No. 809,790. PATENTED JAN. 9, 1906.

F. ECKERSLEY.

FEED FOR COAL CUTTING MACHINES.

APPLICATION FILED FEB. 27, 1905.

3 SHEETS—SHEET 1.

FIG. I.

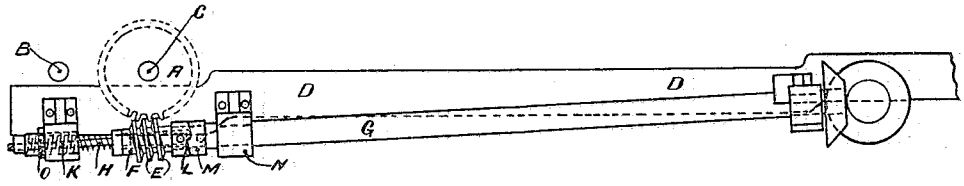
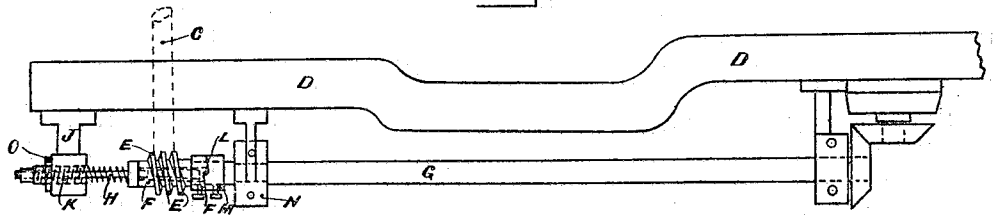


FIG. II.



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3 SHEETS—SHEET 2.

FIG. III.

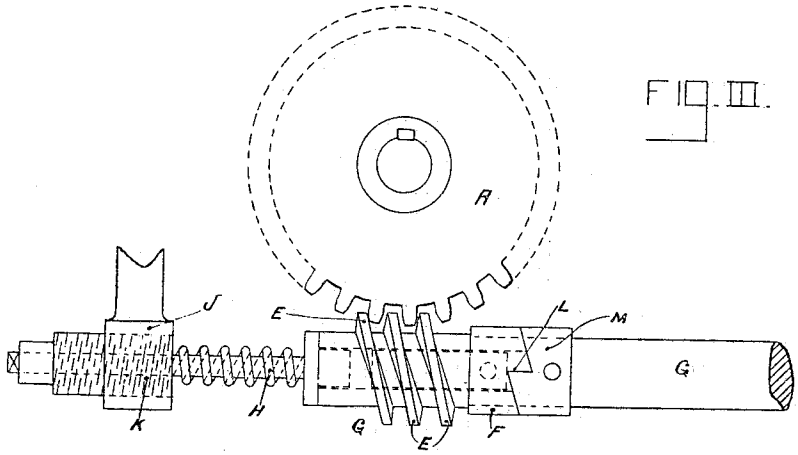


FIG. IV.

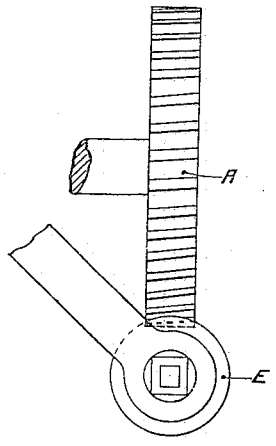
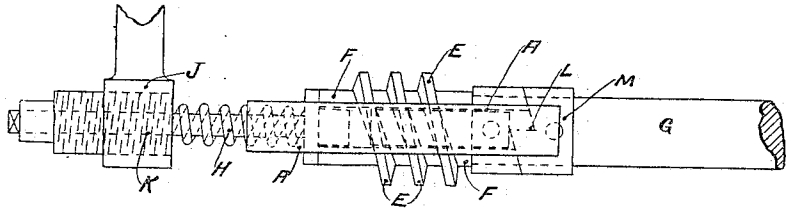


FIG. V.



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FEED FOR COAL CUTTING MACHINES.

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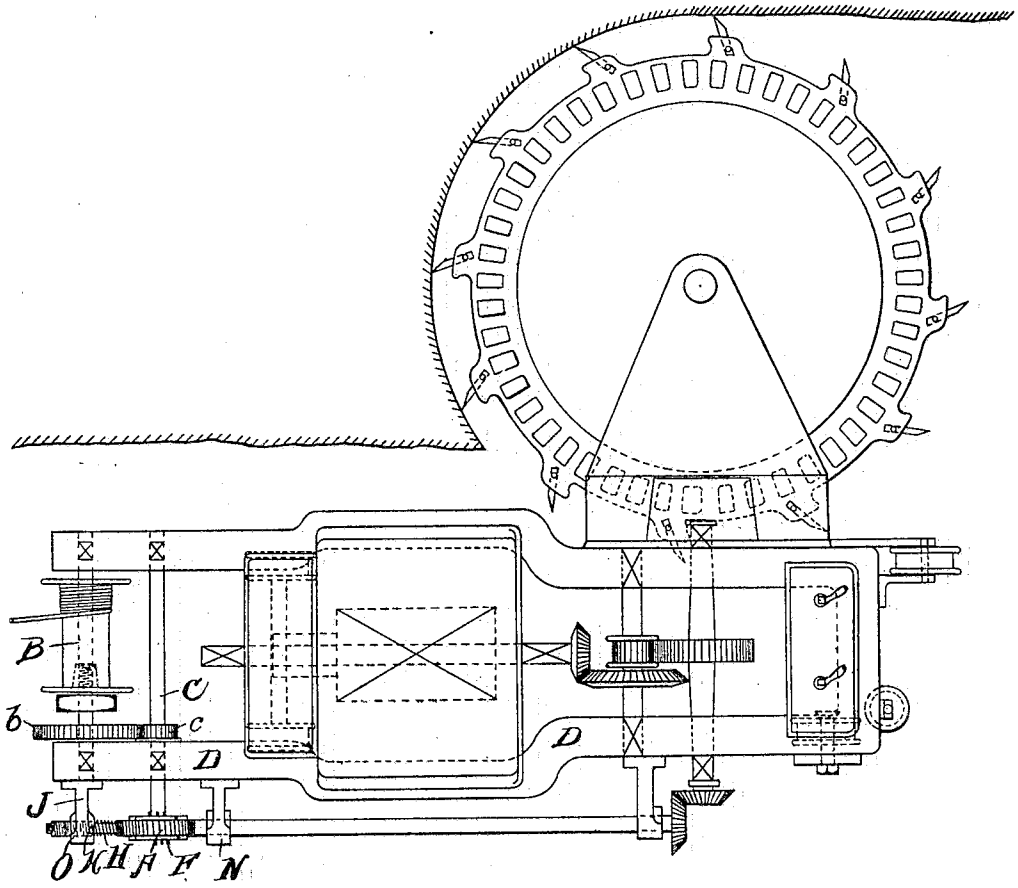
3 SHEETS—SHEET 3.

Fig. 6.



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UNITED STATES PATENT OFFICE.

FRANK ECKERSLEY, OF CROFTON, NEAR WAKEFIELD, ENGLAND.

FEED FOR COAL-CUTTING MACHINES.

No. 809,790. Specification of Letters Patent. Patented Jan. 9, 1906.

Application filed February 27, 1905. Serial No. 247,606.

To all whom it may concern:

Be it known that I, FRANK ECKERSLEY, a British subject, residing at Queen's Villas, Crofton, York county, England, mining engineer, have invented certain new and useful Improvements in or Connected with the Feed for Coal-Cutting Machines and the Like; 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.

This invention relates to machinery for coal-cutting and similar purposes, and has particular reference to the "feed" of such machinery. Heretofore the feed of machines of this nature, although automatic, is not self-controlling or self-regulating, the regulation of the amount or quantity of feed or distance through which the machine moves, and when the machine is overloaded to throw the feed out of action, having to be done by hand, so rendering the machine liable to injury, and in this and other respects very unsatisfactory.

The object of this invention is to provide machinery for the purposes aforesaid which besides having an automatic feed shall have the same self-regulating or self-controlling, which is effected by simple and efficacious means and so that the disadvantages premised are obviated.

In order that my said invention may be more readily understood, I will now proceed to describe the same in reference to the accompanying drawings, in which—

Figure 1 is a side elevation, and Fig. 2 a plan, of side of coal-cutting machine, showing my invention applied thereto. Figs. 3, 4, and 5 are detail views, Fig. 3 being a side elevation, Fig. 4 an end elevation, and Fig. 5 a plan, all of detached parts. Fig. 6 is a top plan view of a complete mining-machine, showing my invention applied thereto.

To the end in view a convenient way is to employ a worm-wheel A, which may be either keyed on the shaft B, which carries the haulage-drum, on which the haulage-rope that pulls the machine forward is wound, or arranged by suitable reduction-gear to drive the said haulage-drum. In the drawings I have preferably shown the latter arrangement; but I would have it understood that the former may be used where it is desired. The worm-wheel A when reduction-gear is used is carried on a shaft C, which is disposed parallel on the machine-frame D with the haulage-drum shaft B. This shaft C also carries a pinion *c*, which gears with a spur-wheel *b* upon the shaft B, the gearing being such as to obtain the required speed of the parts—as, for instance, and in ordinary circumstances, the pinion upon the shaft C may be four inches in diameter and have ten teeth at one and one-fourth inch pitch, and the spur-wheel aforesaid may be thirteen inches in diameter and have thirty-four teeth at one and one-fourth inch pitch. Both these wheels are arranged within the machine-frame D.

The worm-wheel A is arranged outside the machine-frame D upon the shaft C and is driven by a worm E, carried on or forming part of a sleeve F, which is loose on its shaft G. At one end of the worm or sleeve F is a spiral or other suitable spring H or elastic cushion supported by appropriate means, such as a bracket J, bolted to the machine-frame D and capable of being adjusted by a threaded screw K or other suitable device to exert a required pressure on the worm E. At the other or opposite end of the worm E are suitable jaws or projections L, which are adapted to coact with corresponding or appropriate jaws or slots formed in a collar M, which is keyed or otherwise secured to the shaft G, which runs loose within the sleeve F. The shaft G is supported at the worm end by a bracket N, fixed upon the machine-frame D, and is rotated through the intervention of suitable mechanism in gear with the main driving-gear of the machine. When the said shaft G is driven as aforesaid, the collar M is carried with it and also the worm E, which drives the worm-wheel A and hauls forward the machine when the pressure on the spiral or other spring H is sufficient to force the aforesaid worm E or sleeve F with its jaws or projections L into gear with the corresponding jaws or slots on the collar M; but when the tension on the haulage-rope exceeds what is counterbalanced by the pressure on the spring or elastic cushion H this spring or elastic cushion H is compressed, and the worm E or sleeve F disengages with the shaft G by reason of the jaws or projections L withdrawing from those on the aforesaid collar M, and the machine in these circumstances ceases to move forward until the tension on the haulage-rope falls below the pressure exerted by the spring or elastic cushion H. It will be seen that the pressure exerted by the spiral spring or elastic cushion is not equal to the tension on the haulage-rope, as the amount of leverage or reduction in the gearing affects

that. The pressure exerted by the spiral spring or elastic cushion H, multiplied by its purchase or leverage about the center of the shaft B, equals the tension on the haulage-rope multiplied by its leverage about B. Hence it is preferred to use the reduction-gear, as such enables a much lighter spring or elastic cushion to be used than would be possible if the worm-wheel A was centered on the shaft B. The feeding of the machine can therefore only take place under the pressure represented by the pressure on the spring or elastic cushion H, which pressure may be increased or decreased according as the spring or elastic cushion is tightened or slackened by means of the threaded screw K, which is prevented from unscrewing itself by a lock-nut O. It will also be seen from the foregoing description that the feed of the machine is controlled or varied according to the tension on the haulage-rope.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a bodily-movable coal-cutting machine, carrying a motor device thereon, with means for controlling the feed of said machine up to its work, said means including a drum, a hauling-rope passing over said drum, and gearing between said motor and said drum, said gearing including a worm-wheel loosely and slidably mounted on the drum-operating shaft and provided with a clutch member, a corresponding clutch member fastened to said operating-shaft, and a spring normally holding said clutch members in engagement with each other, substantially as described.

2. The combination of a bodily-movable coal-cutting machine, carrying a motor device thereon, with means for controlling the feed of said machine up to its work, said means including a drum, a hauling-rope passing over said drum, and gearing between said motor and said drum, said gearing including a worm-wheel loosely and slidably mounted on the drum-operating shaft and provided with a clutch member, a corresponding clutch member fastened to said operating-shaft, a spring normally holding said clutch members in engagement with each other, and means for adjusting said spring, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK ECKERSLEY.

Witnesses:

WILLIAM NEVINES,

HERBERT DUMAS.