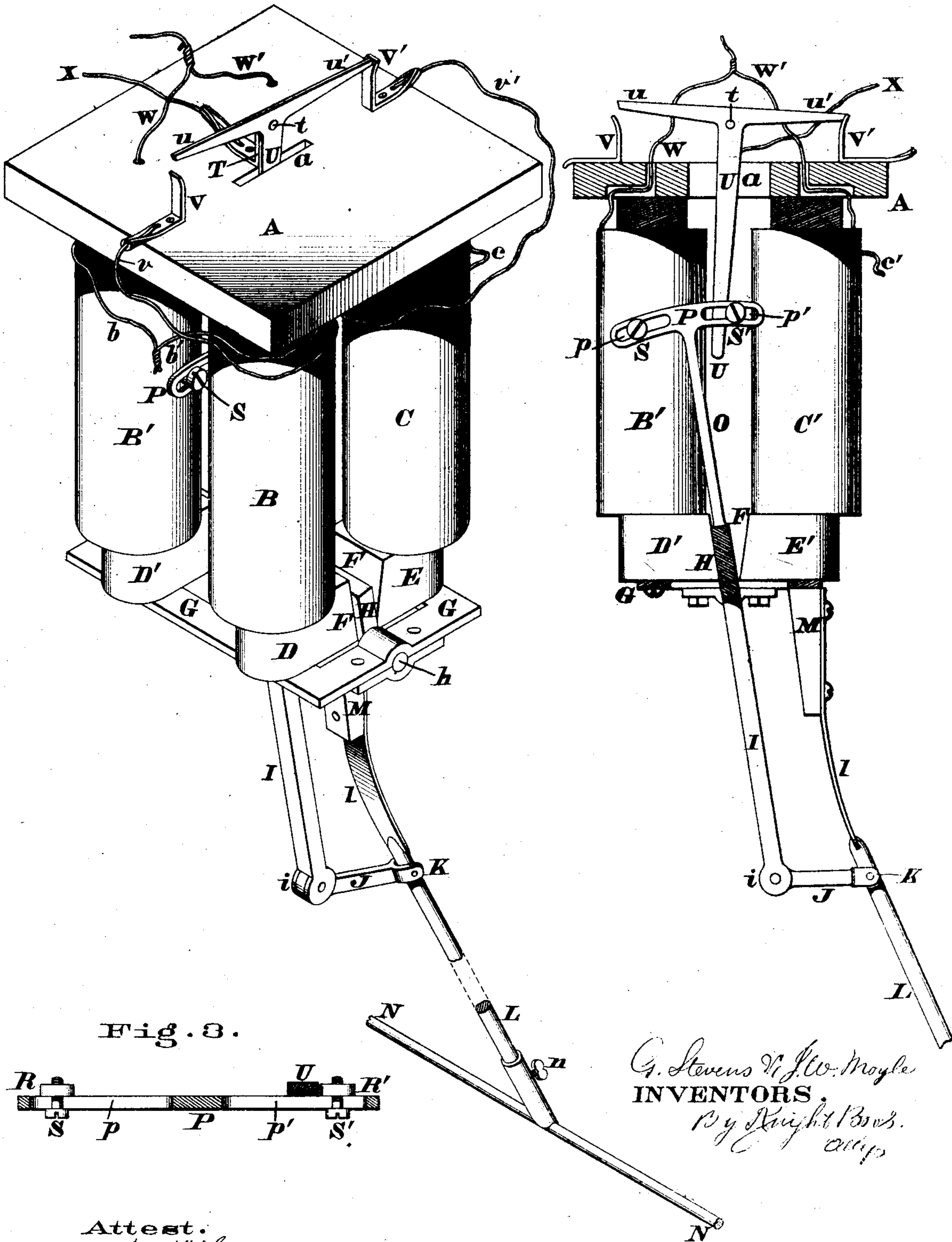


G. STEVENS & J.W. MOYLE.

Electro-Magnetic Fan.

Fig. 1. 116770 PATENTED JUL 4 1871 Fig. 2.



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# UNITED STATES PATENT OFFICE.

GEORGE STEVENS AND JAMES W. MOYLE, OF CINCINNATI, OHIO.

## IMPROVEMENT IN ELECTRO-MAGNETIC FANS.

Specification forming part of Letters Patent No. 116,770, dated July 4, 1871.

*To all whom it may concern:*

Be it known that we, GEORGE STEVENS and JAMES W. MOYLE, of Cincinnati, in the county of Hamilton and State of Ohio, have invented an Improved Electro-Magnetic Fan, of which the following is a specification:

This invention consists in imparting a vibratory movement to a fan by means of two or more electro-magnets, to which the currents of electricity are alternately introduced by a peculiarly-arranged automatic circuit-breaker, the details of which will be hereafter fully described.

Figure 1 is a perspective view of an electro-magnetic fan embodying our improvements. Fig. 2 is a vertical section of the same in the plane of the circuit-breaker; and Fig. 3 is an enlarged section, showing the arrangement of the adjustable tappets which actuate the circuit-breaker.

A represents a plate or table for supporting the operative parts of the apparatus, and depending therefrom are two pairs of electro-magnets, B B' C C'. The legs of these magnets terminate in projections D D' and E E'. These terminations of the legs project inwardly and are provided with inclined faces F, which oppose one another. Secured to the under side of projections D D' E E' is a frame, G, which affords journal-bearings for the gudgeons *h* of armature H, which is situated between the inclined faces of said projections. Depending from this armature is a lever, I, having pivoted to it at *i* a link, J, which is provided with a spade-handle, K, for engagement with the fan-rod L, whose upper end is furnished with a spring-connection, *l*. The spring *l* is attached to a stirrup, M, which projects from the lower side of frame G. Secured to the rod L, by a set-screw, *n*, is a cross-bar, N, to which the fan is attached, and said fan may be made of any proper material and of any suitable size. Projecting upwardly from the armature is an arm, O, terminating in a T-head, P, having slots *p p'* for the reception of tappets R R', which latter are maintained at any desired point within said slots by the set-screws S S'. Secured to the top of plate A is a bracket or support, T, to which is pivoted at *t* a circuit-breaker, which consists of a long arm, U, and two short arms, *u u'*, which project from the former at right angles. The lower end of arm U is adapted to be operated upon alternately by the tappets R R', and the ends of the smaller arms *u u'* are arranged so as

to be brought in contact with spring-plates V V'. The arm U vibrates within a slot, *a*, in the plate A. Attached to the spring-plates V V' are wires *v v'*, of which the one, *v*, communicates with the set of magnets B B', while the one, *v'*, is attached to the other set C C'. Wires *b b'* connect the magnets B B', and the other magnets C C' are connected by similar wires *c c'*. W. W' are wires leading from the battery to the magnets B B' C C', and X is a wire connecting the bracket T with the battery.

The operation of the apparatus is as follows: The wires W W' and X are first connected to the opposite poles of the battery and the apparatus started by hand. In case the fan-rod L should be moved in the direction, as shown in Figs. 1 and 2, the armature H is brought in contact with the inclined faces of the projections D D', and the arm *u'* of the circuit-breaker impinges against the spring-plate V', thereby causing the current of electricity to pass into the magnets C C'. The magnets C C' being thus charged the projections E E' attract the armature with sufficient force to draw it toward them, and by causing said armature to vibrate upon its gudgeons the rod L is thereby swung to an opposite position from that shown in the drawing. This opposite movement of the armature brings the tappet R in contact with the arm U and causes the arm *u* to descend and rest upon the spring-plate V and so charge the magnets B B'. As soon as the magnets B B' are charged the armature H is attracted to the ends D D', and this alternate charging of the magnets causes the armature to vibrate in the above-described manner as long as the wires W W' X are in communication with the battery. The spring-plates V V', by impinging against the ends of the arms *u u'*, prevent any movement of the circuit-breaker except when it is actuated by the tappets R R'.

The operative parts, which are shown in the drawing, are intended to be concealed within an ornamental casing, through which the rod L will project, and said box or casing is to be attached to the wall, ceiling, or canopy of a bed, in order that the fan may be located wherever its services will be most convenient and desirable.

The wires which communicate with the battery may be concealed behind the wall-paper, and the battery may be situated in the garret, cellar, or any other convenient place.

In the drawing two distinct sets of magnets are shown; but it is evident that a greater or less number may be employed, as circumstances may direct.

We claim as our invention—

1. A pair of magnets B C having inwardly-projecting legs D E, which terminate in the inclined faces F, when used in connection with the vibrating armature H *h* and fan-operating devices I J L, as herein explained.

2. The combination of the supporting-table A *a*, electro-magnet B C, inwardly-projecting

legs D E, inclined faces F, vibrating armature H, lever I J, vibrating fan-rods L N, arms O P *p p*, tappets R R', circuit-breaker U *u u'* T *t*, spring-plates V V', and wires *v v'* W W' X, for the object stated.

In testimony of which invention we hereunto set our hands.

GEORGE STEVENS.  
J. W. MOYLE.

Witnesses:

GEO. H. KNIGHT,  
JAMES H. LAYMAN.