E. WILSON.

Improvement in Electric Clocks.

No. 124,104. Patented Feb. 27, 1872.

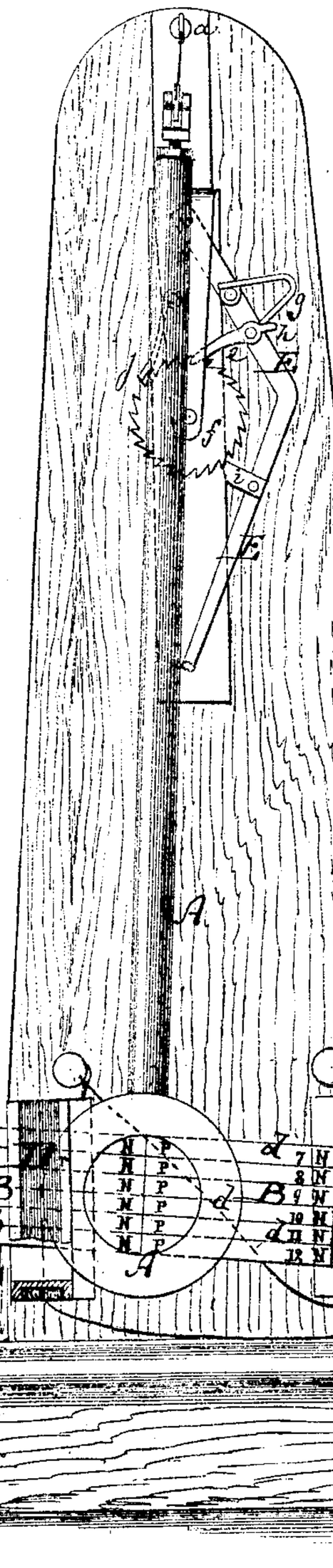

Fig. 1.

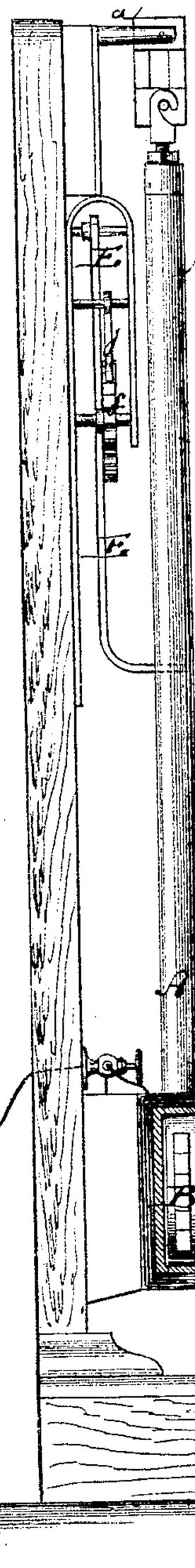

Fig. 2.

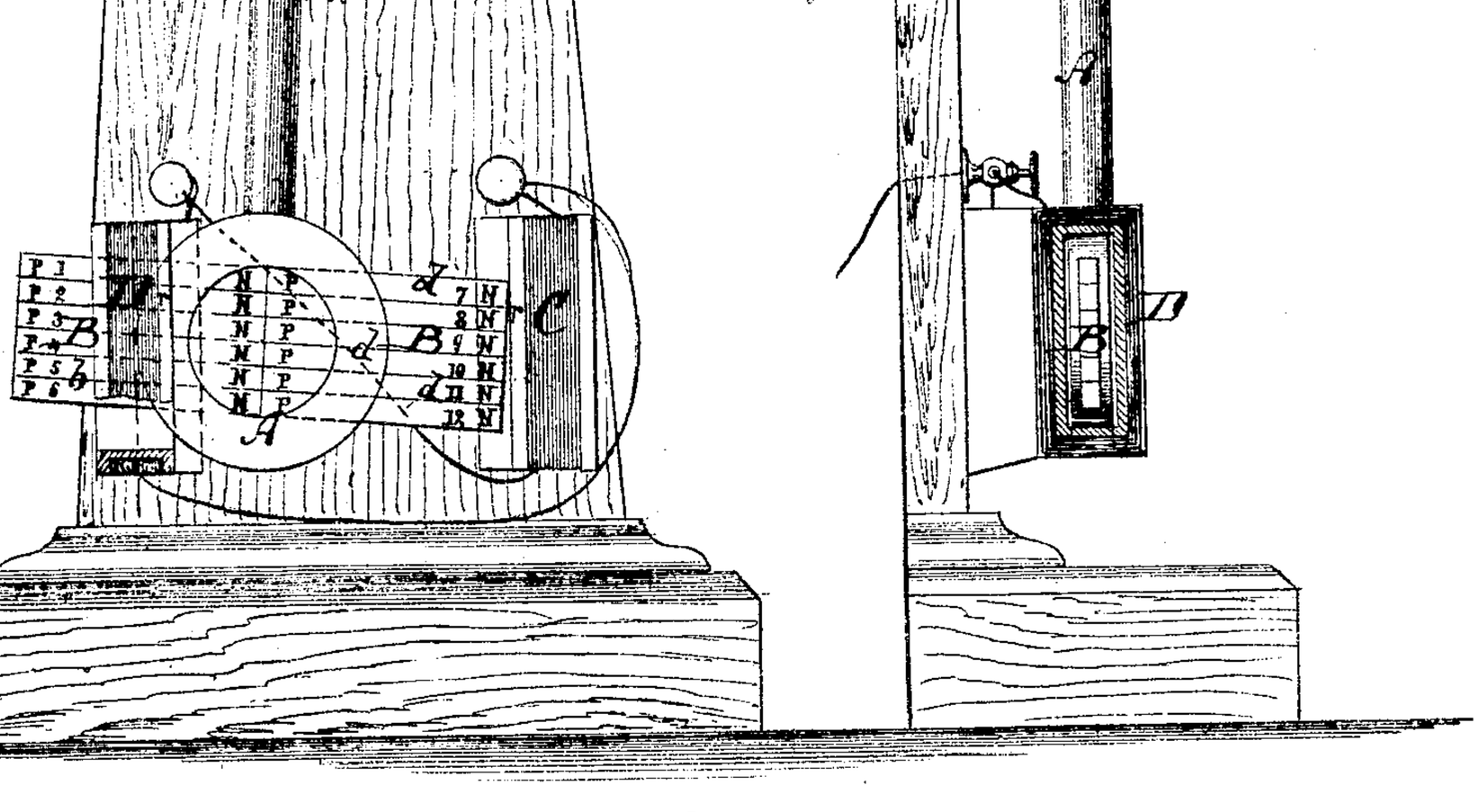

Fig. 3.

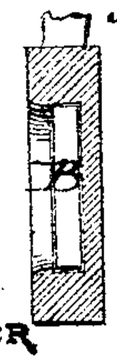

Fig. 4.

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124,104

UNITED STATES PATENT OFFICE.

ELISHA WILSON, OF ELIZABETH, NEW JERSEY.

IMPROVEMENT IN ELECTRIC CLOCKS.

Specification forming part of Letters Patent No. 124,104, dated February 27, 1872.

Specification describing a new and Improved Electric Clock, invented by ELISHA WILSON, of Elizabeth, in the county of Union and State of New Jersey.

Figure 1 is a front view, and Fig. 2 an edge or side view of my improved electric clock. Fig. 3 is a detail face view of the pendulum-magnet; and Fig. 4 is a transverse section of the same on the line *c c* of Fig. 3.

Similar letters of reference indicate corresponding parts.

This invention relates to a new mechanism for transmitting motion from the vibrating pendulum of an electric clock to the train of wheels that connects with the hands; also, to a new arrangement of compensating pendulum-magnet and compensating-coil. The invention consists, first, in providing the lever, which is directly vibrated by the pendulum, with a projecting stop, that extends directly toward the ratchet-wheel of the works, and holds the same arrested after every motion imparted to it by the pawl. The invention also consists in the use of a simple and adjustable rest for the pawl, whereby it can be set to take into a suitable desired number of teeth at every stroke. The invention also consists in the arranging the parts of a compound permanent magnet on the pendulum in two or more consecutive polar sections, both to increase its magnetic force and also to obtain an automatic compensating arrangement; and in the application of different metals at the contact or breaking points of the electric circuit.

A in the drawing represents the pendulum, suspended in the usual manner; E E, the pawl-lever; *e*, the pawl; *j*, the dog; *f*, the ratchet-wheel; *i*, the catch or stop; C, the repelling and D the compensating coils, fixed; and D, Fig. 3, the compensation-coil upon the magnet B, and movable with it. B B, Fig. 1, is the permanent magnet, consisting of twelve (more or less) bars, numbered 1, 2, 3, &c., of which P, &c., represent the positive, and N N, &c., the negative poles. In Fig. 3, the magnet B B consists of only two bars, each touching one end of the other, of opposite polarities, on the line *c c*. A compound permanent magnet consists of two or more magnets in continuous contact, with like poles together. My compensation-magnet has only one each of unlike poles in contact, as shown at N P N P, Figs. 1 and 3. Suppose B B, Fig. 3, to be one solid bar with a magnetic force equal to sixteen units: arrange two bars, as in the drawing, whose united length shall equal or somewhat exceed the first, and their joint energy will be increased to seventeen or more units of force by mutual reaction. This arrangement I term the compensation-magnet. The compensation electric coil D is used in connection, with or without the repelling-coil C, and in combination with a permanent magnet. Its object and use are to compensate for any loss of magnetic force by the repelling-coils or by any other cause. I find, by experience, when one or more repelling-coils are employed alone, the magnet becomes gradually neutralized and inefficient. The compensation-coil and the repelling-coil may be connected in the electric circuit side by side, so as to divide the current between them, as represented in Fig. 1, or consecutively. The electric current through each coil must be such that the inside poles *r r* of the electric coils shall be alike. The current would thus have opposite directions through each. When the coils are of equal force, the dissipating effects of coil C upon the pole N of the magnet are fully compensated by the coil D. If, therefore, the latter coil is made stronger than the former, the active forces of the magnet are rather improved by use. The connecting points in the electric conductors are positive and negative to each other, and are rapidly corroded by frequent repetitions of breaking and closing the circuit. This, being especially hurtful in connection with clocks, is largely overcome by making the two opposite points of different metals. As all metals have different electric affinities with reference to each other, any two different metals will be more enduring in resisting oxidation at the breaking points than any one metal alone. E is the lever, pivoted to the frame of the clock, and vibrated by being struck by the pendulum. To it is pivoted the pawl *e*, which engages with a toothed wheel, *f*, and imparts intermittent rotary motion to the same. A bent metal wire or its equivalent, *g*, engages the back spur *h* of the pawl *e*, and regulates the point to which the same may drop when off the wheel, and consequently, also, the number of teeth which it engages at each stroke. By bending the rest *g*, the position of the pawl

can be varied at will. *i* is an arm projecting from the lever E, and striking against a tooth of the wheel *f* whenever the said lever descends. The arm *i* thus serves the double purpose of arresting the lever and locking the wheel *f*, so that the same cannot turn further than as absolutely turned by the pawl *e*. *j* is the dog, bearing against the wheel *f*, and preventing its backward motion.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The compensating-magnet B B, made substantially as herein shown and described.

2. The compensating-coil D, arranged either stationary or movable, on an electric clock, in connection with or without the repelling-coil C, substantially as set forth.

3. The connecting points in an electric conductor made of different metals, as set forth.

4. The bent rest *g*, arranged, in combination with the pawl *e* on the lever E of an electric clock, as specified.

5. The arm or catch *i* formed on the lever E, to stop the same and catch the wheel *f*, substantially as herein shown and described.

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