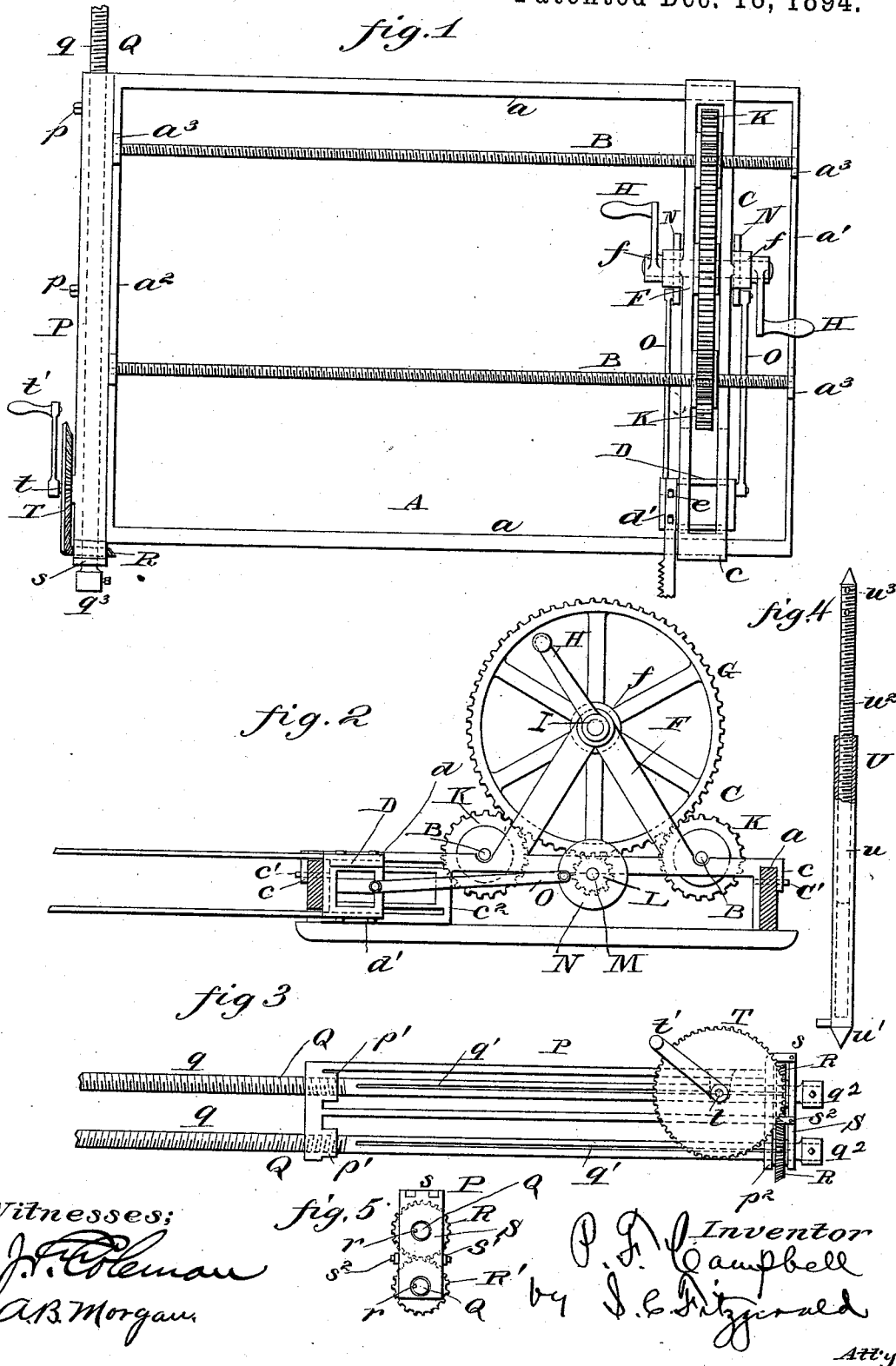


(No Model.)

P. F. CAMPBELL.
COAL MINING MACHINE.

No. 531,019.

Patented Dec. 18, 1894.



UNITED STATES PATENT OFFICE.

PATRICK F. CAMPBELL, OF PORTAGE, PENNSYLVANIA.

COAL-MINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 531,019, dated December 18, 1894.

Application filed March 23, 1894. Serial No. 504,856. (No model.)

To all whom it may concern:

Be it known that I, PATRICK F. CAMPBELL, a citizen of the United States, residing at Portage, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Coal-Mining Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in coal mining machines.

The object of my invention is to produce a hand power machine which may be used for drilling and then for sawing, and which will be simple, compact and easily operated.

With these objects in view my invention consists of such features, details of construction and combination of parts as will first be described in connection with the accompanying drawings, and then particularly pointed out in the claims.

In the drawings—Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is an end elevation of the same, showing in particular the sawing mechanism. Fig. 3 is a similar view of the opposite end of the machine showing the drilling mechanism. Figs. 4 and 5 are detail views to be referred to hereinafter.

Referring to the drawings, A is a bed frame consisting of side pieces a united by end pieces a' and a'' . Each end piece is provided with a pair of boxes a^3 and in these boxes are fixed a pair of screws B which extend lengthwise of the machine.

C is a saw-frame mounted transversely on the bed-frame A and capable of movement in the direction of movement of the said bed-frame. The saw-frame is provided with flanged ends c which overlap the side pieces a of the bed-frame and may be secured thereto by pins, bolts or set screws as shown at c' which pass through holes in the flanged ends and enter holes in the sides of the side pieces a . The saw-frame C, is also provided with a downward-extending guide-frame c^2 in which moves a reciprocatory head D provided with sockets d to receive the inner ends of the saw blades E, which are held in the sockets by set screws e .

To the top side of the saw-frame C are secured a pair of standards F provided with journals f at their tops, in which is mounted a driving gear wheel G operated by means of the hand cranks H attached to the ends of the shaft I on which the gear wheel G is fixed. On the longitudinal screws B are mounted the internal threaded gear pinions K which mesh with the gear wheel G and serve to move the saw frame in the direction of the length of the bed-frame.

A small gear-pinion L is fixed on a shaft M journaled in the saw-frame, this gear-pinion L meshing with the driving gear wheel on its under side. To the shaft M are fixed the crank-wheels N, which impart motion to the reciprocatory head D by means of connecting rods O, as will be plain from the drawings. On the bed-frame is also mounted a drill-frame P which is capable of movement in the direction of the length of the frame and may be placed at either side of the saw mechanism, being clamped to the side frame by bolts p .

In the drill frame are mounted two drill spindles Q which are each threaded for a considerable distance at one end q , the other ends being provided with slots q' . The threaded ends are screwed into internally threaded boxes or nuts p' forming part of the drill frame, while the opposite ends pass through boxes p^2 also formed in the drill frame. On the grooved ends of the spindles are mounted the oppositely-beveled gear-wheels R, R' which are each provided with feathers, r , for engagement with the respective slots q' in the spindles. The forward end of the spindles, Q, are provided with chucks q^2 arranged to receive suitable boring bits or drills.

To retain the bevel wheels R, R', in place on their respective spindles a hinged yoke S is provided being hung to the drill frame at s and normally held in its closed position by the straps s' which are secured to the yoke and to the drill frame by bolts s^2 . For the purpose of rotating the bevel pinions R, R', a large bevel wheel T is employed being mounted on a shaft t journaled in the drill frame, and provided with a crank t' by means of which the gear wheels may be rotated.

In using my improved apparatus the bed frame is laid upon the floor of the entry or

room and is held down securely by means of jacks U one of which is shown in Fig. 1. These jacks consist of internally threaded tubes or pipes u provided with nipples u' at their lower end, into which tubes are inserted the long screws u^2 having holes u^3 through which a bar may be passed for turning the screws, as will be fully understood by those skilled in the art, the nipples u' being held by a short piece of pipe to prevent rotation of the tubes.

When the machine is set in place, the drilling mechanism is operated by turning the hand crank, t , thereby drilling a pair of large holes into the coal seam, the drills being automatically fed to the coal by the revolution of the spindles, through the medium of the threaded ends q and internally-threaded boxes p' . After the holes are drilled, the drilling mechanism is moved to one side and the pair of saws inserted into the holes one saw in each hole, the distance apart of the saws being equal to the distance apart of the drills on the drilling device. The saws are now reciprocated by turning the driving gear wheel G thus sawing two kerfs in the coal, the saws being fed along the direction of the length of the bed-frame by the revolutions of the internally-threaded pinions K which are rotated by the screws B by the driving gear-wheel G.

When a sufficient length of kerf has been sawed the coal between the two kerfs is removed in any desired way and the coal above the opening is thrown down by blasting in the usual way as will be fully understood by those skilled in the art.

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

1. The combination with a rectangular bed frame A, of the said frame C, mounted on said frame A and movable longitudinally thereof, said frame C having a depending guide frame arranged adjacent to and aligned with one of the side pieces of said bed frame, a cross head, guided and movable on said guide frame, and aligned with the side piece of the bed frame, saws, secured to said cross head on opposite sides of said side piece of the bed frame and projecting at right angles to said side piece, means for moving said saw frame longitudinally on the bed frame and means for reciprocating said cross head, substantially as set forth.

2. The combination with a rectangular bed frame, of the paralleled feed screws, collared at opposite ends thereof, a saw frame provided with openings having flanged ends adapted to take over the side pieces of the bed frame, a driving gear wheel mounted on the saw frame, internally threaded gears mounted on the feed screws and projecting through the opening in the saw frame into

engagement with the driving gear wheel, a guide frame depending from the saw frame adjacent to and in alignment with one of the side pieces of the rectangular frame, a cross-head guided on and movable on said guide frame and aligned with the side piece of the bed frame, saws secured to said cross-head on opposite sides of and projecting at right angles to said side piece of the bed frame, a crank wheel rotatively mounted in the saw frame and connected to the cross head, and a gear wheel fixed to said crank wheel in engagement with the driving wheel, substantially as described and for the purpose set forth.

3. The combination, with a bed frame, of a pair of feed screws fixed in the bed frame, a saw frame movable on the bed frame and provided with flanged ends, a securing device attached to each flanged end, a pair of internally threaded gear wheels revoluble on the feed screws and located in the saw frame, a guide frame extending downward from the saw frame, a reciprocatory head movable in the guide frame and provided with saw receiving sockets, a driving gear wheel mounted in the saw frame and engaging the internally threaded gear wheels on the feed screws, means for operating the driving gear wheels, a connecting rod attached to the reciprocatory head, a crank wheel to which the connecting rod is attached and means for conveying motion from the driving gear wheel to the crank wheel, substantially as described and for the purpose set forth.

4. The combination, with a bed frame, a drill frame removably secured to the bed frame and provided with journal boxes and threaded boxes, a pair of spindles each threaded at one end and slotted at the other end, the threaded end passing through internally threaded boxes on the drill frame and the slotted ends passing through journal boxes in the drill frame, and a pair of oppositely beveled gear pinions mounted on the slotted ends of the spindles and provided with feathers entering the slots in said spindles, the bevel pinions being in mesh with each other, of a swinging yoke hinged to the drill frame and normally holding the bevel pinions in place, means for locking the yoke in its normal position, a chuck on each spindle, a bevel driving wheel revolubly attached to the frame and meshing into one of the bevel pinions, and a crank attached to the bevel driving wheel, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

PATRICK F. CAMPBELL.

Witnesses:

P. MCGOUGH,
D. W. MARTIN.