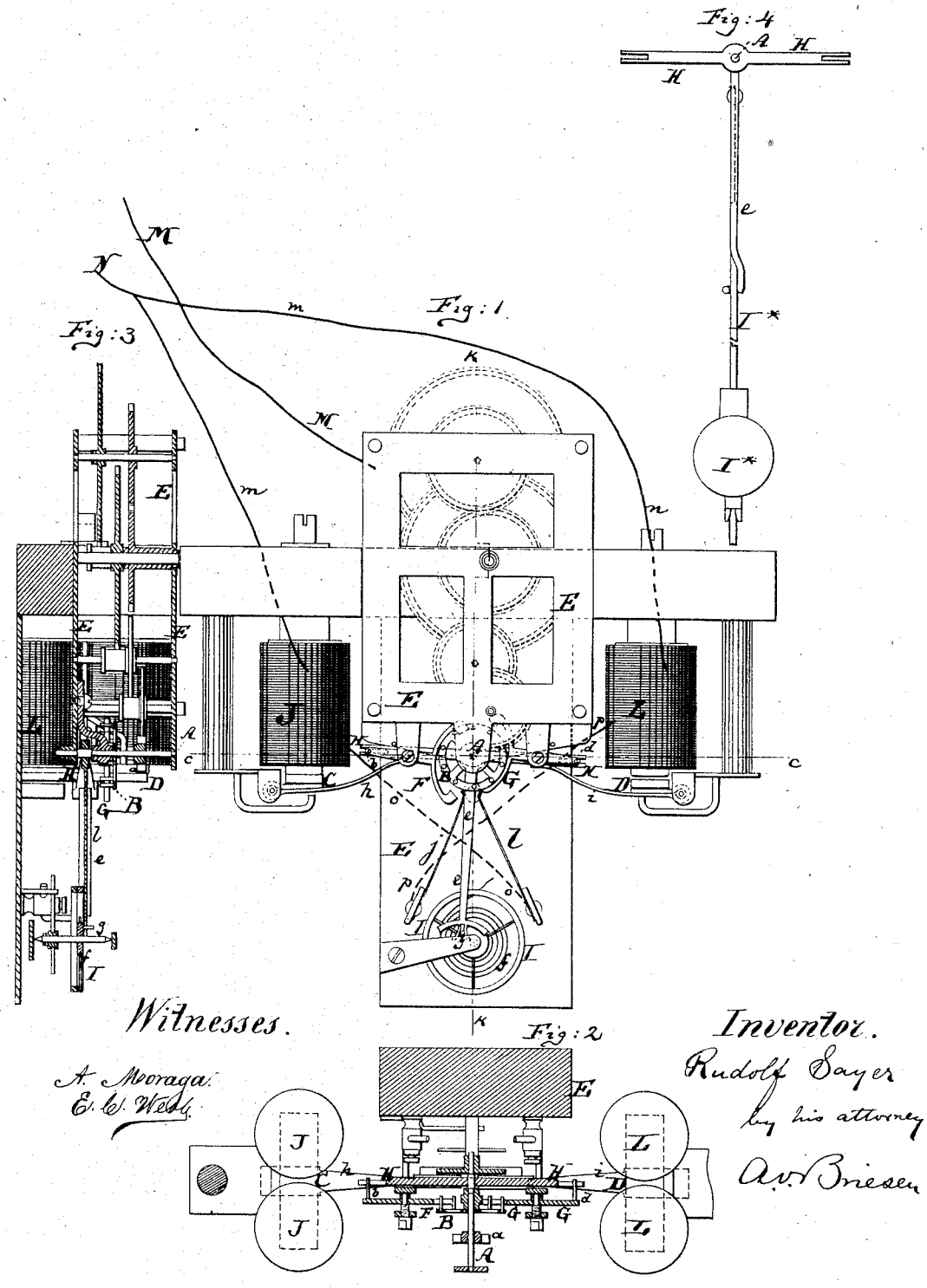
R. SAYER.

Electric Clocks.

No. 155,261. Patented Sept. 22, 1874.



Witnesses.

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UNITED STATES PATENT OFFICE.

RUDOLF SAYER, OF NEW YORK, N. Y.

IMPROVEMENT IN ELECTRIC CLOCKS.

Specification forming part of Letters Patent No. **155,261**, dated September 22, 1874; application filed August 5, 1874.

To all whom it may concern:

Be it known that I, RUDOLF SAYER, of New York, in the county and State of New York, have invented a new and Improved Electric Clock-Work, of which the following is a specification:

Figure 1 is a face view of my improved electric clock-work, showing it connected with a balance-wheel and spring. Fig. 2 is a horizontal section of the same, taken on the plane of the line *c c*, Fig. 1. Fig. 3 is a vertical transverse section of the same, taken on the line *k k*, Fig. 1. Fig. 4 is a face view of a pendulum attachment that can be used on the clock in place of the balance-wheel.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to an improved arrangement of mechanism, for converting the oscillating movement of magnetic armatures into rotary movement of clock-work, such as is used for indicating the time of day, or such as is used on printing apparatus or for other suitable purposes.

The invention consists in a new combination of parts, as hereinafter more clearly pointed out.

The letter A in the drawing represents the spindle of an escapement-wheel, B, to which intermittent rotary motion is to be imparted by the armatures C and D of two electro-magnets. The spindle A has its bearings in a suitable frame, E, which is the frame of the clock-work, and said spindle carries a pinion or toothed wheel, *a*, of suitable character, for transmitting its movement to a train of wheels that constitutes the clock-work. This train of wheels is indicated by dotted lines in Fig. 1, and shown in section in Fig. 3. It is used to move the hands of a time-indicator in front of a suitable dial, or to turn a printing-wheel with the requisite speed, or for other suitable purpose. The escapement-wheel B has a suitable number of teeth or pins, ten being indicated in Fig. 1, and between these teeth engage the pallets of two anchors, F and G. These anchors are pivoted in the frame E, at opposite sides of the spindle A. From the shanks of these anchors project pins *b* and *d*, respectively, into the slotted or recessed ends of a pivoted bar, H. The pivot of this bar is in line with the axis of the spindle A; in fact I prefer to hang said bar loosely on the spindle, as indicated in Fig. 2. An arm, *e*, projects from the middle of the bar H, and at right angles thereto, toward a balance-wheel, I, which is actuated by a suitable balance-spring, *f*. The end of the arm *e* is forked, and straddles a pin, *g*, on the balance-wheel in the manner clearly indicated in Fig. 1. The two armatures C and D, are pivoted opposite the ends of two electro-magnets, J and L, respectively. A projecting arm, *h*, on the armature C, extends under one end of the bar H, while an arm, *i*, projecting from the armature D, extends under the other end of said bar H. *j* and *l* are two springs, which, though of metal, are metallically insulated from the frame E of the clock-work, and which have the tendency to bear against opposite sides of the arm *e* when the same is in its central position, but which have not the capacity of following said arm as it swings away from them, respectively. The battery from which the power for moving the clock-work is to be derived connects, by one wire, M, directly with the metallic frame E, as shown, which wire is therefore in metallic connection with all the parts enumerated, except the springs *j* and *l*, and the electro-magnets J and L, which are insulated from E. The other wire, N, from the battery is forked, one branch, *m*, connecting with the magnet J, and the other branch, *n*, with the magnet L. A wire, O, extends from the magnet J to the spring L, and another wire, *p*, from the magnet L to the spring *j*, as shown in Fig. 1.

Now, if the armature C is brought against J for starting the work, the arm *h* will swing one end of the bar H up, and thereby bring the upper pallet of the anchor F between the teeth of the wheel B, and also bring the lower pallet of the anchor G between the teeth of said wheel, for both anchors are vibrated by the bar H whenever the same is vibrated by one of the armatures. By the action named the wheel B receives a slight motion, and all the parts are brought into the position indicated in Fig. 1, the arm *e* being also carried aside against the spring *j*, and away from the spring *l*. Metallic contact with the spring *l* being thus interrupted, the magnet J will cease to attract the armature C,

while at the same time a current is established through the electro-magnet L, wire *p*, and spring *j*. This will cause the armature D to be swung up, and the bar H to be vibrated by the arm *i*, so that the upper pallet of G and the lower pallet of F will enter and affect the wheel B, and so that furthermore metallic connection between *e* and *l* will be resumed, while *e* and *j* are separated. This will bring the armature C into play again, and so forth.

Now, it will be observed that this invention will also work when but one anchor and one armature and electro-magnet should be used; but I prefer to use these parts duplicated, as shown, in order to obtain greater steadiness and certainty of action. In place of the balance-wheel I a pendulum, I*, may be used on the arm *e*, as indicated in Fig. 4.

I claim as my invention—

In an electric clock-work, the combination of the escapement-wheel B, and its anchor or anchors with the pivoted bar H, arm *e*, insulated springs *j l*, and one or more armatures, all arranged for operation, substantially as specified.

RUDOLF SAYER.

Witnesses:
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