(No Model.) 2 Sheets—Sheet 1.

A. J. & J. T. BAGGS.

COAL MINING MACHINE.

No. 305,994. Patented Sept. 30, 1884.

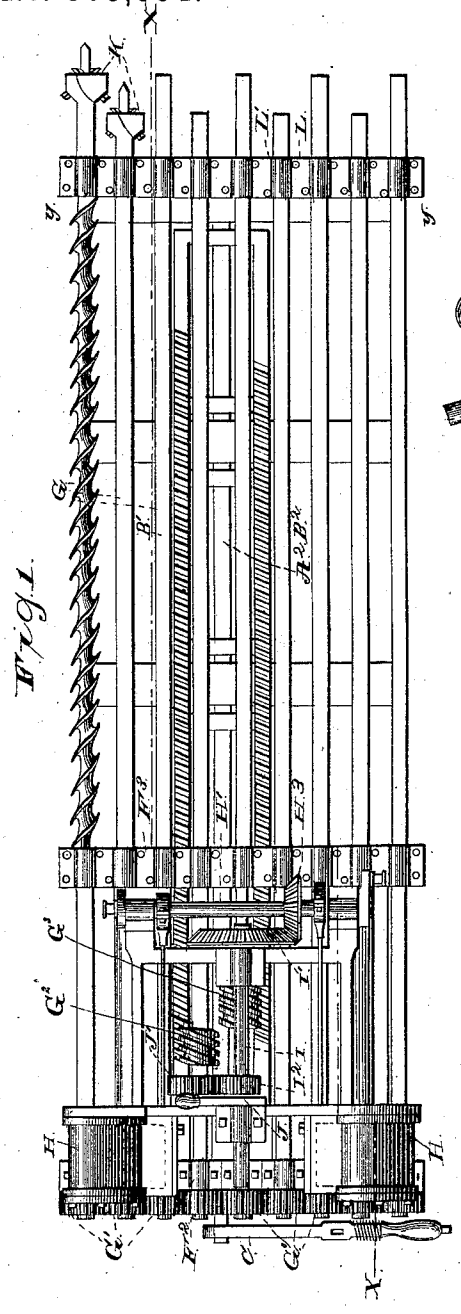


Fig. 1.

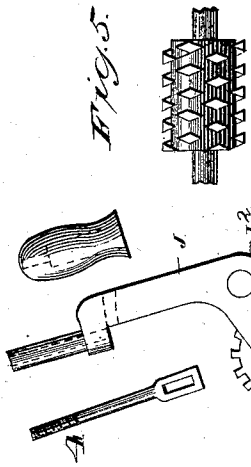


Fig. 4.

Fig. 5.

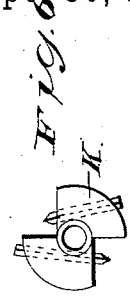


Fig. 6.

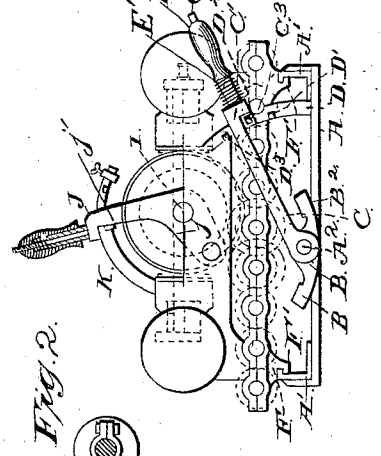


Fig. 3.



Fig. 2.

Fig. 7.

WITNESSES

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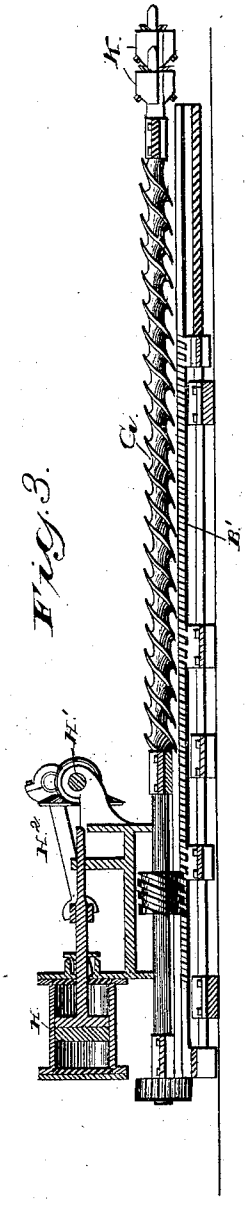


Fig. 3.

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UNITED STATES PATENT OFFICE.

ANDREW J. BAGGS AND JAMES T. BAGGS, OF BRIDGEPORT, OHIO.

COAL-MINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 305,994, dated September 30, 1884.

Application filed March 27, 1884. (No model.)

To all whom it may concern:

Be it known that we, ANDREW J. BAGGS and JAMES T. BAGGS, citizens of the United States, residing at Bridgeport, in the county of Belmont and State of Ohio, have invented certain new and useful Improvements in Coal-Mining Machines; and we do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to that class of mining-machines known as "inboring-machines;" and it consists in the novel construction, combination, and arrangement of the several parts, as will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a plan view. Fig. 2 is a rear elevation of our machine. Fig. 3 shows several of the parts in detail. Fig. 4 is a sectional view cut on about line *x x*, Fig. 1. Fig. 5 shows a modified form of worm-wheel. Fig. 6 is a detail of the cutter-head. Fig. 7 is a detached cross-section on line *y y*, Fig. 1.

The bed A is provided on opposite sides with L-shaped rails A′, on which the tool-carriage slides, in the manner presently described. The bed is also provided with a rod, A^2, which serves as a pivotal support for the rack-frame B. This rack-frame is formed with two side bars, B′ B^2, provided with teeth inclined in similar directions, as clearly shown in Fig. 1, and is pivoted midway between these bars, so that either one may be adjusted into engagement with its respective worm-wheel on the carriage. An operating-lever, C, is secured to this frame at its rear end. This lever is shouldered at C′, and is provided above said shoulder with a hollow shank, through which is inserted the stem C^2 of the loop C^3. This loop is placed over the segment-rack D, which is mounted on the base-frame and provided with notches D′ D^2 D^3. The handle E is placed over the hollow shank of the lever, and is screw-threaded at its outer end to the end of stem C^2, and a spring, E′, is arranged to bear between the inner end of the handle E and the shoulder C′ of the lever C. By depressing the handle or knob the cross bar or head of the loop may be pressed out of the notch in which it is rested and the lever be moved in either direction to any desired point, when the spring will draw the loop into engagement with the adjacent notch. We thus are able to adjust either one of the rack-bars into mesh with the worm-wheel, or both racks out of engagement, so as to stop the inward feeding, as will be understood.

The tool-carriage F is provided with guides F′, fitted and sliding on the rails A′. Bearings F^2 F^3 are provided on the opposite ends of the tool-carriage to receive the drill-shafts G G G. These shafts are provided at their rear ends with gears G′, meshed together. It will be seen the adjacent shafts are driven in opposite directions. We key worm-wheels G^2 G^3, both having similar threads, on two of the adjoining shafts in position to be engaged by the rack-bars B′ or B^2. The drill-shafts in advance of the bearings F^3 are provided with spiral threads, so as to feed out the cuttings. We show this spiral in Fig. 3, and on one of the shafts in Fig. 1, and have not thought it necessary to show it on the other shafts.

The engine-frame is mounted and bolted on the tool-carriage. This frame is provided with cylinders H H, which may be supplied with steam in any desired manner. The power-shaft H′ is journaled on the engine-frame, and provided on its ends with cranks connected by pitman H^2 with the pistons operating within cylinders H. We also provide this shaft with suitable eccentrics, as clearly shown. A bevel-gear, H^3, is secured on the power-shaft, and meshed with gear I′, secured on shaft I. A gear, I^2, is also secured on shaft I, and is meshed with a gear, J′, journaled in the end of lever J, which is bent into the L shape shown, forming the arms *j j′*, and pivoted at the juncture of the arms, giving great power and enabling the easy operation of the parts, as will be understood. This lever is bent at J^2 at almost a right angle, and is journaled at such point in the shaft I. The gear J′ is meshed, when in the position shown in Fig. 2, with a suitable gear keyed on one of the drill-shafts, so as to drive same, and thereby all

the shafts, by means of the gears before described. A segment-rack, K, is mounted on the engine-frame in position to be engaged by the lever J, which, at the point of engagement, is constructed substantially like the lever C, before described, except that the spring is socketed in the handle instead of bearing between same and the shoulder of the lever. It is manifest that either form of pawl device could be used with one or both the levers, as desired by the operator. This lever J may be turned on the shaft I as a pivot, so as to throw gear J′ into mesh with and drive the drill-shafts, or up out of engagement with same to stop the machine, as will be understood on reference to the drawings. The drill-shafts extend for a considerable distance in advance of the carriage, and have their forward ends arranged, as shown, with the alternate ones, one slightly in advance of the others, so that the cutter-heads K will not interfere with each other in their revolutions.

In order to prevent the forward end of these shafts from spreading apart, and to secure a steady, uniform action, we have found it desirable to connect them by means of frame L, provided with individual bearings L′, and composed of two plates, the upper and lower ones, L^2 L^3, bolted or otherwise secured so that they may be taken apart for the purpose of repairing or renewing one or more of the shafts in case of breakage or other damage to same, as will be understood.

It is obvious that instead of making the brace in two sections, as shown, it might be made with the upper or lower bar in one piece and the other one in as many sections as there are shafts; but we prefer the construction as shown and before described.

The operation of our machine is simple, and will be readily understood from the description before given.

The engine-frame being bolted to the tool-carriage gives the same a great strength and rigidity, and prevents its warping or being twisted or damaged by great strain incident to the operation of the machine.

In Fig. 5 we have shown a worm-wheel provided with two series of grooves, forming both right and left hand teeth, and which may be substituted for the two worms before described. In this case slight modifications in the form or arrangement of the rack-frame will be necessary in order to permit either of the rack-bars to be brought in engagement with this single worm. This would also require that the rack-bars B′ B^2 should have one right and the other left hand threads.

As shown in Fig. 1, we construct the rack-frame so the worms will run off the toothed bars at each end, and the machine will stop of itself, thereby preventing damage to same from inattention of attendants. It will be seen that the two worms shown in Fig. 1 are revolved in opposite direction, so that one or the other, according to the adjustment, will move the carriage back and forth. In case it is desired to use one right or one left hand thread worms, they should be secured on alternate shafts, so they will be revolved in the same direction, and the rack-bars should be made with threads corresponding to the worm which they engage, as will be readily understood. We prefer, however, the construction shown in Fig. 1, and before described.

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

1. The combination of a series of drill-shafts, a worm wheel or wheels secured on said shafts, a pivoted rack-frame adjustable on its pivot, whereby its opposite toothed bars may be brought into engagement with said worms, and the necessary operating mechanism, substantially as set forth.

2. The combination, with the series of drill-shafts, of worm-wheels secured on two of said shafts, the rack-frame pivoted and having its rack-bars provided with teeth adapted to engage said worm-wheels, operating mechanism, and means whereby the rack may be adjusted and held in engagement with either of said worm-wheels, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ANDREW J. BAGGS.
JAMES T. BAGGS.

Witnesses:
GEO. B. PASCO,
HILL. THORNBERRY.