(No Model.)

G. G. WAGNER.

SYNCHRONIZING CLOCK.

No. 281,585. Patented July 17, 1883.

Fig: 1.

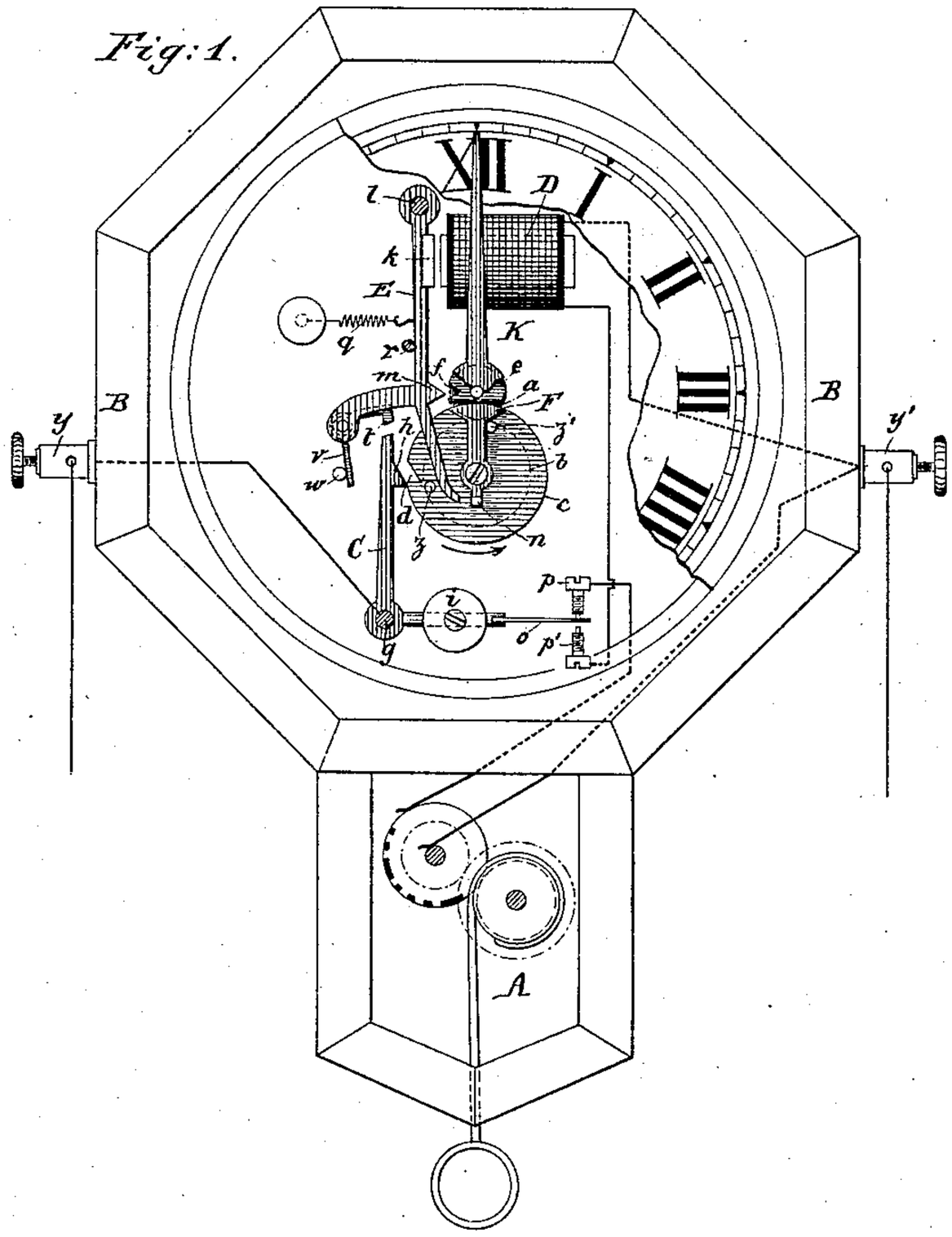
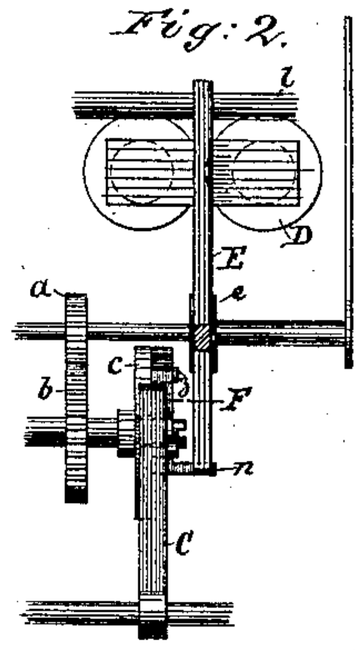


Fig: 2.



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GUSTAVUS G. WAGNER, OF MOUNT VERNON, NEW YORK.

SYNCHRONIZING CLOCKS.

SPECIFICATION forming part of Letters Patent No. 281,585, dated July 17, 1883.

Application filed April 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVUS G. WAGNER, of Mount Vernon, in the county of Westchester and State of New York, have invented a certain new and useful Improvement in Synchronizing Clocks, of which the following is a specification.

My invention relates to that class of devices whereby each one of a system of clocks located in an electric circuit is set and corrected from a central station; and the object of my invention is to provide a method and apparatus for synchronizing a system of clocks located in connection with the call-boxes and on the line of a district-telegraph service. This object I accomplish by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a view of a call-box and clock provided with my improved synchronizing mechanism; and Fig. 2 is a side elevation, partly in section, of the hand-setting mechanism.

In the two views similar letters refer to similar parts.

A is the call-box, and B the clock-frame, which is provided with two binding-posts, *y y'*.

The arbor of the minute-hand of the clock carries a gear, *a*, which engages with another gear, *b*, twice the diameter of *a*.

Secured to the gear *b* is a disk, *c*, in the periphery of which there is a notch, *d*.

The minute-hand K is loosely mounted on its arbor, and carries a disk, *e*, in which there is formed a V-shaped notch, *f*.

A bell-crank lever, C, is secured to the frame-work of the clock at a point, as *g*, and the upper arm of this lever carries a catch, *h*, which is held against the periphery of the disk *c* by the action of a weight, *i*, which is secured to the lower arm of the lever.

An electro-magnet, D, is mounted behind and above the center of the dial of the clock, and its armature *k* is carried by a lever, E, which is pivoted to the frame-work at a point, as *l*. This lever is provided with a wedge-shaped projection, *m*, arranged so as to enter the notch *f* at certain times, as will be more fully explained. The lower end of the lever E is curved inward toward the center line of the clock and passes in front of the disk *c* in such position as to strike the arm *n* of a segment, F, when the lever is moved by the charging of the magnet D. The radius of the segment F is equal to that of the disk *c*, and their axes are concentric. The relative range of motion of the segment F is limited by the two pins *z z'*, which project from the surface of the disk *c*.

The operation of my improved synchronizing mechanism is as follows: When the catch *h* of the lever C is resting against the periphery of the disk *c*, the call-box A will be in circuit, the normal line running from the binding-post *y* to the lower arm of the lever C, thence through the flexible point *o* of the lower arm to the contact-point *p*, and from thence to the call-box and on to line, as is clearly shown in the drawings. As before stated, the weight *i* on the lower arm of the lever C acts to keep the catch *h* against the periphery of the disk *c*, so that when in the course of the rotation of the disk the notch *d* comes to a point opposite the catch the lower arm of the lever will be free to drop, and the catch will enter the notch. This movement of the lever C breaks the connection with the call-box and throws the electro-magnet D into circuit as the flexible point *o* will be carried from the contact-point *p* to the point *p'*, which is connected with a line leading to the magnet D, and from thence to the binding-post *y'*. The electro-magnet D is so constructed that the ordinary current used in the district messenger service is not strong enough to charge it with sufficient force to overcome the resistance of the spring *q*, which holds the lever E back against the pin *r*. The disk *c* is so timed that the notch *d* will be opposite the catch *h* a few moments before the time taken for setting the clocks; and the same is true of the notch *f* and projection *m*, so that just prior to the time agreed upon for correcting the secondary clocks the call-boxes will be thrown out of connection with the line and the electro-magnets will be in circuit. An instant before the hands of the central regulating-clock point to the time to which it is desired to set the hands of the secondary clocks a strong current is thrown on the line, and the electro-magnet is at once so charged as to attract its armature with sufficient strength to overcome the resistance offered by the spring *q*, and thus move the lever E, so that the projection *m* will enter the notch *f* and move the hand to a predetermined point on the

dial. As the lever E moves forward it strikes the arm *n* of the segment F, thus throwing the segment out of a perpendicular position, so that it will drop down upon the catch *h*. The heavy current is continued until the hands of the regulator-clock reach a point corresponding to that to which the hands of the secondary clocks have been made to point, at which instant the normal current is restored. The cutting out of the heavy current partially discharges the electro-magnet D, and the lever E is at once drawn back by the action of the spring *q*, carrying with it the upper arm of the lever C, with which it was in engagement through the medium of the hook *t*. This hook *t* has a downwardly-projecting arm, *v*, which, as the lever E is drawn back, strikes against the pin *w* and raises the hook, thereby releasing the lever C. When the catch *h* is withdrawn from the notch *d* the segment F falls down upon the pin *z*, and as the catch *h* projects out beyond the surface of the disk *c* it will bear against the edge of the segment when the lever C is released.

In the arrangement shown in the drawings the synchronizing of the clocks would take place every two hours; but it is clear that if the gear *a* was so mounted as to move with the hour-hand the synchronizing would be done but once in twenty-four hours, or, say, at midnight.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The herein-described method of setting a system of clocks located on the line of a district messenger service, which consists in cutting the call-boxes out of line and causing the current to pass over a loop in which the electro-magnet controlling the hand-setting mechanism is located, in then increasing the strength of the current to charge the magnet and thereby actuate the hand-setting mechanism, continuing the heavy current until the hands of the central clock point to a position corresponding to that to which the hands of the secondary clocks have been made to point, and in then restoring the normal current, substantially as described.

2. The combination, with a mechanism for breaking the connection with the call-box and establishing a connection with an electro-magnet adapted to be operated by an increased current, of a hand-setting mechanism controlled by said electro-magnet, substantially as described.

3. The combination, with a lever, as C, provided with a catch, as *h*, of a disk, as *c*, gears, as *a b*, segment, as F, electro-magnet, as D, lever, as E, provided with a projection, as *m*, and a clock-hand, as K, provided with a notch, as *f*, substantially as described.

4. The combination, with a lever, as C, provided with a catch, as *h*, of a disk, as *c*, a segment, as F, and gears, as *a b*, substantially as described, and for the purpose specified.

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Witnesses:
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