

R. MARTIN.
 ELECTRIC MOTOR DRIVEN COAL CUTTER.
 APPLICATION FILED JAN. 27, 1912.

1,145,331.

Patented July 6, 1915.

3 SHEETS—SHEET 1.

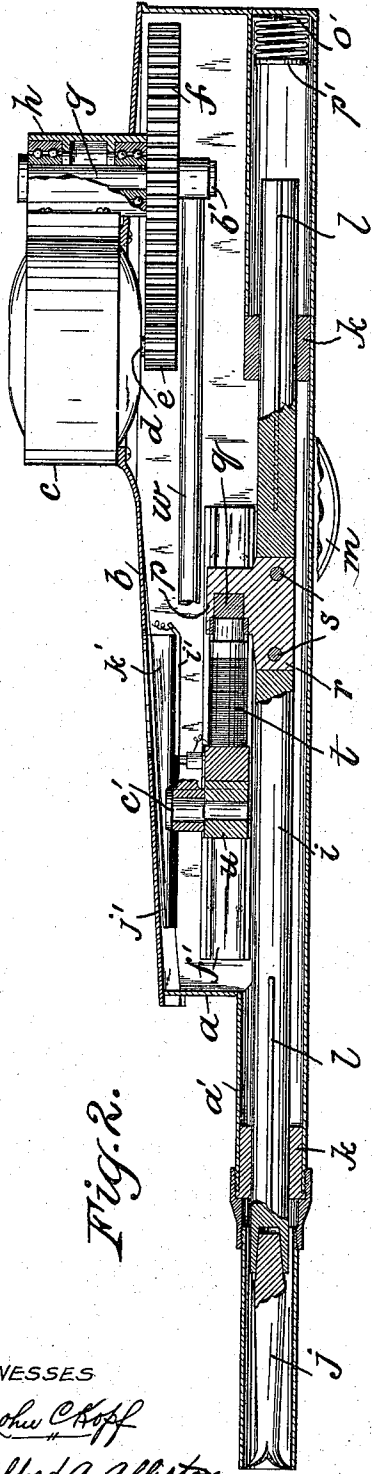


Fig. 2.

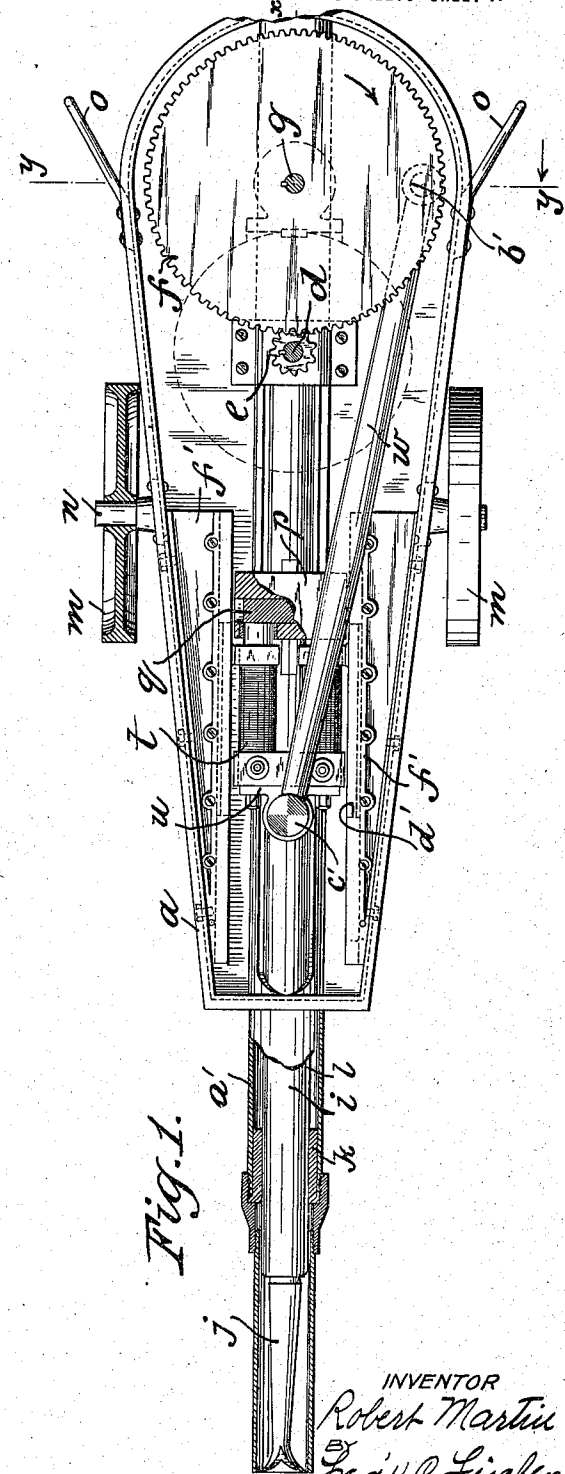


Fig. 1.

WITNESSES
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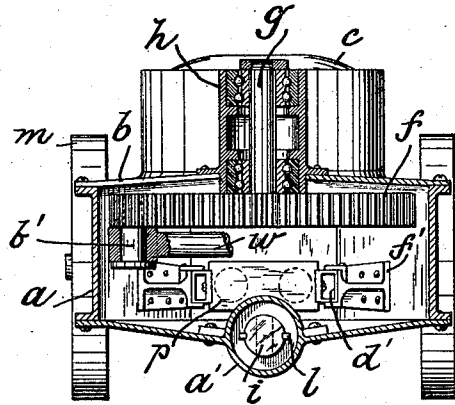


Fig. 4.

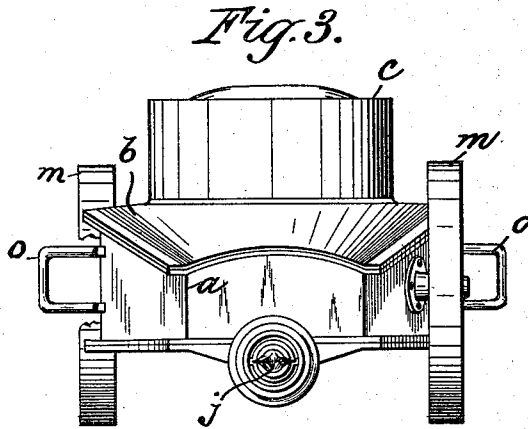


Fig. 3.

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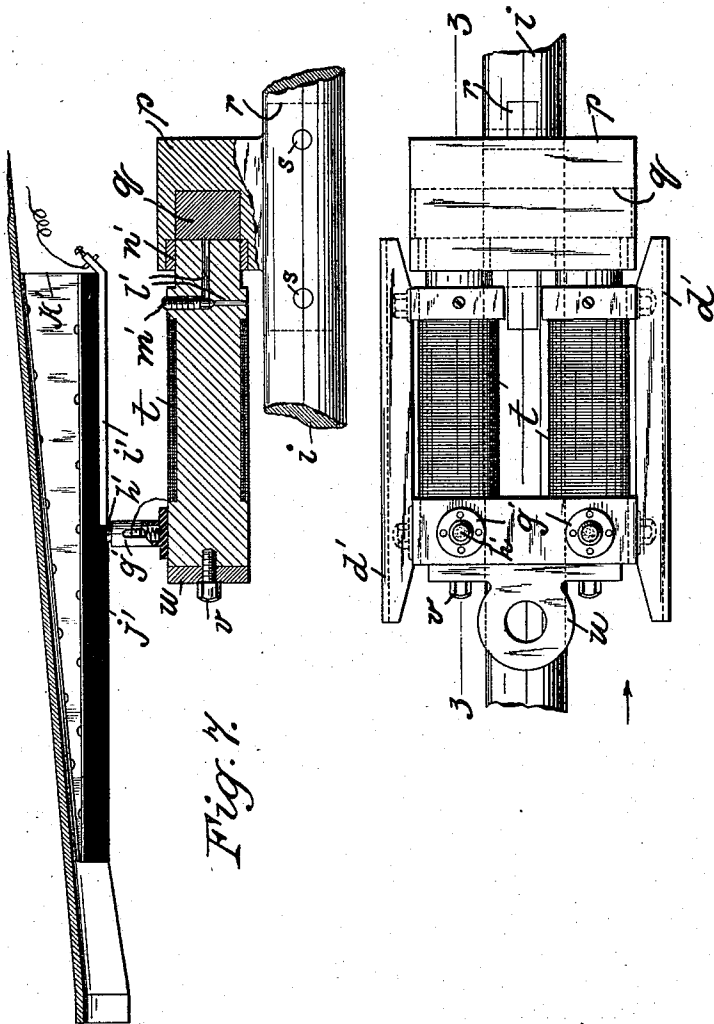


Fig. 4.

Fig. 5.

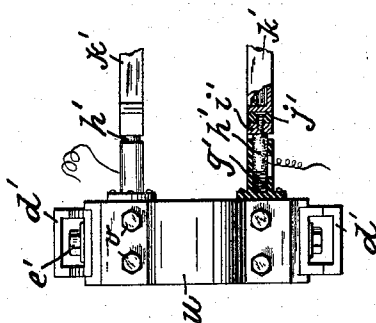


Fig. 6.

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UNITED STATES PATENT OFFICE.

ROBERT MARTIN, OF IRVINGTON, NEW JERSEY.

ELECTRIC-MOTOR-DRIVEN COAL-CUTTER.

1,145,331.

Specification of Letters Patent.

Patented July 6, 1915.

Application filed January 27, 1912. Serial No. 673,927.

To all whom it may concern:

Be it known that I, ROBERT MARTIN, a citizen of the United States, residing in the town of Irvington, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electric-Motor-Driven Coal-Cutters, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it pertains to make, construct, and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, forming a part of this specification.

This invention relates to improvements in mining machinery, and more particularly to an electric motor driven coal cutter.

The object of this invention is to provide certain improvements in the construction, form, arrangement and operation of the machine, whereby the machine will be very effective.

A further object of this invention consists in providing a machine of this character with a pick carrying rod, an armature rigidly secured to said rod, means for reciprocating said rod and armature, an electro-magnet and electro-responsive means for automatically operating said magnet, in order to disconnect the magnet from the armature which is secured to the pick carrying rod to enable the said pick carrying rod to deliver the blow through its own momentum, and at a time when said rod is disconnected from the means which reciprocate the same.

A further object is to provide the armature holder and magnet with suitable air-cushioning means, in order to regulate the cushioning effect when the magnet is about to attract the armature, thereby reducing the liability of the ends of the magnet from striking the armature a severe or sharp blow before the armature is attracted by the magnet.

A preferred construction of the invention is represented in the accompanying drawings, in which—

Figure 1 represents a plan view of the coal cutter, partly in section, with the casing removed and the parts in the position which they assume when the puncher pick is about to strike its work. Fig. 2 represents a longitudinal central section of the same, taken on lines $x-x$ of Fig. 1. Fig. 3 represents a front view of the coal cutter, one of the

wheels being broken away to more clearly illustrate the manner in which the handles are secured to the casing. Fig. 4 represents a cross-section taken on lines $y-y$ of Fig. 1, looking in the direction indicated by the arrow. Fig. 5 represents an enlarged plan view of the electro-magnet and armature, and illustrating the manner in which said armature is secured to the pick rod. Fig. 6 represents a front elevation of the electro-magnet, looking in the direction indicated by the arrow in Fig. 5; and Fig. 7 represents a longitudinal section taken on lines $z-z$ of Fig. 5, illustrating the manner in which the contact plates are carried by the casing.

Similar letters of reference refer to like parts throughout the specification and drawings.

In the drawings, a represents preferably a wrought-iron casing in which are inclosed the various parts and which is provided with a cover b on which is located in any convenient manner, an electric motor c . The shaft d of the motor c has fixed thereto a gear e which drives a gear f fixed to a vertical shaft g which is mounted in a suitable bearing h located on the motor c .

The casing a is further provided with a tubular extension a' projecting from the front of said casing and extending along the entire bottom length thereof. In this tubular extension a' the pick or plunger rod i is located, to the front end of which is attached the pick j . The pick or plunger rod i has longitudinal sliding movement in the casing a and slides in suitable bearings k located in the tubular extension a' , and is prevented from turning, in its longitudinal reciprocatory movements by providing the plunger rod with feathers l operating in grooves formed in the bearings k .

m represents wheels mounted upon trunnions n secured to the casing and o represent handles also secured to the casing near the rear end thereof, by means of which the coal cutter can be held to its work and if desired, be moved from place to place.

p represents an armature holder, preferably made of bronze, carrying a wrought-iron armature q , said armature holder being provided with a depending lug r , which is fitted into a corresponding opening in the plunger rod i and is rigidly secured thereto in any convenient manner, as by means of the pins s .

t represents an electro-magnet of ordinary construction, to the front end of which is secured the supporting bracket *u* by means of bolts *v*.

5 *w* represents a connecting rod, the rear end of which is pivotally connected to the gear *f* by means of the stud *b'* and the front end of which is similarly connected to the bracket *u* by means of the stud *c'*. Secured
10 in any convenient manner to the longitudinal sides of the electro-magnet *t* are the gibs *d'*, preferably by means of the bolts *e'*, said gibs having sliding engagement with the slides *f'* which are secured to the inside of the
15 casing *a*.

g' represent fiber supports which are secured to the electro-magnet *t* in any convenient manner, and in which are located spring-pressed carbon contacts *h'* electrically connected with the electro-magnet, the exposed ends of which have sliding engagement with the copper contacts *i'* which are inserted in the fiber blocks *j'*, said fiber blocks being secured to the supports *k'*, said
25 supports being conveniently secured in any well known manner to the under side of the cover *b*.

In order to provide suitable air-cushioning means between the end of the magnet *t*
30 and the armature holder *p*, thereby reducing the liability of the ends of the magnet from striking the armature a severe or sharp blow, I provide the armature holder *p* with bushings *n'*, so arranged that the inside diameters thereof, together with the face of the
35 armature form dash-pots for the reception of the ends of the magnet, and further provide in the ends of said magnets, air-ducts *l'*, said ducts being provided with adjusting
40 screws *m'*, in order to regulate the cushioning effect when the magnet is about to attract the armature. By means of these ducts, the air from within the bushings is forced out, thereby providing a suitable
45 cushioning effect for the magnet.

o' represents a spiral spring and *p'* a disk conveniently located in any well-known manner in the rear end of the tubular extension *a'*, designed to impart a cushioning
50 effect upon the pick rod should the end thereof strike said disk.

In operation, as the gears *e* and *f* are rotated by the motor, the pick rod or plunger *i* will be reciprocated. Supposing the
55 parts to be in the position shown in Figs. 1 and 2 of the drawings, the magnet *t* contacting with the armature *g* and the carbon contacts *h'* at the end of the contact plates *z'*, with the pick or plunger rod *i* at one half
60 the limit of its outward movement, any further revolution of the gear *f* in the direction indicated by the arrow, will break the

electrical connection between the electro-magnet *t* and the armature *g*, for the reason
65 that any further movement of the connecting rod *w* with its attached magnet, will cause the circuit to be broken at the point where the carbon contacts *h'* become disengaged from the copper contact plates *i'*,
70 as clearly seen in Figs. 2 and 7 of the drawings, and permit the pick carrying rod or plunger *i*, to the front end of which is attached the pick *j*, to deliver the blow by its own momentum.

It is to be understood that when the foregoing operation takes place, the pick is in the position shown in the drawings, namely, in engagement with the coal or in very close proximity thereto, and should it happen that the pick contacts with a very hard material,
80 such as a sulphur ball for instance, the same will deliver its effective blow and rebound, striking the disk *p'*, thereby compressing the spring *o'* which will force the pick carrying rod forward until the armature *g* attached thereto again makes electrical connection with the magnet, when the operation is repeated, thus obviating any possibility of
85 disturbing the operating mechanism of the device.

Experience has demonstrated that the organization above described, is a highly efficient one, and while the device described is the preferred embodiment of my present invention, I do not care to restrict myself to the exact details of construction, combination, and arrangement herein set forth, it being obvious that minor variations thereof not involving the exercise of invention may be made by any skilled mechanic, and such
100 departures from what is herein described and claimed not involving invention, I consider as within the scope and terms of my claim.

I claim:

105 In a machine of the character described, a casing, a pick-carrying rod located within said casing, an armature holder provided with an armature carried by said rod, a connecting rod, an electro-magnet pivotally connected to said connecting rod and engaging said armature, air-cushioning means located in the ends of said magnet and in the armature holder, and a make-and-break connection secured to the casing and to the electro-magnet, whereby said pick-carrying rod is
110 disconnected from the connecting rod.

This specification signed and witnessed this 24th day of January, 1912.

ROBERT MARTIN.

Witnesses:

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CLIFFORD A. ALLISTON.