

(No Model.)

A. G. WISEMAN.  
ELECTRIC CLOCK SYNCHRONIZER.

No. 387,276.

Patented Aug. 7, 1888.

Fig. 1.

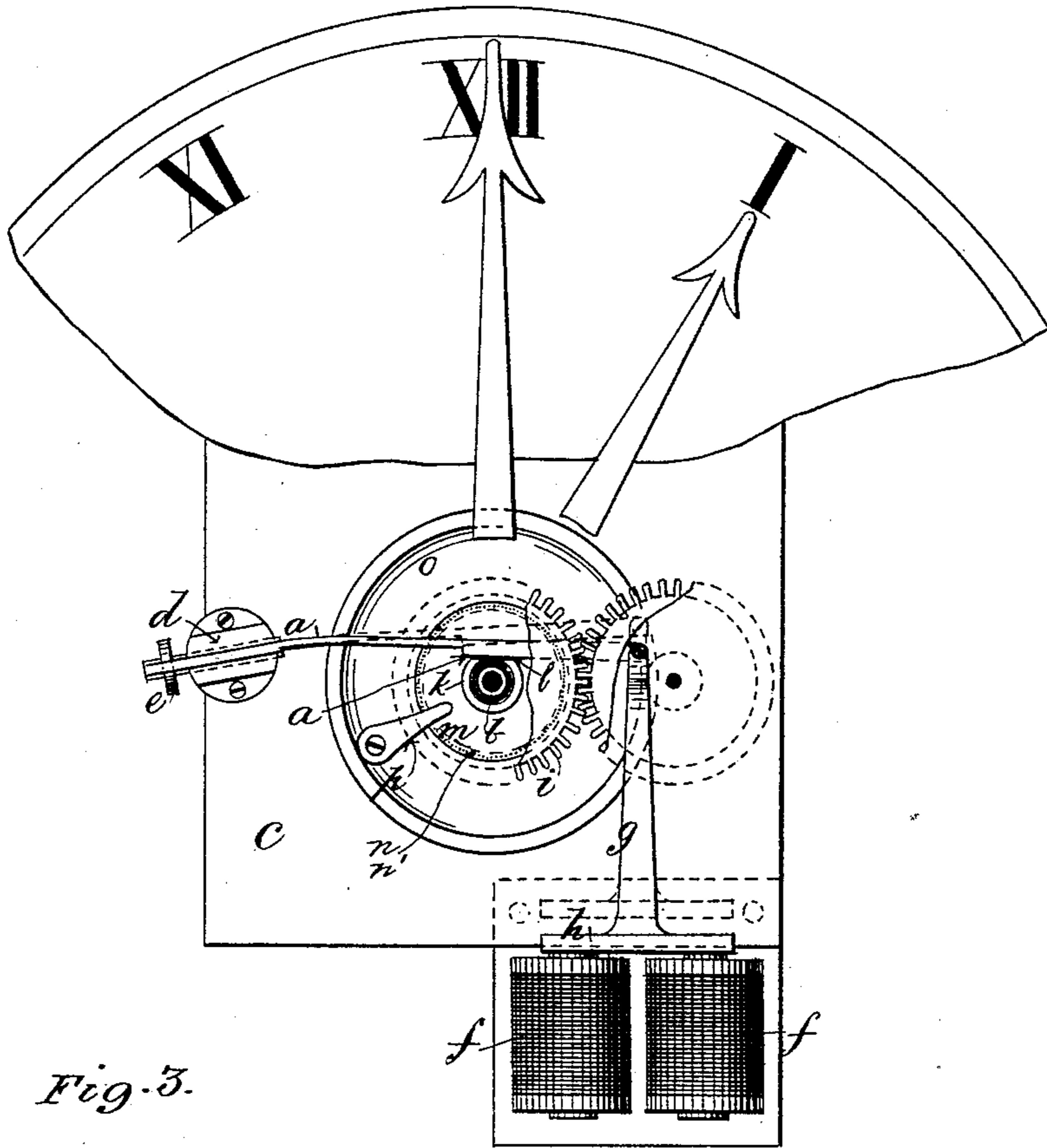


Fig. 3.

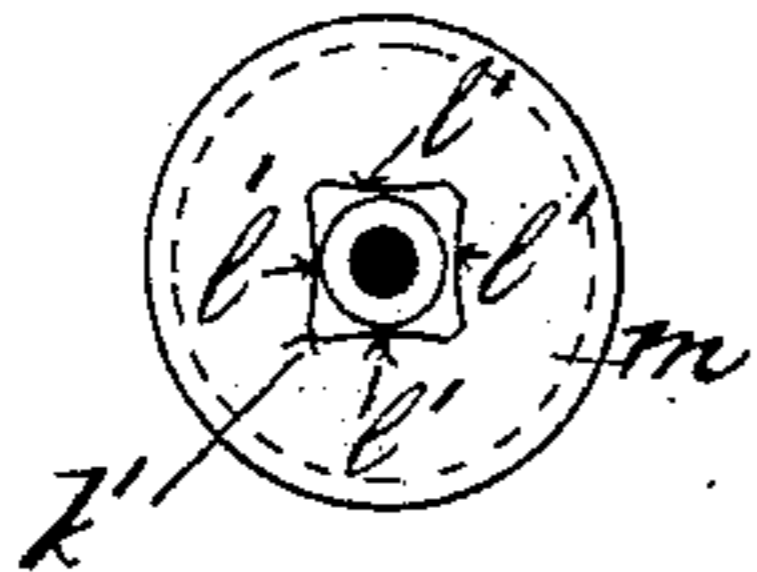
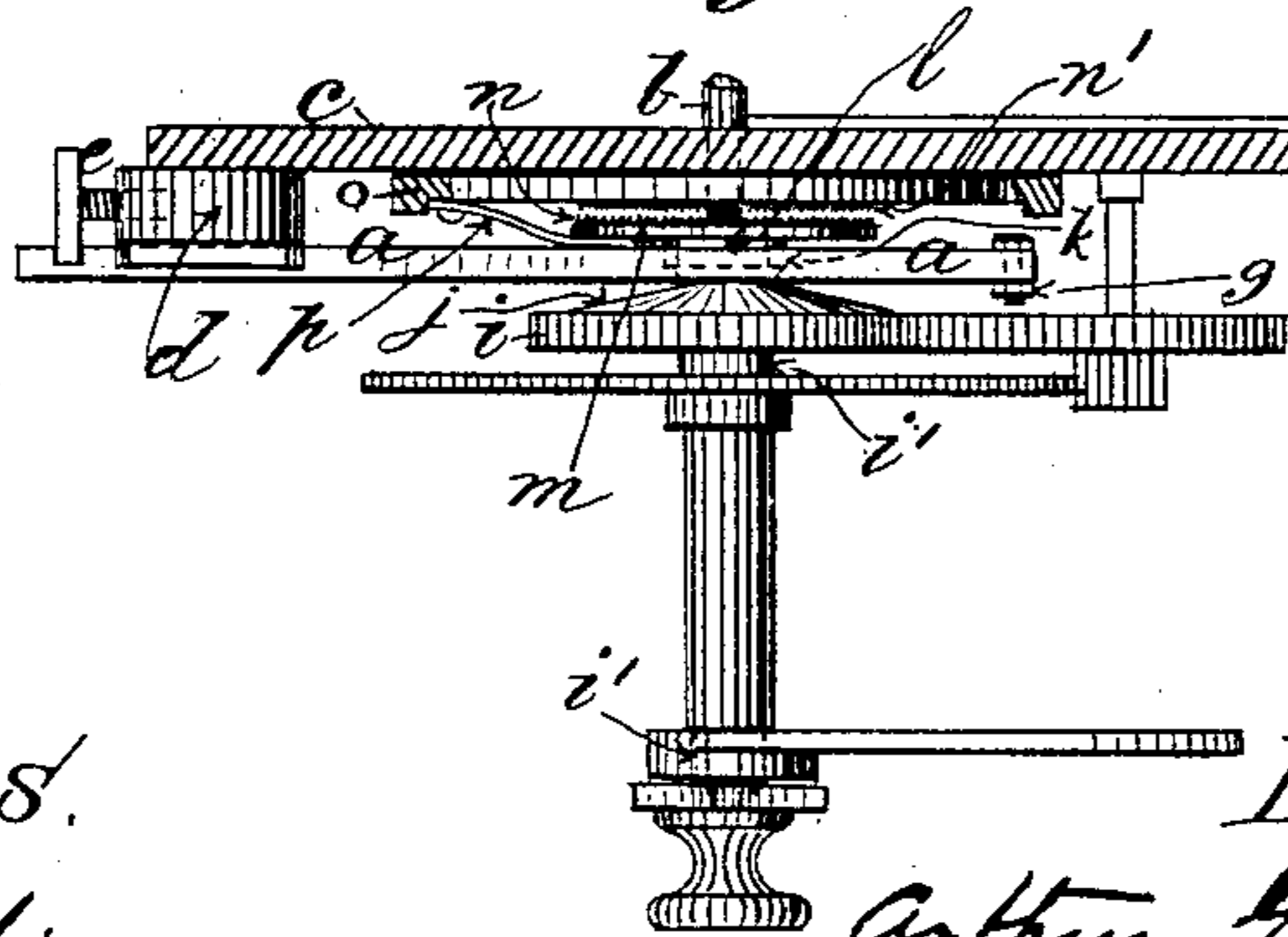


Fig. 2.



WITNESSES.  
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# UNITED STATES PATENT OFFICE.

ARTHUR G. WISEMAN, OF ST. LOUIS, MISSOURI.

## ELECTRIC CLOCK-SYNCHRONIZER.

SPECIFICATION forming part of Letters Patent No. 387,276, dated August 7, 1888.

Application filed April 17, 1888. Serial No. 270,907. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR G. WISEMAN, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have  
5 invented a certain new and useful Improvement in Clock-Synchronizers, of which the following is a full, clear, and exact description.

My invention relates to improvements in clock-synchronizing devices, whereby a current of electricity transmitted from a regulating-clock once every hour or at suitable intervals is caused to automatically regulate or  
10 synchronize a clock (or clocks) by bringing the minute-hand exactly to the point of twelve on the dial; and my invention has for its object to provide a simple and inexpensive arrangement which is positive in action and readily applied without disconnecting the clock-work.

20 It consists in a spring-lever fulcrumed to the clock to be regulated and having its free end in communication with a suitable electro-magnet, combined with the minute-hand toothed wheel having one side conical and provided with a specially-shaped hub carrying a  
25 toothed plate for gearing into corresponding teeth or holes in the face of the actuating friction-disk of the minute-hand spindle and with a spring or springs, the whole operating so that on the depression of the spring-lever by  
30 the electric current the minute-hand of the clock is brought exactly to the point of twelve on the dial, as hereinafter more particularly described.

35 On the accompanying drawings, Figure 1 represents a front elevation, broken away, of my improved synchronizer as applied to a clock; Fig. 2, a sectional plan thereof, and Fig. 3 is a modification of the hub on the minute-hand.

40 Like letters of reference denote like parts in all the figures.

*a* represents a spring arm or lever, which is arranged longitudinally above the actuating-spindle *b* of the minute-hand somewhat in front  
15 of and parallel with the front plate, *c*, of the clock. The spring-lever *a* is fulcrumed at *d* to the front plate, *c*, and may be adjusted longitudinally in its fulcrum *d* by a set-screw, *e*, the head of which engages at its periphery in  
50 a slot formed on the inside of the spring-lever *a*, or this adjustment of the latter may be other-

wise effected. The free end of the spring-lever *a*, which extends beyond the spindle *b*, is subjected to the influence of an adjacent electro-magnet, *f*, by means of the bar or link *g*, depending from the end of lever *a* and carrying  
55 an armature, *h*, or by other suitable means.

The minute-hand toothed wheel *i* has its inner side, *j*, cone-shaped, decreasing outwardly toward the center of the wheel *i*, where it is  
60 formed or provided with a projecting boss or hub, *k*, which is circular, except where formed with a depression or flat, *l*. On the end of the boss or hub *k* farthest from the wheel *i* is fixed a circular plate, *m*, on the face of which are  
65 teeth *n*, arranged at equal radial distances from the center of the plate *m* and of a pitch corresponding with every half-minute on the clock-dial, or in number one hundred and twenty or any other desired pitch, as found most suitable. 70

The actuating minute-hand spindle *b* passes centrally through the toothed wheel *i*, with its minute-hand tube or sleeve *i'*, conical surface *j*, boss or hub *k*, and circular plate *m*, the teeth *n* of which normally engage with corresponding  
75 teeth, *n'*, on the face of the friction-disk *o*, which actuates the spindle *b* and is retained in this position (except when otherwise constrained) by a spring, (or springs,) *p*, attached at one end to the disk *o* and its free end bearing against  
80 the rear side (adjacent to the hub *k*) of the circular plate *m*. The minute-hand is attached to the tube or sleeve *i'* of the wheel *i* in the usual manner and in such position as to be at right angles with the flat *l* on the boss or hub *k*. 85

The spring-lever *a* normally assumes the position indicated by dotted lines in Fig. 1, and is at such distance from the front plate, *c*, of the clock that when the circular plate *m* is engaged with the friction-disk *o* the lever *a* is  
90 vertically over the larger conical surface, *j*, of the minute-hand toothed wheel *i*. This lever is formed on its under side where facing the conical surface *j* with a flat or surface corresponding with the flat *l* on the boss or hub *k*. 95

The various parts being in their normal relative positions, as above described, and the minute-hand some minutes behind or in advance of the hour when the synchronizing is to be effected, the electric current being transmitted  
100 from the regulating-clock to the magnet *f* attracts the armature *h* and pulls down the

spring-lever *a*, so that the under side of the latter rides over the conical surface *j* of the wheel *i*, and thereby constrains the wheel *i* forward along the spindle *b*, so as to disengage the toothed plate *m* from the toothed disk *o*, or into the position shown in Fig. 2, when the wheel *i*, being free and the spring-lever *a* striking one end of the flat *l* on the boss or hub *k*, the wheel *i* will be thereby partially rotated until its flat *l* coincides with and is held by the under side of the lever *a*, in which position the minute-hand will be exactly at the point of twelve on the dial. On the cessation of the current the spring-lever *a* will fly back to its original position or clear of the flat *l* and cone *j*, and the spring *p* will return the plate *m*, with wheel *i*, into engagement with the actuating-disk *o*, as before.

If desired to synchronize the clock, say, every fifteen minutes, the boss or hub *k* (see Fig. 3) of the minute-hand wheel *i* is formed on its periphery with four equidistant depressions or concave surfaces, *l'*, in lieu of a single flat, *l*, as described in Figs. 1 and 2.

If on depression of the spring-lever *a* the flexure thereof throws the minute-hand slightly to one side of the point of twelve on the dial, by turning the set-screw *e* in the direction as required the spring-lever *a* may be so adjusted as to compensate for this defect and bring the minute-hand to its correct position.

I claim as my invention—

1. In a clock-synchronizing device, the combination of the minute-hand toothed wheel *i*, having a conical surface, *j*, and boss or hub *k*,

formed with one or more flats or depressions, *l*, (or *l'*), and carrying toothed plate *m*, for engaging with toothed friction-disk *o*, actuating clock-work, spindle *b*, with spring arm or lever *a*, fulcrumed to clock, and spring *p*, substantially as shown, and for the purpose described.

2. In a clock-synchronizing device, the combination of the minute-hand toothed wheel *i*, having a conical surface, *j*, and boss or hub *k*, formed with one or more flats or depressions, *l*, (or *l'*), and carrying toothed plate *m*, for engaging with toothed disk *o*, actuating clock-work spindle *b*, with spring arm or lever *a*, fulcrumed adjustably by set-screw *e* to clock, and spring *p*, substantially as shown, and for the purpose described.

3. In a clock-synchronizing device, the combination of the minute-hand toothed wheel *i*, having a conical surface, *j*, and boss or hub *k*, formed with one or more flats or depressions, *l*, (or *l'*), and carrying toothed plate *m*, for engaging with toothed disk *o*, actuating clock-work spindle *b*, with spring arm or lever *a*, fulcrumed to clock and having bar or link *g*, carrying armature *h*, magnets *f*, and spring *p*, substantially as shown, and for the purpose described.

In testimony whereof I affix my signature, in presence of two witnesses, this 10th day of April, 1888.

ARTHUR G. WISEMAN.

Witnesses:

S. L. SCHRADER,  
PAUL BAKEWELL.