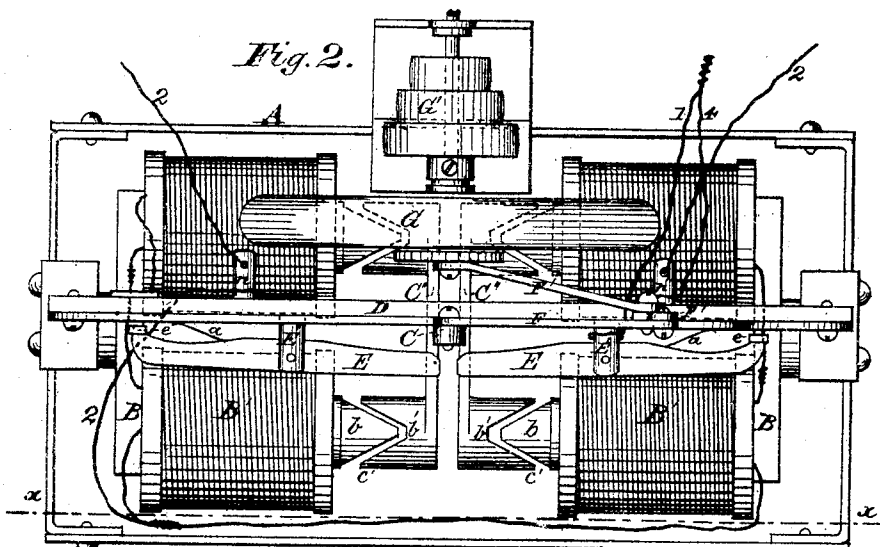
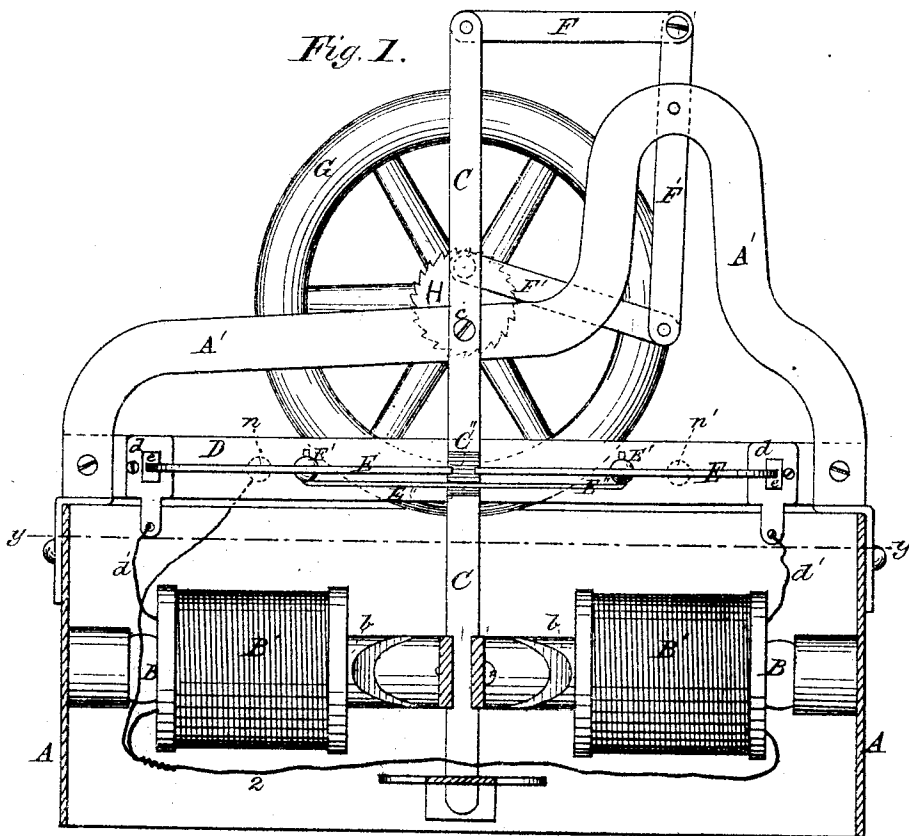


SOLOMON JONES.

Electro-Magnetic Engine.

No. 121,173.

Patented Nov. 21, 1871.



Witnesses:
T. C. Buecht.
Edwin James

Inventor:
Solomon Jones.
per J. E. J. Holmead
Attorney.

SOLOMON JONES.

Sheet II.

Electro-Magnetic Engine.

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Fig. 3.

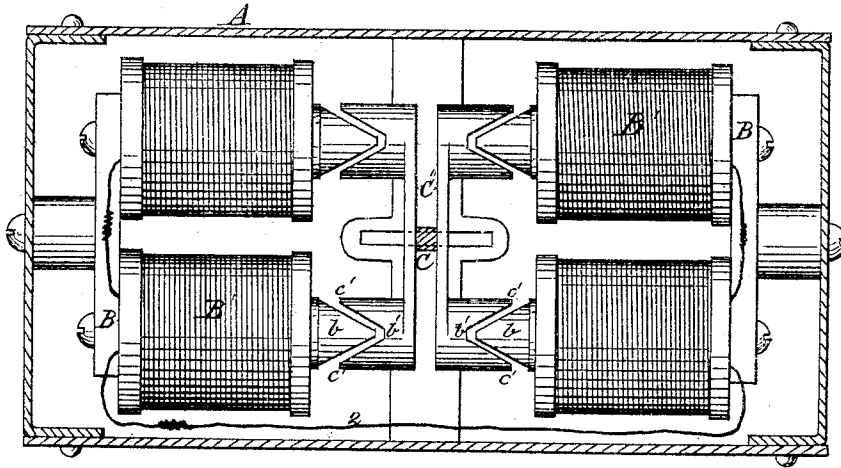
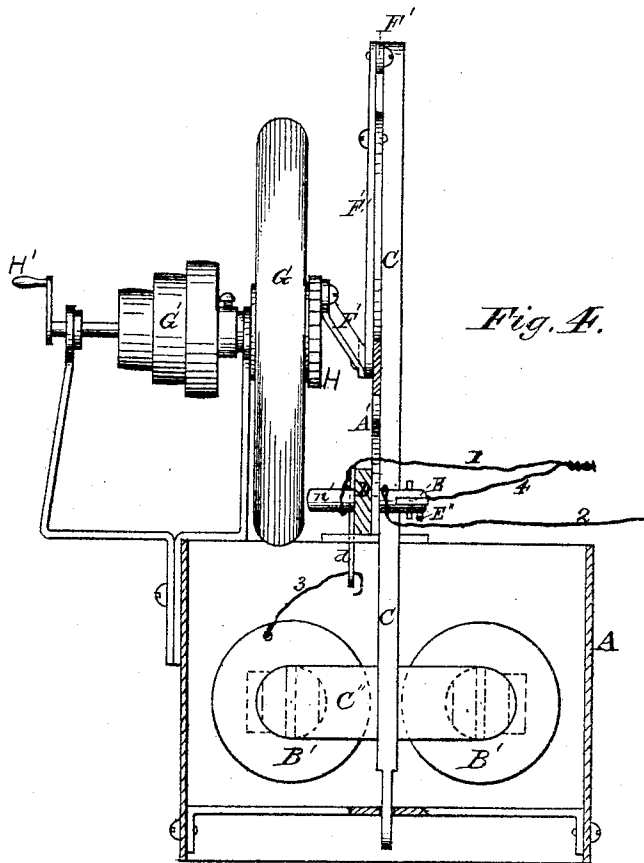


Fig. 4.



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UNITED STATES PATENT OFFICE.

SOLOMON JONES, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN ELECTRO-MAGNETIC ENGINES.

Specification forming part of Letters Patent No. 121,173, dated November 21, 1871.

To all whom it may concern:

Be it known that I, SOLOMON JONES, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Electro-Magnetic Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing and the letters of reference marked thereon making a part of this specification, in which—

Figure 1 is a side view, one side of the case or box being removed. Fig. 2 is a top view. Fig. 3 is a horizontal sectional view. Fig. 4 is a vertical sectional view.

My present improvement consists of an electric engine of the most compact form, and is designed to be so arranged or secured within a box or other suitable case that, with the utmost facility, it may be transported from place to place and attached to any character of machinery it may be required to drive.

The great difficulty with my former improvements (those embraced in and covered by Letters Patent dated January 31, 1871, and August 29, 1871) is that, first, it is impossible to secure with either sufficient motor power; and second, it is impossible to utilize the sliding current-breaker for the purposes designed. The difficulty with the sliding current-breaker is due almost entirely to the fact that in its rapid movement the keys, as they pass over the silver or platina conducting-plates, owing to their intense friction and the electric sparks which the movement engenders, produce so great a heat that in a few hours the conducting-plates are rendered valueless. Practical experience has also demonstrated that even the introduction of water-tubes at the rear of these plates proved unavailing to remedy the difficulty. In my present improvement, however, both of these difficulties are entirely remedied. I not only am enabled to secure any desired degree of power, but, besides, I impart the desired vibratory or oscillating movement to the lever without employing the sliding current-breaker. My present improvement consists, first, in the peculiar form which I give to the armatures. These I make forked or V-shaped, and which, of course, require that the head of the core of the electro-magnet should be angular, so as to readily enter and fit within the recess of the armature. The great advantage, and, indeed, superiority of this form of armature over all others are that the forked arms can be length-

ened at pleasure, and thus increase its direct attractive face, and still always be in direct range with the core of the electro-magnet. Thus it will be readily understood how the attractive faces of the armature may be so enlarged as to receive and utilize the entire power of the electro-magnet. Another advantage of this form over the convex embraced in my former patent is that it is always open to inspection, and, consequently, can readily be so adjusted as to secure an exact range. And again, I so arrange them at the lower section of a vertical lever that their number may be increased or multiplied at pleasure.

My improved current-breaker consists of two short arms pivoted to suitable center-pins, which are secured to the conducting-bar, to which are attached the platina or silver conducting-plates. The short arms that compose the current-breakers are secured at such relative position on the bar that their keys shall be immediately over the plates, but, through the tension of a fine traveling-spring, in their normal condition shall be held free from all contact therewith. These current-breaker bars are, of course, connected with the positive wire of the battery, and, consequently, always charged. These arms are provided with rounded ends, and are so arranged in connection with the vertical lever that, as it vibrates or oscillates, it alternately throws the keys of the one or the other in contact with its respective plate, and thus alternately interrupts and completes the circuit with the opposite set of electro-magnets.

I will now proceed to describe the construction and operation of my invention:

A is the box or case which contains the electro-magnets and other operating mechanism. This may be constructed of any suitable material, and may be of any desired dimensions. In this box or case A are secured the yokes B B, which hold the electro-magnets B' B'. These electro-magnets are arranged in sets, and on opposite sides of the box A. In the drawing only two sets of electro-magnets are shown; but, of course, where an increased power is required, these can readily be multiplied, at pleasure. The head *b* of the cores of these electro-magnets B' B' are angular or wedge-shaped. C is a vertical lever, and is secured on the horizontal arm of the frame A' of the box A. This lever C must be attached by a pivot, *c*, or equivalent axial bearing, so as to allow of its free oscillating or vibratory movement. At the lower section of this lever C, and secured

on its opposite sides, are the two armatures C¹ C¹. These are arranged immediately opposite the electro-magnets B' B', and in such relative position thereto that their forked or V-shaped surfaces b' b' shall not only be directly opposite to the cores b b of the electro-magnets, but also directly on a line therewith. The great advantage of this form of armature is that the prongs c' c' may be made of such length as to afford the greatest amount of attracting surface; and, owing to the fact that the upper faces of these forks are open, the proper adjustment of the armature and core b can easily be made, and which is a great desideratum, and one that cannot be attained with any other form of hollow armature. D is a non-conducting bar, and may be made of any suitable material. This bar is secured to the lower section of the frame A', and immediately above the sides of the box A. On the opposite ends of this bar are two conducting-plates, usually made of either platina or silver. These plates are connected with their respective electro-magnets by wires d' d', as clearly shown in Fig. 1. E E are the two arms which form the current-breaker. These may be made of any suitable conducting material, and are of the form clearly shown in the drawing. At the outer ends of these arms are the keys e e. These arms are pivoted to connecting-posts E¹ E¹ attached to the bar D, and to either of which may be received and secured the positive wire 1 of the battery. These arms E E must be secured, however, at such relative position on the bar D that their keys e e shall be directly opposite the plates d d. The inner ends of these arms are rounded, so that the non-conducting plate C² on the lever C can readily be made to pass under the arm, so as to elevate the same and drive the key against its plate d, as in its normal condition it is held free from contact therewith through a small traveling-spring, a. These arms E E are connected by a wire, E², secured to their under surface, so that they are alike charged by the positive wire 1. On the rear face of the bar is a connecting-post, n, which receives the negative wire 2. This wire 2 is immediately connected with one set of electro-magnets, and also connected, by a short wire, 3, with the other set. Thus the negative connection with each set of electro-magnets and the battery is always complete. On the opposite side of the bar D is another connecting-post, n', to which is attached the wire 4, which, on being brought in contact with the positive wire 1, completes the circuit and renders the machine operative.

In the drawing is illustrated one method of applying my improved electro-magnetic engine hereinbefore described to the driving-gearing of machinery; but other mechanical attachments may be substituted, and the engine will still be equally as effective in operation. Therefore, I desire it distinctly understood that I do not propose to limit myself to the one hereinafter described.

To the upper end of the vertical arm C is pivoted a short horizontal arm, F. The opposite end of this arm F is pivoted to a jointed

bell-crank lever, F', the vertical arm of which has a bearing, which allows of its vibratory movement on the arched or horseshoe-shaped section of the frame A', while its horizontal arm is secured to the eccentric face of the nave of the driving-wheel G. On the axle of the driving-wheel G is secured a cone-shaped pulley, G', and which is adapted to receive belting, &c. The ratchet H is designed to be used only when very heavy machinery is to be driven, and the crank H' when a pitman-connection is desired.

From the foregoing full and detailed description the operation of the electro-magnetic engine will be readily understood.

The battery being in order, the positive and negative connections are completed through the wires 1 2, the positive wire 1 through its connecting-post E¹, and connecting-wire E² charging both of the current-breaker arms E E, and thus placing them in condition to complete the circuit with either set of electro-magnets, they being negatively charged through the wires 2 3. The machine is now ready for operation. Neither key of the current-breakers is in contact with its conducting-plate as the tension of the springs a a is constantly being exerted to hold them free therefrom. The lever C is now started, its non-conducting plate C² passing under the end of one of the rounded and slightly-recessed arms E. This throws the key e of this arm against its plate d, and the circuit is complete with one set of electro-magnets. But, so soon as this lever has reached this point, owing to the form of the arms, the other arm E has been so moved as to overcome the tension of its spring a, and its key strikes the plate, and instantly the circuit is interrupted with the first set of electro-magnets and completed with the second, when the full power of these electro-magnets is instantly exerted to cause a return movement of the lever. And this is continued, imparting a continuous oscillating or vibratory movement to the lever, and through it the machinery is driven.

It will be noticed that so soon as the pressure of the lever is removed the spring a instantly throws back its respective arm.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The forked or V-shaped armatures C C, when arranged so as to operate substantially as described.

2. The current-breaker arms E E and rod or wire E², when arranged in connection with the bar D having plates d d attached, substantially as described.

3. The vertical lever C and current-breaker arms E E, when the same are so combined and arranged as to operate substantially as described.

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

SOLOMON JONES.

Witnesses:

ROSALVO F. COLE,
ANTON LANGENSTERN.