

(No Model.)

3 Sheets—Sheet 1.

L. B. & C. W. ATKINSON & W. T. GOOLDEN.
MACHINERY FOR CUTTING COAL AND OTHER MINERALS.

No. 476,593.

Patented June 7, 1892.

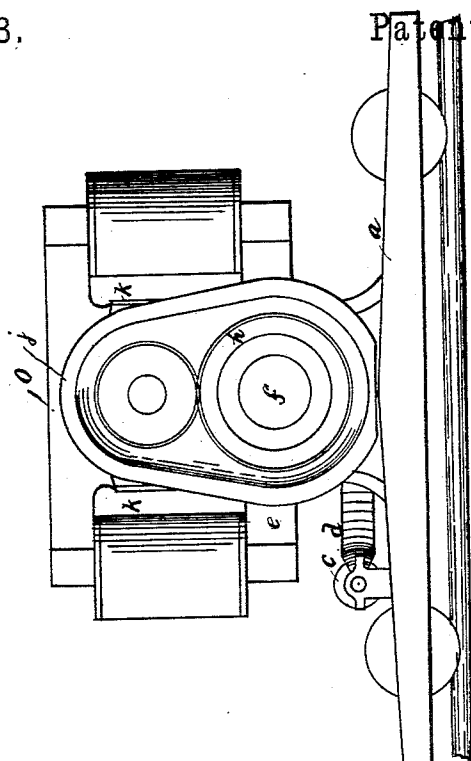


FIG. 2.

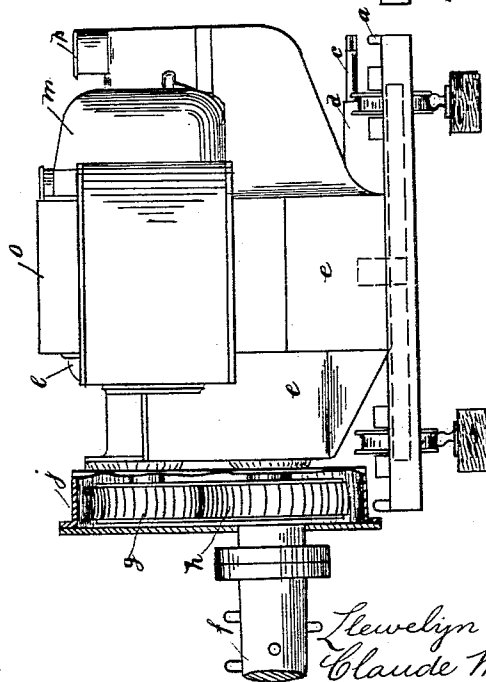


FIG. 1.

Witnesses:

H. Kusterer
Chester E. Fenning

Inventors:

Llewellyn Birchall Atkinson
Claude William Atkinson
Walter Thomas Goolden
By *Richardson*
Attorneys.

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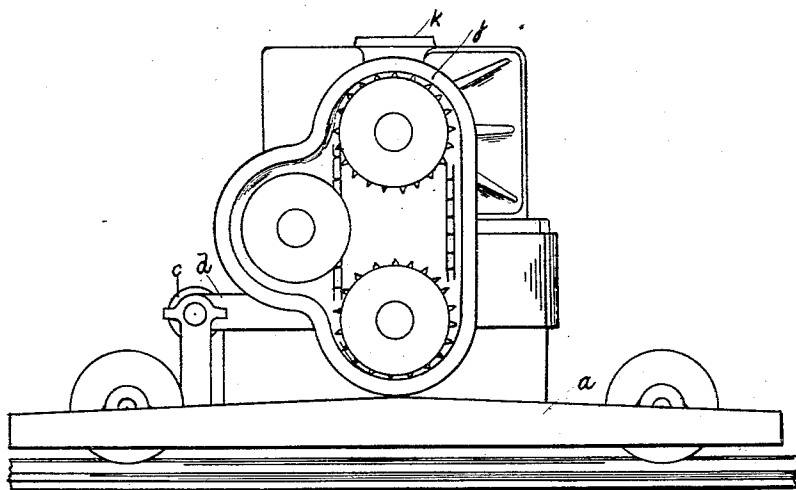


FIG. 3.

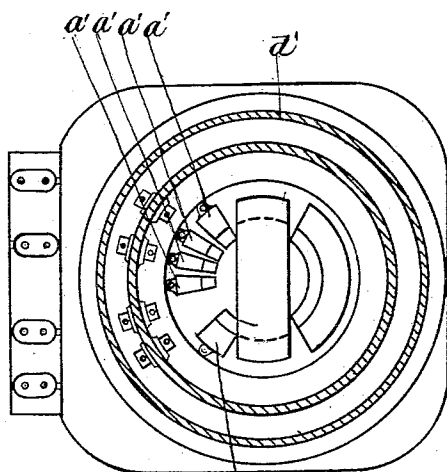
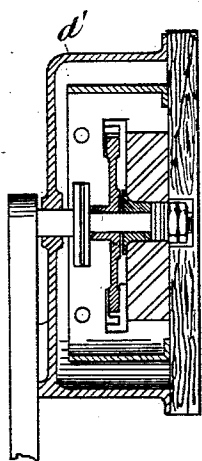


Fig. 4.

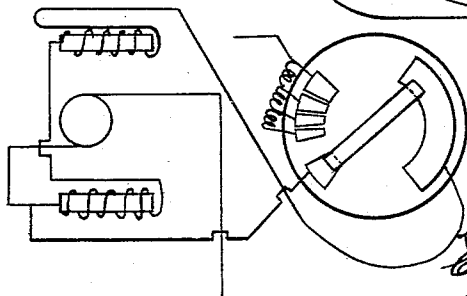


Fig. 5.

Witnesses:

H. Kusterer
Charles E. Kusterer

Inventors:
Lewelyn B. Atkinson
Claude W. Atkinson
Walter T. Goolden.

By *Richard A. [Signature]*
Attorneys.

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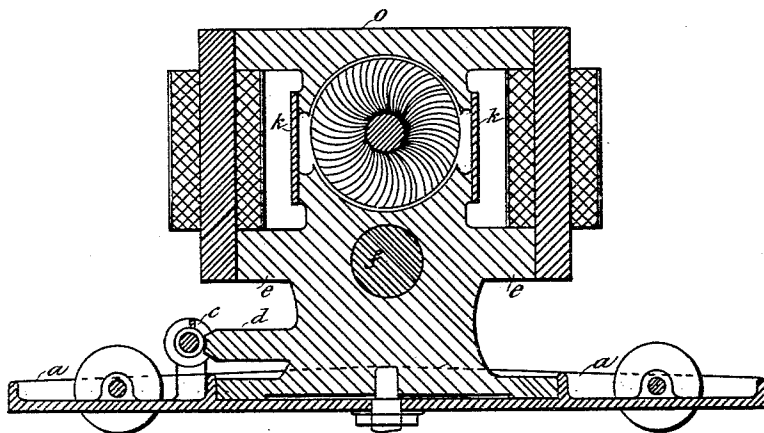


Fig 6

Inventors:

*Llewelyn Birchall Atkinson,
Claude William Atkinson,
Walter Thomas Goolden*

Witnesses

*E. Sawyer,
C. Dallas*

By

Richard L. H.
their Attorneys

UNITED STATES PATENT OFFICE.

LLEWELYN B. ATKINSON, CLAUDE W. ATKINSON, AND WALTER T. GOOLDEN,
OF LONDON, ENGLAND.

MACHINERY FOR CUTTING COAL AND OTHER MINERALS.

SPECIFICATION forming part of Letters Patent No. 476,593, dated June 7, 1892.

Application filed August 18, 1891. Serial No. 403,066. (No model.) Patented in England September 6, 1889, No. 14,041.

To all whom it may concern:

Be it known that we, LLEWELYN BIRCHALL ATKINSON, CLAUDE WILLIAM ATKINSON, and WALTER THOMAS GOOLDEN, residing at London, England, have invented an Improvement in Machines for Cutting Coal and other Minerals, (which has been patented to us in Great Britain under No. 14,041 and dated the 6th of September, 1889,) of which the following is a specification.

This invention has for its object the improvement of machinery for cutting coal or other minerals by electric power by providing a compact combination of electric motor and coal-cutting machine in which the magnetic frame-work of the motor and the framing of the machine are combined.

Figure 1 is an end elevation, and Fig. 2 a side elevation, of our improved machine. Fig. 3 shows modified chain-gear. Fig. 4 embraces a longitudinal section and a plan of the switch. Fig. 5 is a diagrammatical view of the circuits. Fig. 6 is a vertical transverse section on axis of shaft *f*.

The machine is mounted on a base *a*, carried on wheels with double or single flanges to work on the rails of the mine or pit. In the center of this base is a circular cavity having a central pin, on which is secured by guides the circular base of the machine, so that the machine can rotate on the said pin and circular base. The whole machine, consisting of the motor, gearing, and cutter-shaft, can be rotated by means of the worm and worm-segment *c* and *d*.

Figs. 1 and 2 show the arrangement where a horizontal double-field motor is used. By "double-field motor" is meant a motor in which the single field is duplicated or concentrated by double windings, as compared with a single-field motor produced by a single winding only. Here the block *e*, which is in one casting with the circular base, forms the support for the bearings of the shaft which carries the cutter *f*, the shaft passing right through the block, which also forms the bottom pole-piece of the motor. The extensions of this block in front and behind carry the bearings of the armature-shaft, which is parallel to the lower or cutter shaft and gears

with it by means of the wheels *g h*, which are preferably double helical-teeth wheels. The casing *j*, preferably of non-magnetic metal, covers in the wheels to prevent the access of dirt. The armature is inclosed by the side plates *k k* and the front end cover *l* and back covers *m*, which are removable, these covers being attached by bolts, making practically air-tight joints to exclude dirt and to provide against danger from explosive gases. The magnetizing-coils are wound on wrought-iron cores and the top pole-piece *o* completes the frame of the motor. The magnet-coils are inclosed in a sheet steel or copper lagging to protect the wire from mechanical injury.

Fig. 3 shows the modified arrangement where the motor is of the inverted vertical type and shows an arrangement of chain-gear which may be adopted instead of wheel-gearing. The coverings and general arrangement are in this case similar to those already described.

The electric motor is started and stopped by the switch, constructed as follows: On an insulating-base bolted to the machine is mounted a switch, Fig. 4, with four or more consecutive contacts *a' a' a' a'* and one isolated contact *b*. Round the switch proper is an insulated metal cylinder, on which a resistance-wire is wound and connected at intervals to the points of the switch. The whole is inclosed in a metal casing *d'*, practically air and gas tight.

Fig. 5 shows, diagrammatically, the arrangement of the switch and its connections to the motors shown in Figs. 1, 2, and 3, the switch in the latter case being preferably attached to the back of the pole-piece.

The action is as follows: On making the circuit the switch-bar passes over the various points of the switch, and thereby short-circuits the resistance gradually, allowing the machine to start steadily. On moving the switch to stop the motor the resistance is gradually inserted, and, finally, at the moment of breaking, by means of the isolated point of contact *b* the magnet-coils are short-circuited, thus diminishing the spark very considerably.

Having now particularly described and ascertained the nature of our said invention

and in what manner it is to be performed, we declare that what we claim is—

In a machine for cutting coal or other minerals, the combination of a magnetic pole-
5 piece or yoke connecting the like poles of two electro-magnets and adapted to form in one casting a circular base to the motor for swiveling upon a traveling carriage and also adapted for the bearings of the revolving ar-
10 mature-shaft and of an under counter-shaft, geared together by cog-wheels and chain, with

a cutter-bar mounted on the said counter-shaft, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of 15 two subscribing witnesses.

LLEWELYN B. ATKINSON.

CLAUDE W. ATKINSON.

WALTER T. GOOLDEN.

Witnesses:

TOM. M. TULEY,

CHARLES C. F. ARROWSMITH.