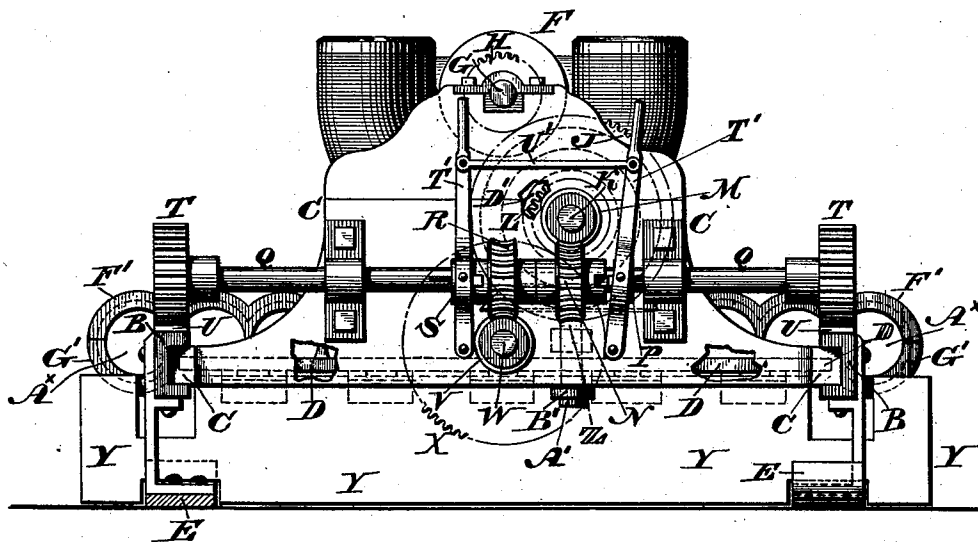


Fig. 2



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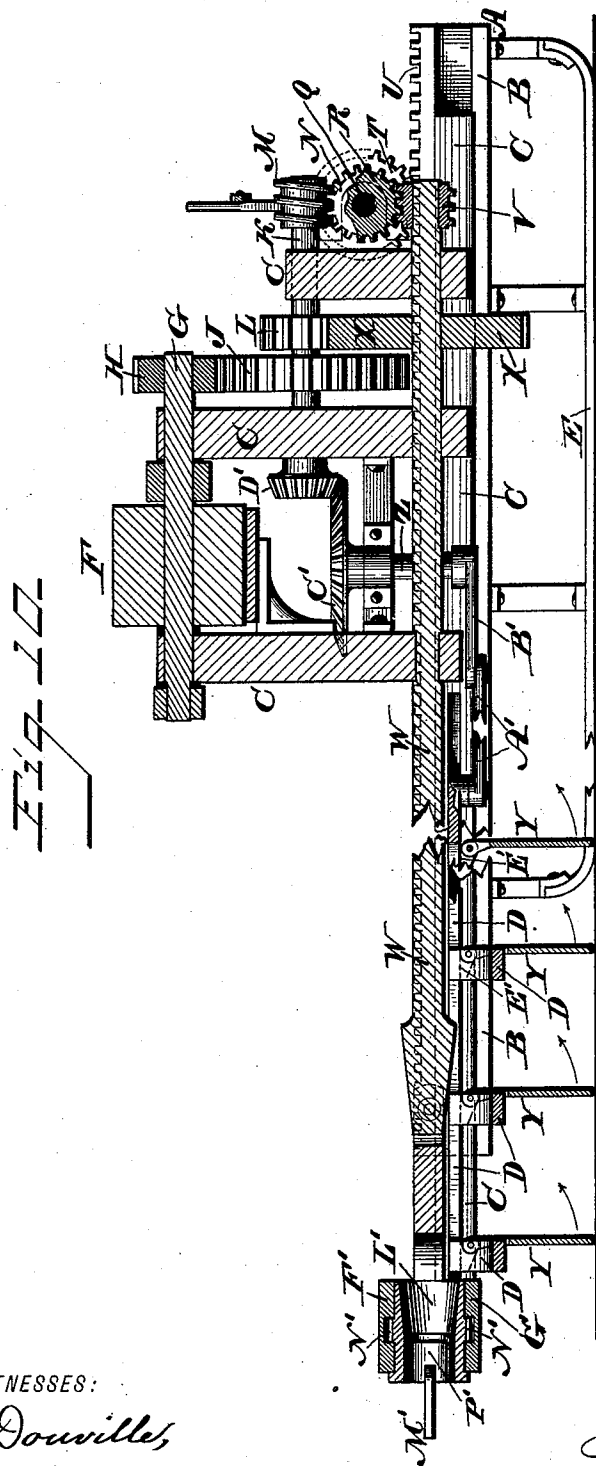
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4 Sheets—Sheet 4.

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WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES PASSMORE AND PETER A. ARP, OF PHILIPSBURG, PENNSYLVANIA.

COAL-MINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 465,197, dated December 15, 1891.

Application filed April 6, 1891. Serial No. 387,841. (No model.)

To all whom it may concern:

Be it known that we, JAMES PASSMORE and PETER A. ARP, citizens of the United States, residing at Philipsburg, in the county of Centre, State of Pennsylvania, have invented a new and useful Improvement in Coal-Mining Machines, which improvement is fully set forth in the following specification and accompanying drawings.

Our invention relates to improvements in coal-mining machines; and it consists of the combination of parts, as hereinafter set forth and described.

Figure 1 represents a plan view of a machine embodying our invention, partly broken away. Fig. 2 represents an end view, partly broken away, of the machine shown in Fig. 1. Figs. 3 and 4 represent vertical sections of detail portions of the machine, showing a scraper in different positions. Fig. 5 represents a perspective view of a bit or cutter on an enlarged scale. Fig. 6 represents a longitudinal section of a bit-holder with cutter therein. Fig. 7 represents a transverse section, on an enlarged scale, of the portion of the device for supporting the bit-holder. Fig. 8 represents a perspective view of a lower part of the casing with a bit-holder in position on the same scale as in Fig. 7. Fig. 9 represents a side view of a bit-holder on the same scale as Fig. 1. Fig. 10 represents a vertical longitudinal section on line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a frame consisting of uprights or supports, to the upper ends of which are secured the parallel guideways B, having racks on their upper sides. Movable in the guideways B is a frame C, which carries the operating mechanism and the cutting-tools of the device, and movable in ways on said frame C is a frame D, carrying a series of scrapers to remove the cut material away from the tool-holders. For convenience in moving the frame A, the uprights thereof are connected at their base portions with the shoes E, the latter consisting of strips or bars of suitable material adapted to rest on the ground and to be drawn over the same when moving the frame A.

Mounted on the frame C is a motor of any

suitable construction provided with the driving-shaft G, extending longitudinally of the machine. On the shaft G is a pinion H, which meshes with a gear-wheel J on a shaft K, parallel with the shaft G. The shaft K has also a gear-wheel L and worm M, the latter meshing with a worm-wheel N, loosely mounted on the counter-shaft Q, which is journaled on the rear portion of the frame C and provided with a clutch P, adapted to engage the worm-wheel N, so that the rotation of the latter will operate said shaft.

Mounted on the frame C and parallel with the shaft K, is a shaft W, having a gear-wheel X, meshing with the gear-wheel L, of the shaft K, and a worm V, meshing with a worm-wheel R, loosely mounted on the shaft Q and adapted to be rotatably connected therewith by a clutch S on the said shaft.

Secured to the front end of the frame C is a casing consisting of an upper section F' and a lower section G', having on their inner walls the grooves H' J', respectively. The said sections, when joined, form a series of chambers A^x with openings K' in their partition-walls. The chambers A^x are adapted to receive the tubular bit-holders L', having the peripheral cogs N' thereon, which engage each other in the openings K' and rotate in the grooves H' J'.

M' designates boring-bits, each formed of a cutting-blade provided with a shank portion P', adapted to be fitted in any one of a series of grooves Q' in the holder L', and secured thereon by means of a spring-catch R', which enters an opening S' in said shank.

The central tool-holder is so connected to the end of the shaft W as to be adapted to be rotated thereby, its rotation operating the other tool-holders by means of the cogs N'.

The scrapers Y, which are formed of a series of plates extending across the device, are pivotally mounted on the under side of the frame D, and are provided with angular projections forming the shoulders E', adapted to abut against the under side of the said frame, so as to permit the swinging or oscillation of the scrapers on only one side of the vertical line of the pivotal connection of the scraper with the frame.

To reciprocate the frame D so as to oper-

ate the scrapers Y, the following mechanism is employed: A vertical shaft Z, suitably journaled in the frame C, has a bevel gear-wheel C', meshing with a bevel gear-wheel D' on the shaft K, and is provided with an arm B', which is connected by a link A' with the frame D, whereby the rotation of said shaft and arm reciprocates the said frame D.

T' designates levers which are pivoted at their lower ends to the frame C and connected with the clutches P and S, so as to be adapted to operate the same. A bar U' connects the two levers, so that the same will be operated simultaneously.

The manner of operating the machine is as follows: Motion being imparted to the driving-shaft G, the clutch S being in engagement with the worm-wheel R and the clutch P being free from the worm-wheel N, the rotation of the said shaft will by means of the pinion H and the meshing gear-wheel J rotate the shaft K and its gear-wheel L, thus rotating by means of the wheel X the shaft W and the tool-holders L'. At the same time the rotation of the worm V rotates the worm-wheel R and thereby the shaft Q, so that the wheels T thereon rotate on the racks U of the guideways B, thereby advancing the frame C toward the bank of coal or other material which is being bored. During these movements the bevel gear-wheel D', meshing with the bevel gear-wheel C', causes the rotation of the shaft Z and the arm B', and thereby by means of the link A' reciprocating the frame D, thus operating the scrapers Y, the movement of the frame D in the direction of the arrow 2, Fig. 3, or away from the cutting-tools, pushing the cut material from the holders L', and the movement of the frame in the direction of the arrow 3, Fig. 4, or toward the cutters, permitting the riding of the scrapers over the cut material. When the frame C has advanced to its limit or to the end of the rack U, the clutches S and P are shifted by means of the levers T', so that the rotation of the worm-wheel N, connected with the worm M, rotates the shaft Q in the opposite direction from that rotated when operated by the connection of the worm-wheel R with the worm V. This movement withdraws the boring-tools from the coal and returns the frame C to its first position on the frame A, or as shown in Fig. 1. The latter frame, with its shoe E, can then be moved closer to the bank for further boring, or, if desired, to any other place.

It will be seen that the operation of the scrapers, owing to their arrangement in a row, as shown, removes the cut material by successive steps away from the bit-holders, the first scraper removing a portion a short dis-

tance, and each successive scraper moving the same portion a farther distance.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A coal-mining machine having a main frame with parallel guideways secured thereto and provided with racks on their upper sides, a sliding frame movable in said guideways and having gears engaging said racks, a series of cutting-tools carried by said sliding frame and having intermeshing gears inclosed by a casing, a single longitudinal central shaft connected to the central tool for actuating the entire series of tools, operating mechanism for said shaft and remaining parts of the device, and a frame movable in ways on said second or sliding frame and carrying a series of scrapers extending across the machine, said parts being combined substantially as described.

2. A coal-mining machine having a main frame, a frame movable in guides thereon and having a driving-shaft mounted longitudinally of the machine and with a pinion thereon, a shaft parallel with said driving-shaft, carrying a pinion meshing with said first pinion and a gear-wheel and worm, a counter-shaft with a worm and wheel loosely mounted thereon and meshing with said worm, a clutch on said counter-shaft, adapted to engage said worm-wheel, a second shaft parallel with the driving-shaft, having a gear-wheel thereon meshing with the first gear-wheel, and a worm meshing with the worm-wheel on the counter-shaft, having a clutch connection therewith, said parts being combined substantially as described.

3. In a coal-mining machine, a tubular bit or tool-holder having a grooved portion on one end of its inner wall, adapted to receive the sector-shaped shank of a bit, and a spring-catch having a pin adapted to enter openings in the said holder and shank, said parts being combined substantially as described.

4. A coal-mining machine having a frame consisting of uprights with parallel guideways on their upper ends, racks on the upper sides of said guideways, the frame C, movable in said guideways and carrying the operating mechanism and cutting-tools of the machine, and the frame D, movable in ways on said frame C and carrying a series of scrapers, said parts being combined substantially as described.

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