No. 647,210. Patented Apr. 10, 1900.

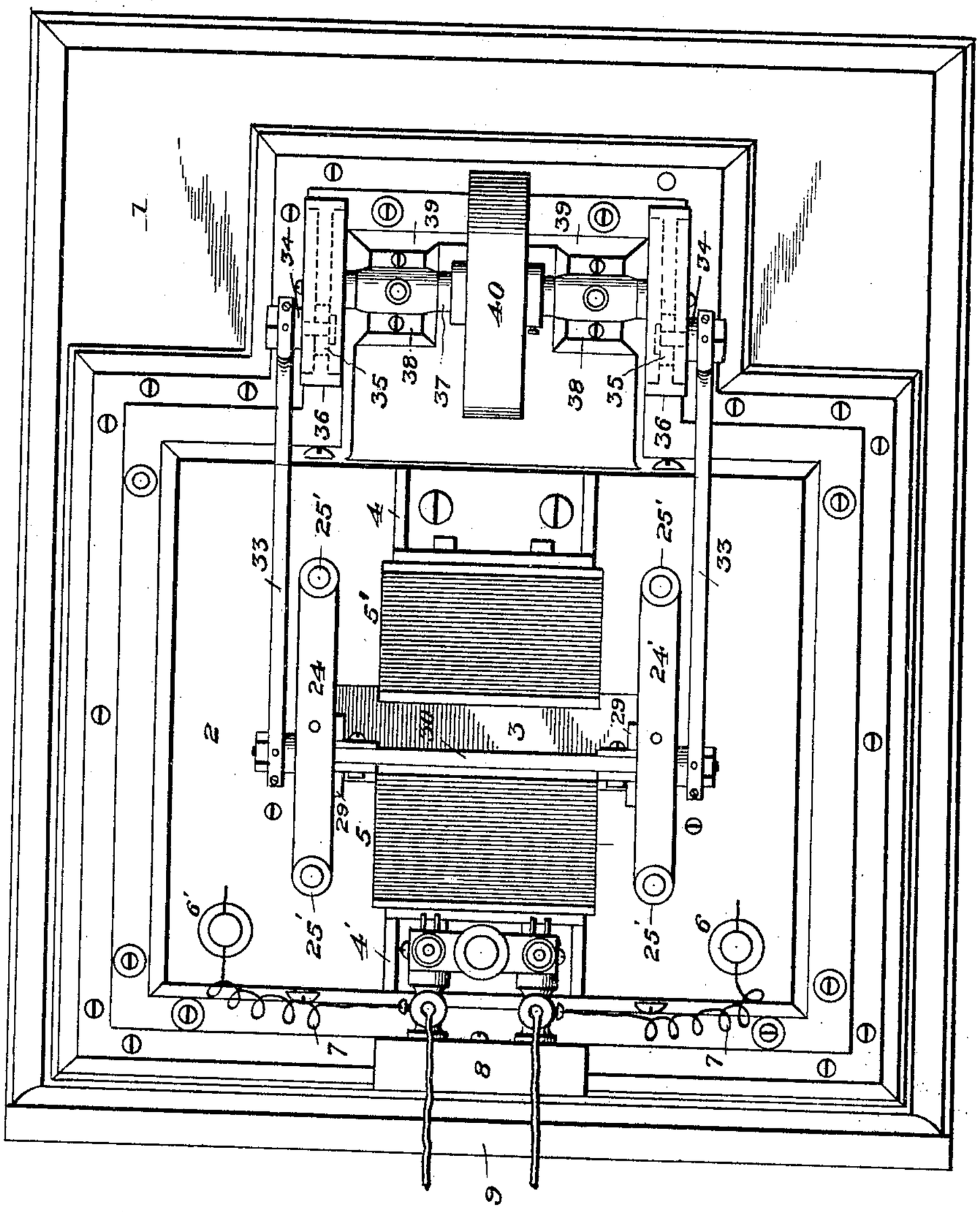
P. B. WATSON.

ELECTROMAGNETIC ENGINE.

(Application filed Mar. 8, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1



Witnesses
W. C. Dodsley
David R. Moore.

Inventor
Peter B. Watson.
By Jno. J. Moore.
Attorney

No. 647,210. Patented Apr. 10, 1900.

P. B. WATSON.

ELECTROMAGNETIC ENGINE.

(No Model.) (Application filed Mar. 8, 1899.)

3 Sheets—Sheet 2.

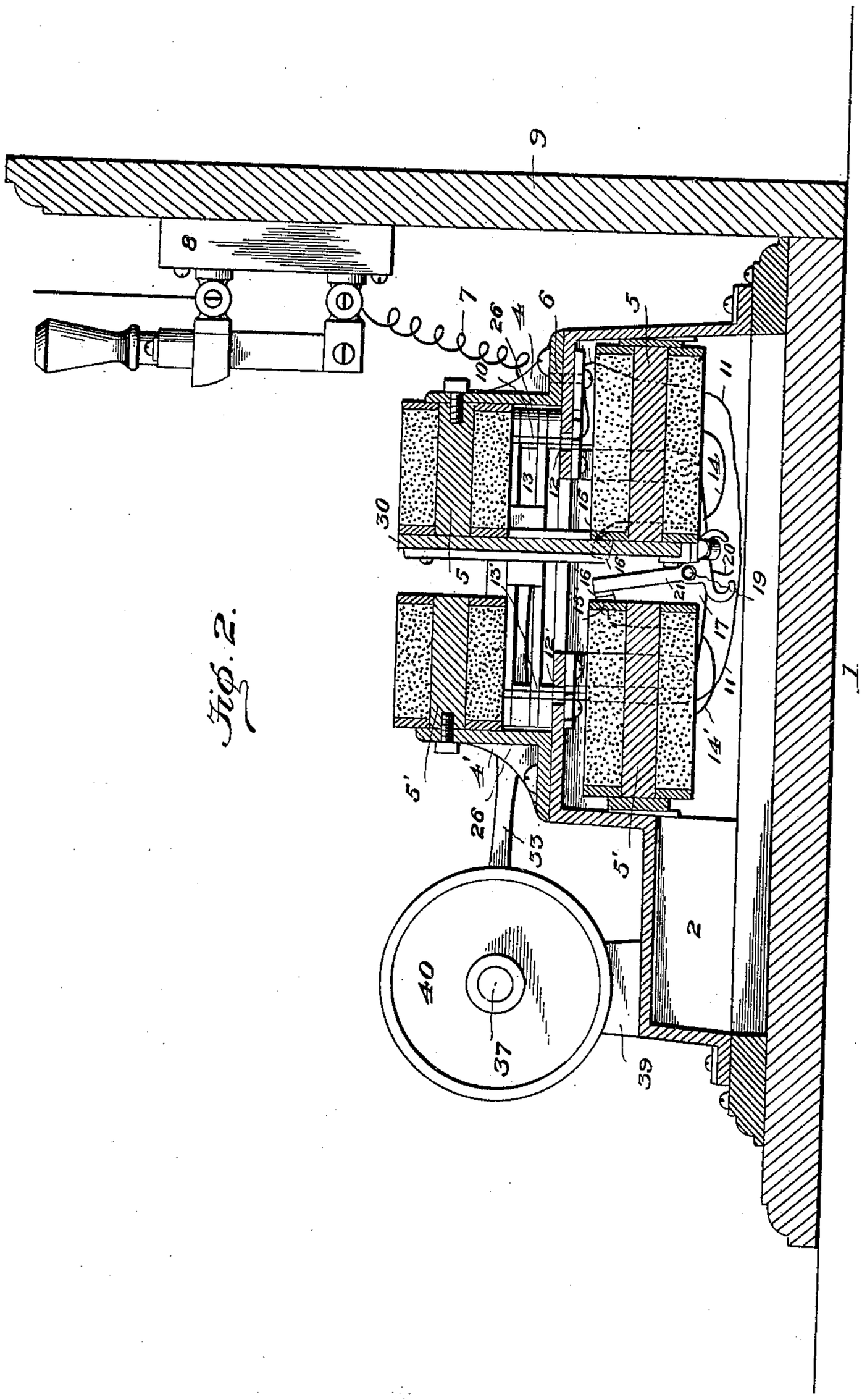


Fig. 2.

Witnesses
"W. C. Dorsheel"
David P. Moore.

Inventor
Peter B. Watson.
BY Wm. P. Moore.
Attorney

No. 647,210. Patented Apr. 10, 1900.

P. B. WATSON.

ELECTROMAGNETIC ENGINE.

(Application filed Mar. 8, 1899.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 5.

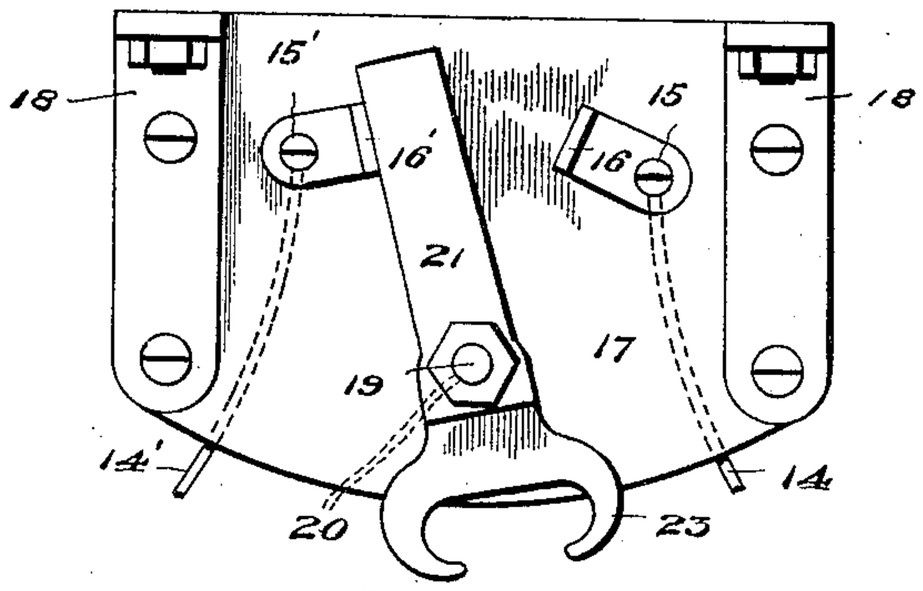


Fig. 6.

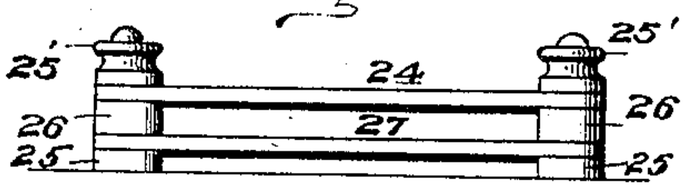


Fig. 4.

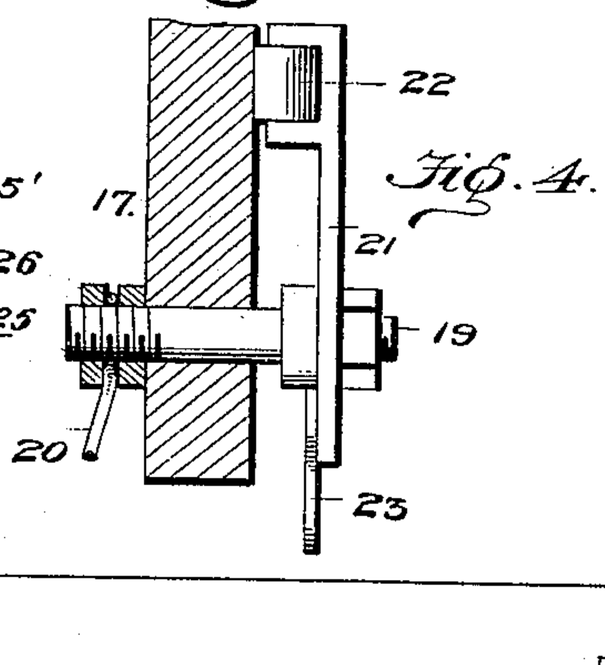
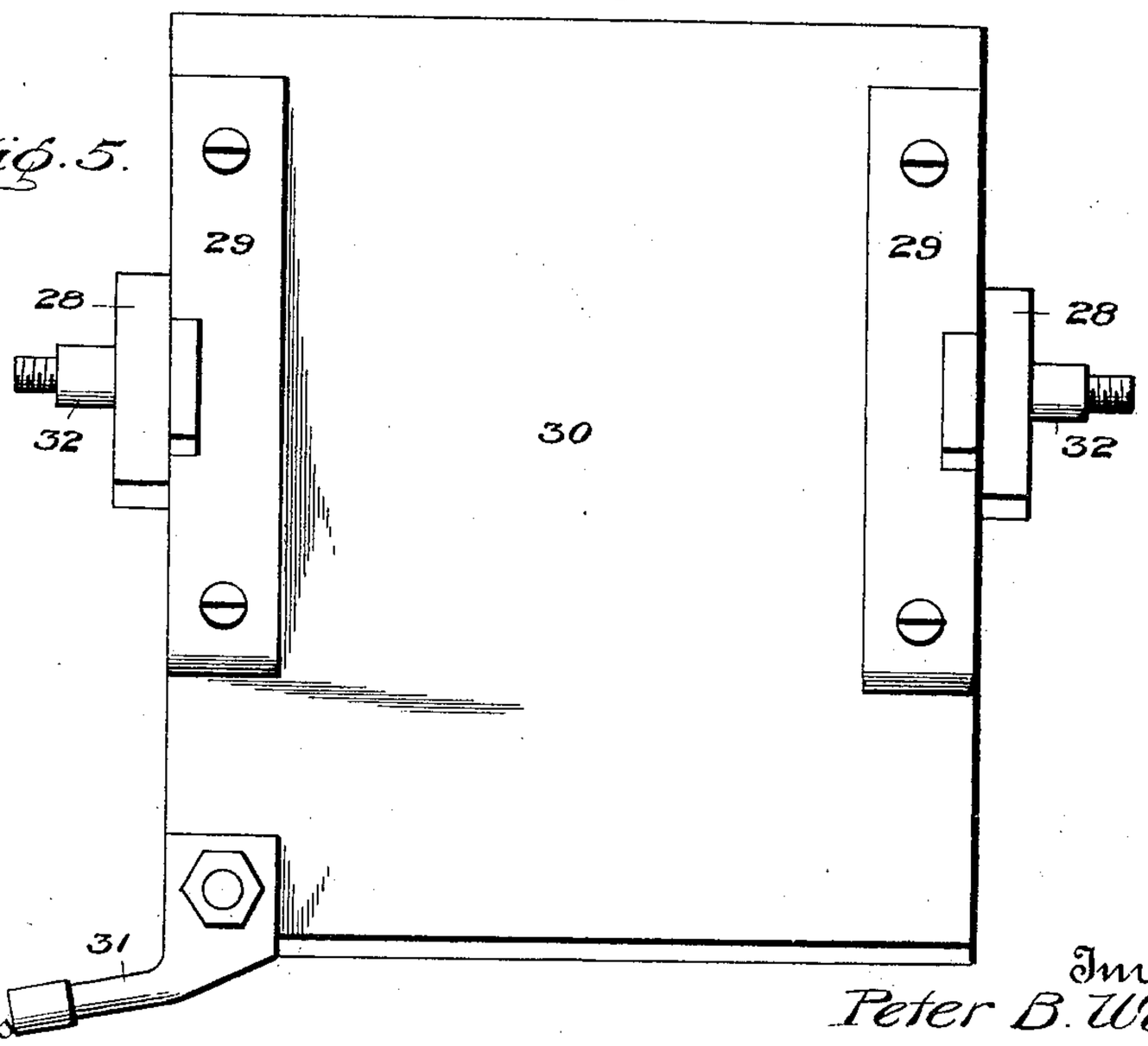


Fig. 5.



Witnesses
"Dashiell"
David P. Moore.

Inventor
Peter B. Watson.
By Wm. P. Moore
Attorney

UNITED STATES PATENT OFFICE.

PETER B. WATSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO GEORGE W. CARVER, OF BOYERTOWN, PENNSYLVANIA.

ELECTROMAGNETIC ENGINE.

SPECIFICATION forming part of Letters Patent No. 647,210, dated April 10, 1900.

Application filed March 8, 1899. Serial No. 708,294. (No model.)

To all whom it may concern:

Be it known that I, PETER B. WATSON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electromagnetic Engines, of which the following is a specification.

My invention relates to improvements in electromagnetic engines; and the leading object of my invention is the provision of an engine of this kind in which the magnets and armature are so arranged that the attraction of the magnets is equalized throughout the entire length of the armature, thus insuring an easy steady movement of the parts.

Another object of my invention is the provision of a very compact, simple, durable, and cheap engine which may be employed to run all kinds of light machinery by employing batteries or weaker currents of electricity, and also by enlarging the parts of the machinery a stronger current may be used to run larger or heavier machinery.

To attain the desired objects, the invention consists of an electromagnetic engine embodying novel features of construction and combination of parts, substantially as disclosed herein.

Figure 1 is a top plan view of my electromagnetic engine. Fig. 2 is a horizontal central sectional view thereof. Fig. 3 is a detail view of my improved switch or cut-off. Fig. 4 is a side elevation of the lever of my cut-off. Fig. 5 is a plan view of the armature. Fig. 6 is a side elevation of one of the runways.

In the drawings the numeral 1 designates a suitable base, upon which is mounted the casing 2, in which and upon which is mounted the mechanism of my electromagnetic engine. Through the top of the large rectangular portion of the casing is the rectangular opening 3, and mounted upon two pairs of brackets 4 and 4′ are the two pairs of coils or magnets 5 and 5′. Upon the rear corners of the casing are mounted the positive and negative posts 6 and 6′, to which are connected the wires 7, leading from the switch-block 8, which in this case is mounted upon the upright board 9, but may be placed in any position, as circumstances may require, this switch being connected with a main current or with batteries, as the case may be. To the under side of the post 6 are connected the wires 10 and 11. The wire 10 passes through the opening 12 in the top of the casing and connects with the upper one of the magnets 5, and a wire 13 is connected to said magnet and passed downward through the same opening and is connected with the lower magnet 5, which has connected therewith by means of the wire 14 the post 15 of the cut-off mechanism, said post having connected therewith the plate or contact 16 on the other side of the base 17. The wire 11 traces a circuit by passing through the opening 12′ in the top of the casing, connecting with the upper one of the magnets 5′, which is connected with the lower magnet 5′ by means of the wire 13′, said lower magnet having connected therewith the wire 14′, which connects with the post 15′ of the cut-off mechanism, said post having connected therewith the plate or contact 16′ on the opposite side of the base 17. This base 17 is mounted in the brackets 18, which secure it to the under side of the casing and allow it to depend therein, and mounted in this base near the top is the pole or post 19, to which is connected the wire 20, having its other end connected with the under side of the negative post 6′.

Mounted swingingly upon the outer end of the pole or post 19 and forming a journal therefor is the swinging arm or pivot 21, in whose upper end is journaled the roller 22, which allows the arm to be easily swung so as to contact the plates 16 and 16′ alternately to switch the current from one pair of magnets to the other, thus cutting off one and charging the other pair. Upon the lower end of this arm are the C-shaped arms or claws 23, the purpose of which will presently appear.

Mounted upon the top of the casing about in line with the outer edges of the opening 3 on both sides thereof and parallel with the upper magnets are the two pairs of strips 24 and 24′, each pair of which is connected to the casing by means of the posts or standards 25, which by means of the removable screw-caps 25′ securely yet removably hold the strips in

place. These strips are held apart by means of the blocks 26, which cause a space or runway 27 to be formed between the strips. In these runways slide the blocks 28, which are connected by means of the upright stays 29 to the sides of the vertically-arranged armature 30, which is depended in the opening 3 and directly opposite the ends of all the magnets, and at the lower corner of this armature is secured the outwardly-extending arm 31, whose outer end fits in the space between the arms upon the end of the arm 21.

Secured upon the outside of the blocks 28 are the trunnions or bearings 32, upon which are movably secured the rods or arms 33, whose other ends are secured to the trunnions 34, adjustably secured in the slots 35 in the wheels 36, secured upon the ends of the axle 37, which is journaled in the bearings 38 upon the top of the standards or posts 39, and secured upon this axle, in the center thereof and fitting in the space between the posts, is the power-transmitting wheel 40.

From the foregoing description, taken in connection with the drawings, the operation of my engine is readily understood and its numerous advantages fully appreciated; but its operation, briefly stated, is as follows:

To start the engine, the armature is first set in motion by turning the power-transmitting wheel, which then sets the direction in which the engine is to run, the current is then turned on by means of the switch, and one pair of magnets are charged, thus drawing the armature in a horizontal direction toward the ends of said magnets, and when the armature has reached its farthest point in one direction the arm 31 contacts one of the claws 23 of the arm 21, causing the roller end of said arm to contact the opposite plate, thus cutting the current from that pair of magnets and charging the other pair of magnets, thus reversing the movement of the armature, and by means of the rods 33 the power-transmitting wheel is kept in motion. Also as the ends of each pair of magnets are in line and as the armature is vertically arranged and its surfaces parallel with the ends of said magnets the attraction of the magnets is equally distributed, and the action is simultaneous, thus insuring a smooth and easy running of the engine.

It is clearly evident that I provide a very compact, simple, durable, and cheap engine whose motion is very smooth and which can be run by either a battery or a dynamo current and which is thoroughly efficient, practical, and useful in every respect; but it will be understood that I do not claim herein, broadly, a magneto-engine having oppositely-disposed electromagnets, with an armature moving in right lines between their proximate poles and cut-off and motion-converting mechanism operated by said armature.

I claim—

1. In an electromagnetic engine, the combination of a base or support, a casing mounted thereon provided with the opening, vertical parallel magnets mounted in and upon said casing upon opposite sides of said opening, guides upon the casing upon opposite sides of the magnets, an armature arranged vertically in said opening between the magnets and slidably mounted in said guides, cut-off mechanism operated by said armature, and a switch.

2. In an electromagnetic engine, the combination of a base, a casing mounted thereon, magnets oppositely arranged and carried by said casing, an armature slidably mounted between said magnets, a cut-off mechanism located in the casing and consisting of a base, posts having electrical connections with the magnets, and a swinging arm or pivot having electrical connection with the outside current, and means to operate said cut-off mechanism carried by said armature to cause the current to be shifted from one set of magnets to the other.

3. In an electromagnetic engine, the combination of a base or support, a casing mounted thereon provided with an opening in the top thereof, electromagnets located upon said casing and in said casing having their inner ends in said line with opposite sides of said opening, guides located upon the top of the casing upon opposite sides of the magnets, a vertically-arranged rectangular armature slidably journaled in said guides and adapted to be moved back and forth by said magnets, an arm carried by said armature, a cut-off mechanism having electrical connection with said magnets located upon one interior side of said casing and adapted to be operated by the arm of said armature as the armature moves back and forth, and means to operate machinery connected to the journals of said armature as it passes between the guides.

4. In a magneto-engine, the combination with a base made in the form of a housing and having a flat top with an aperture therein, oppositely-disposed electromagnets mounted within said base with their proximate poles opposite said opening and slightly-separated and oppositely-disposed electromagnets similarly mounted on the top of said base, of guides arranged in right lines on opposite sides of said electromagnets and supported on the top of said base, an armature supported in said guides to move in right lines and extending through the opening in the base and between the proximate poles in both sets of magnets, a crank-shaft journaled on the base, connecting-rods extending from said crank-shaft and connected with opposite sides of the armature, and intermittingly-operated cut-off mechanism operated by the armature and controlling the currents supplied to the electromagnets; substantially as described.

5. In an electromagnetic engine, the combination with a base, and two sets of oppositely-disposed electromagnets mounted thereon, with a space between their proximate poles, of an armature mounted in said space and

extending between the poles of both sets of magnets, guides for supporting said armature to move in right lines, a crank-shaft connected with said armature, fixed contacts in electrical connection with the electromagnets, a pivoted cut-off also in electrical connection with said magnets, projections on said cut-off and an operating projection on the armature adapted to coöperate with and move the cut-off as the armature reaches the extremes of its movement; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

PETER B. WATSON.

Witnesses:
GEO. W. PIERCE,
CHAS. A. PIERCE.