4 Sheets, Sheet 1.

G. E. Donisthorpe,

Mining Coal.

No. 82,390. Patented Sep. 22, 1868.

FIG. 2.

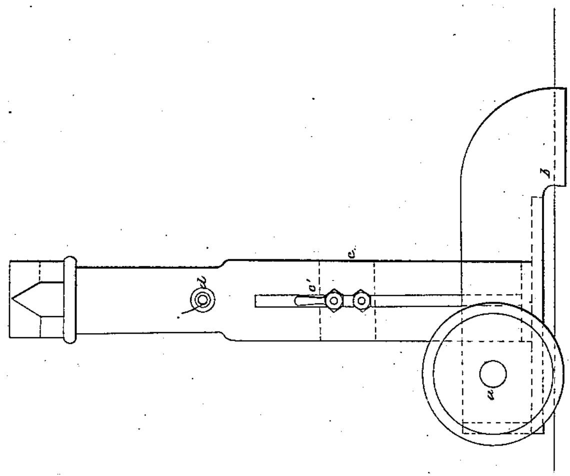
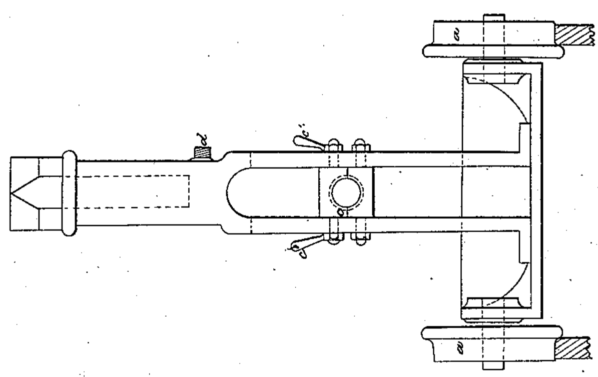


FIG. 1.



Witnesses;
W H Cowley
Thos Tresdale Jr

Inventor;
G E Donisthorpe

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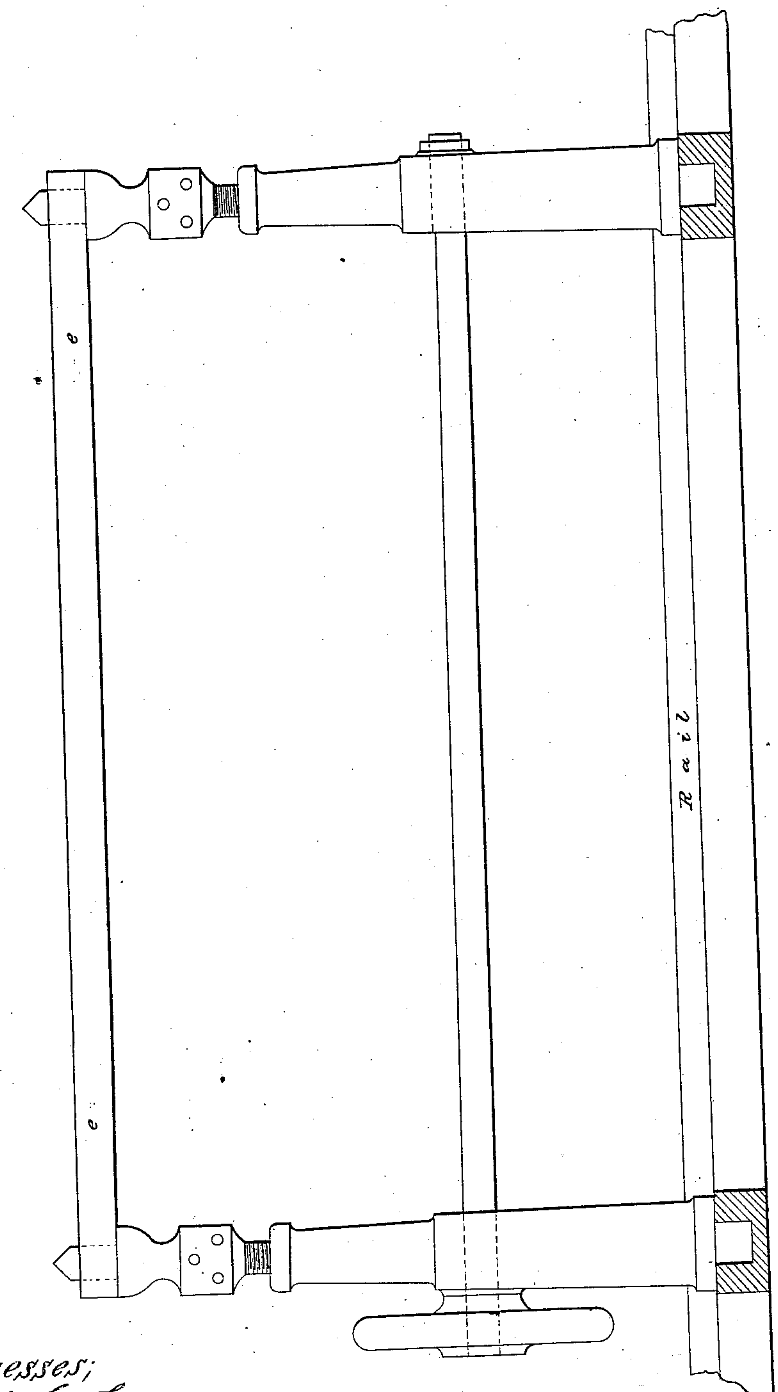

Witnesses;

Inventor;

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

4 Sheets, Sheet 3.

G. E. Donisthorpe,

Mining Coal.

No 82,390.

Patented Sep. 22, 1868.

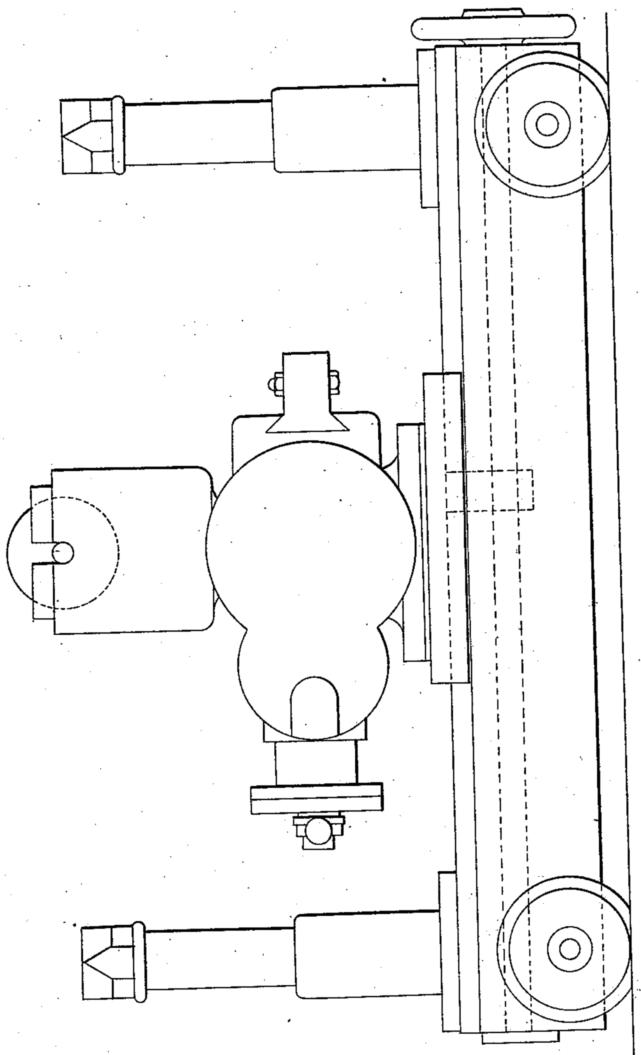

Fig: 4.

Witnesses;

W H Cowley

Thos Grisdale Jr

Inventor;

G E Donisthorpe

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4 Sheets, Sheet 4.

G. E. Donisthorpe,

Mining Coal.

No. 82,390. Patented Sep. 22, 1868.

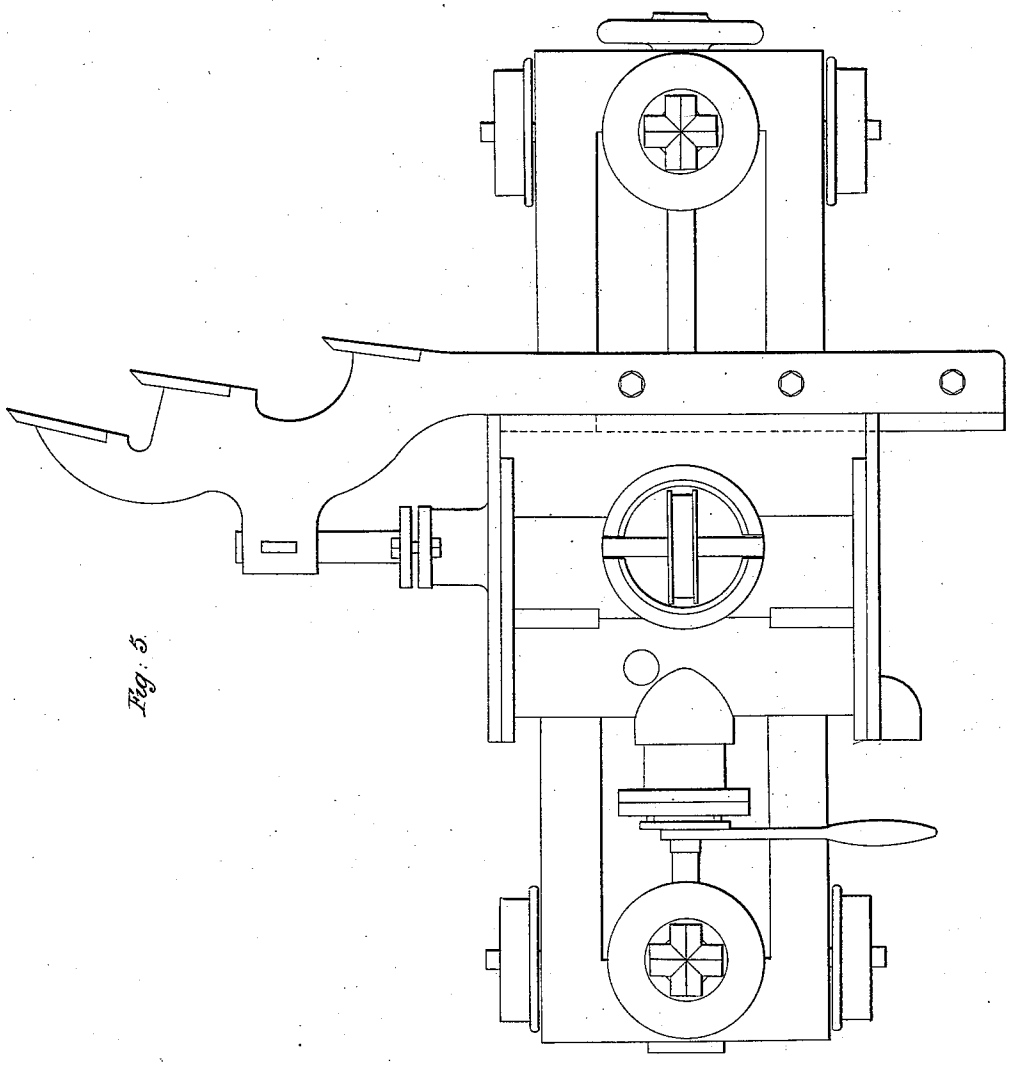

Fig. 5.

Witnesses;
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Thos Grisdale Jr

Inventor;
Wm Thorpe

United States Patent Office.

GEORGE EDMUND DONISTHORPE, OF LEEDS, ENGLAND.

Letters Patent No. 82,390, *dated September* 22, 1868; *patented in England, December* 5, 1865.

IMPROVED COAL-MINING MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL TO WHOM IT MAY CONCERN:

Be it known that I, GEORGE EDMUND DONISTHORPE, of Leeds, in the county of York, England, top and nail-manufacturer, a subject of the Queen of Great Britain, have invented or discovered new and useful "Improvements in Machinery Employed when Getting Coal and other Minerals;" and I, the said GEORGE EDMUND DONISTHORPE, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof; that is to say—

This invention has for its object improvements in machinery employed when getting coal and other minerals.

Heretofore it has been proposed to employ machines carrying reciprocating cutters for cutting grooves into coal and other minerals, the machines being, for this purpose, caused to move forward progressively on a rail or tram-way.

My invention relates chiefly to an arrangement of apparatus for progressively moving forward such machines along the rail or tram-ways upon which they are supported. For this purpose, I employ a screw, working into a nut. Either the screw or the nut may be carried by the machine. When the screw is carried by the machine, I form the screw so as to project out beyond its forward end, and cause it to work into a nut supported by a pillar in front of the machine. This pillar is made capable of extension, so that it may be caused to wedge between the floor and the roof of the mine, and be thus fixed in position, and the lower end of the pillar is formed to run on the rails that support the cutting-machine.

The screw carried by the machine may be caused to turn by any suitable means. When the machine has been drawn forward by the screw, so as to come up to the pillar carrying the nut, the pressure, that previously held fast the pillar, is released, and the pillar is wheeled forward a distance, and again set fast. The machine can then again be drawn forward up to the pillar by turning the screw.

When the nut is carried by the machine, I, by preference, carry the screw between two such pillars, one in front and the other at the back of the machine, and the pillars I connect together, near their upper ends, by a bar. Each pillar, at its lower end, is formed to run on the rails that support the cutting-machine, and each pillar, or the bar that connects them together, is provided with apparatus for pressing against the roof of the mine, so that the pillars may be set fast. In this arrangement the machine is drawn forward by causing the nut to revolve, and the pillars are moved forwards a distance at intervals, when required.

I also employ similar pillars, placed in front and at the back of the machine, to steady the machine when at work, and prevent it from getting off its rails. The pillars are, for this purpose, made capable of being wedged or fixed between the floor and roof of the mine, and are, by preference, connected together by a bar, so placed that some part of the machine shall come against it if the machine should rise off its rails. For example, pillars, such as above described, and placed in front and at the back of the cutting-machine, may, at their upper ends, be arranged to support a rail for a pulley, pressed upwards from the machine, to run on.

In order that my invention may be fully understood, and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

Description of the Drawings.

Figure 1 shows an end view, and

Figure 2 a side view of a pillar, such as above first described, the pillar being arranged to carry a nut for a screw carried by the machine to work in.

The pillar, at its lower end, is provided with a pair of wheels, *a a*, to run on the rails used for supporting the machine, which is to cut the grooves in or above or below the coal. The pillar, at its lower end, is also formed, at *b b*, to slide upon and embrace the rails, as shown. The nut *c*, into which the screw carried by the machine is to work, is capable of being set at any desired height on the pillar by screws and nuts, as is shown.

At the top of the pillar is a cylinder, which receives a plunger that forms the top of the pillar. Into the

lower part of this cylinder compressed air can be admitted through the inlet *d*, in order to press the plunger upwards, and so wedge the pillar between the floor and roof of the mine.

When employing a pillar, such as is above described, the pillar is placed at such a distance from the machine employed for cutting the grooves as the length of the screw carried by the machine will admit of. The pillar is then fixed in its place by admitting compressed air into its air-cylinder, so pressing upwards the plunger and wedging the pillar between the floor and roof of the mine.

The cutter or cutters carried by the machine are then set to work, and the machine is drawn by the screw carried by it, being rotated at intervals. When the machine has drawn itself forward up to the pillar, the upper half of the nut *c* is released by turning the handle *c'*, and is raised away from the screw. The screw is then, by hand, raised out of the lower half of the nut, and the pillar is moved forward a distance, and again set fast. The nut *c* is then again caused to engage with the thread of the screw, and the machine again set to work.

In place of the pillar that carries the nut being made capable of extension by an air-cylinder and plunger, as described, other modes of extending the cylinder may be resorted to.

In the arrangement shown at Figure 3, the nut is on the machine and the screw carried by two pillars, one in front and the other at the back of the machine. These pillars may, if desired, be arranged at their lower ends to run on the rails, as above described, but I prefer to arrange them in the manner shown in the drawing. The lower ends of the pillars, as there shown, are formed to drop into holes formed in the sleepers, to which the rails are fixed.

The upper ends of the pillars are each made capable of being extended by a screw, as shown, and the upper end of each screw is formed into a head. These heads support between them a bar, *e*, which they press upwards against the roof of the mine. The under side of this bar will then form a rail, for a roller to run on, that is pressed upwards from the cutting-machine.

In the arrangement shown in the drawing, the screw has a hand-wheel upon it, by which it can be turned by hand to draw the machine forward when at work. When the machine has thus been drawn forward to the foremost pillar, the pillars are released, and are carried forward and inserted into the holes of other sleepers, and again set fast.

In place of the cutting-machine being steadied when at work by a pulley, pressed upwards from it, being caused to bear against the bar *e*, a bar, supported between two pillars, one in front and the other at the back of the machine, may be otherwise arranged to steady the machine when at work, and prevent it from getting off the rails.

Another arrangement of employing a screw and nut for drawing the machine forward when at work is shown at Figures 4 and 5. In this arrangement, the portion of the machine that carries the cutting-tool or tools is arranged to slide on a bed that runs on the rails. The bed carries a screw that works into a nut on the sliding portion of the machine; and at one end of the screw is a hand-wheel, by which the screw can be turned.

At each end of the bed is a pillar, which can be extended (as in the arrangement shown at figs. 1 and 2) to fix the bed in its place. When the machine is at work, the bed is held in its place by the pillars at its two ends, and the sliding portion, which carries the cutters, is drawn forwards by turning the screw by its hand-wheel.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim, is—

1. The combination of the mining-machine with a screw and nut to move it forward, and with a removable pillar to sustain the thrust of the screw, substantially as before set forth.

2. The combination of the mining-machine with a steadying-bar, sustained by removable pillars, connected and supported as described, to steady the machine when at work, and prevent it from getting off the rails, substantially as before set forth.

G. E. DONISTHORPE.

Witnesses:
W. H. COWLEY,
THOS. GRISDALE, Jr., } *both of Leeds, England.*