

(No Model.)

A. G. WISEMAN.  
CLOCK SYNCHRONIZER.

No. 452,299.

Patented May 12, 1891.

Fig. 1.

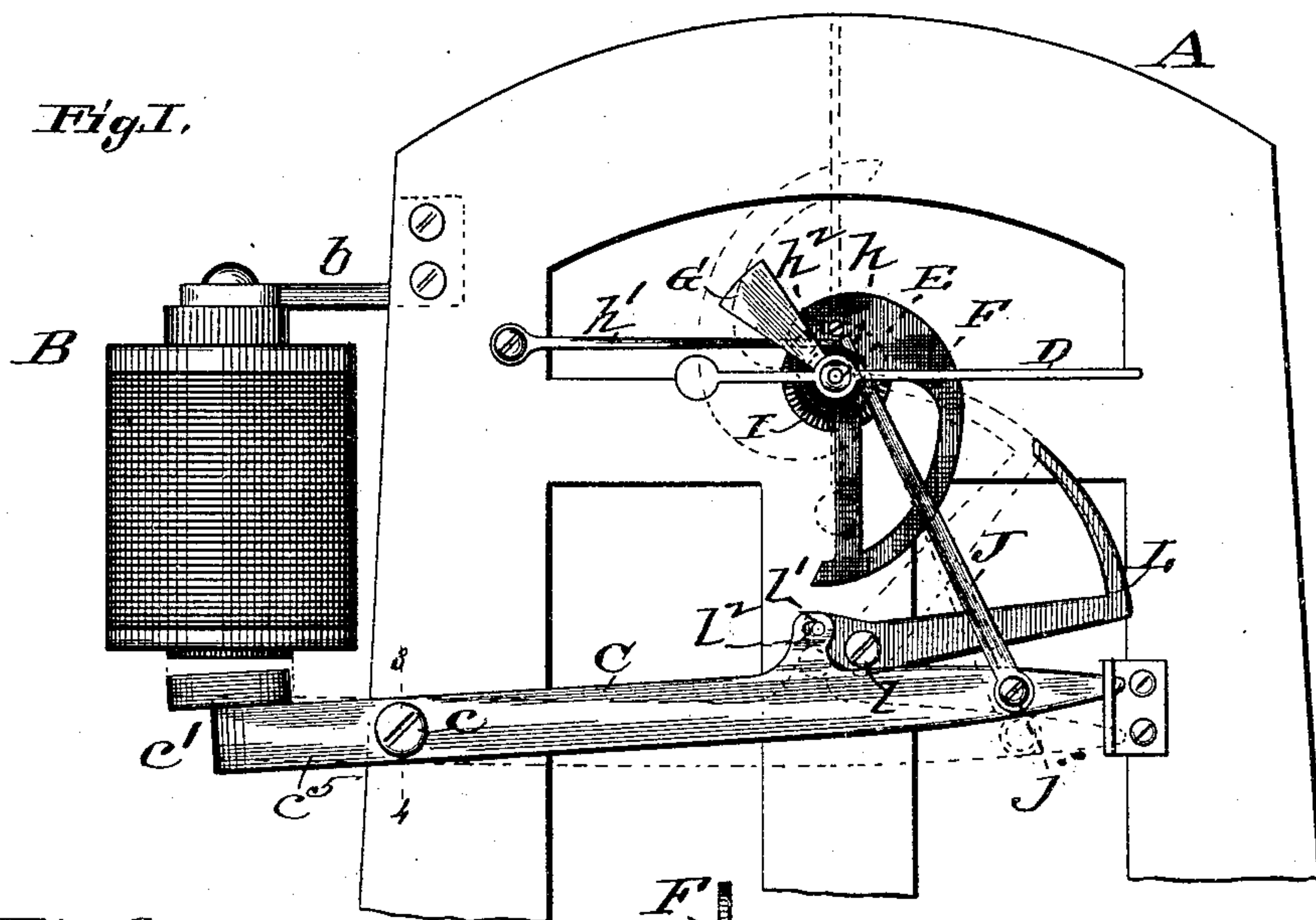


Fig. 2.

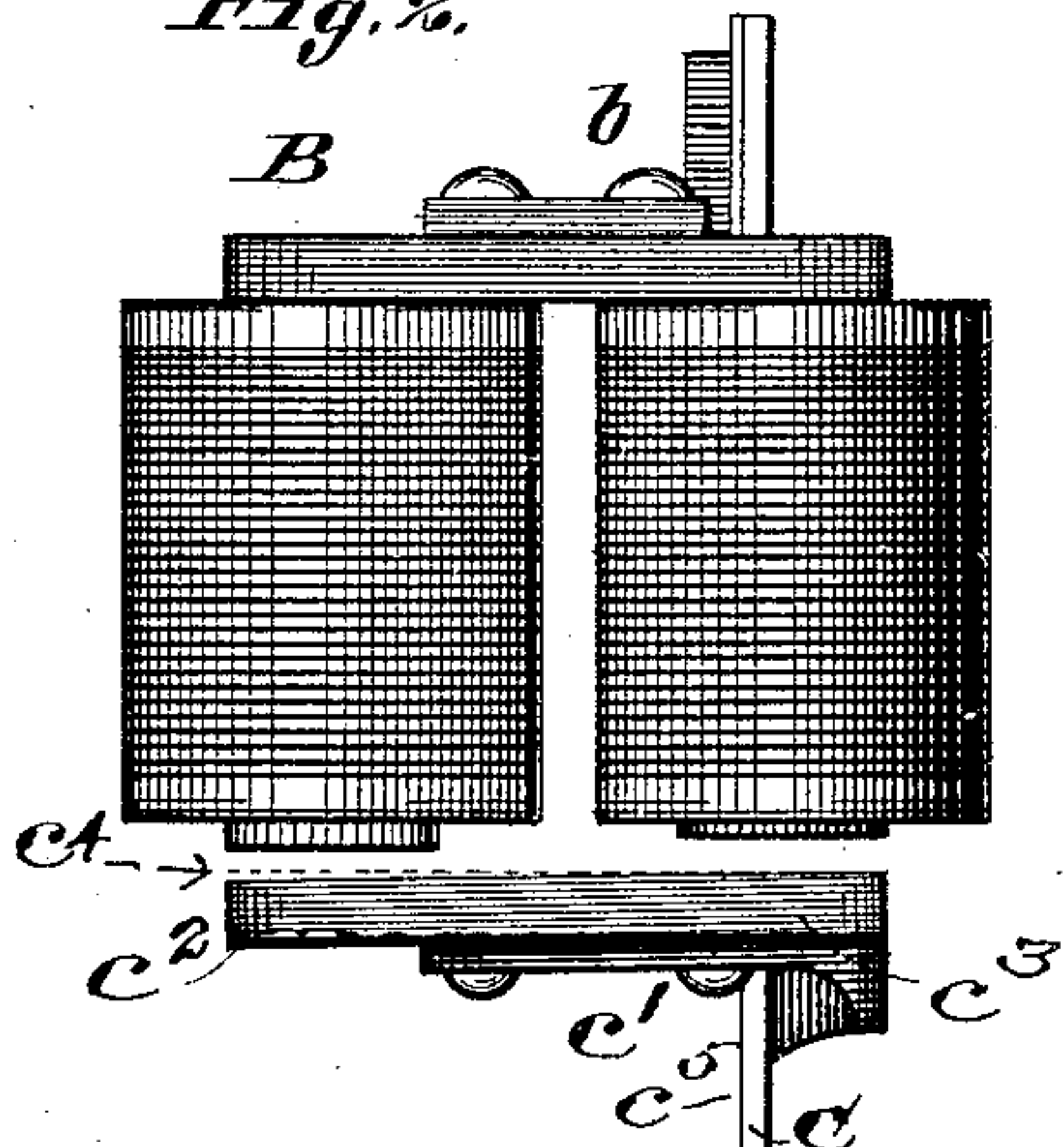


Fig. 3.

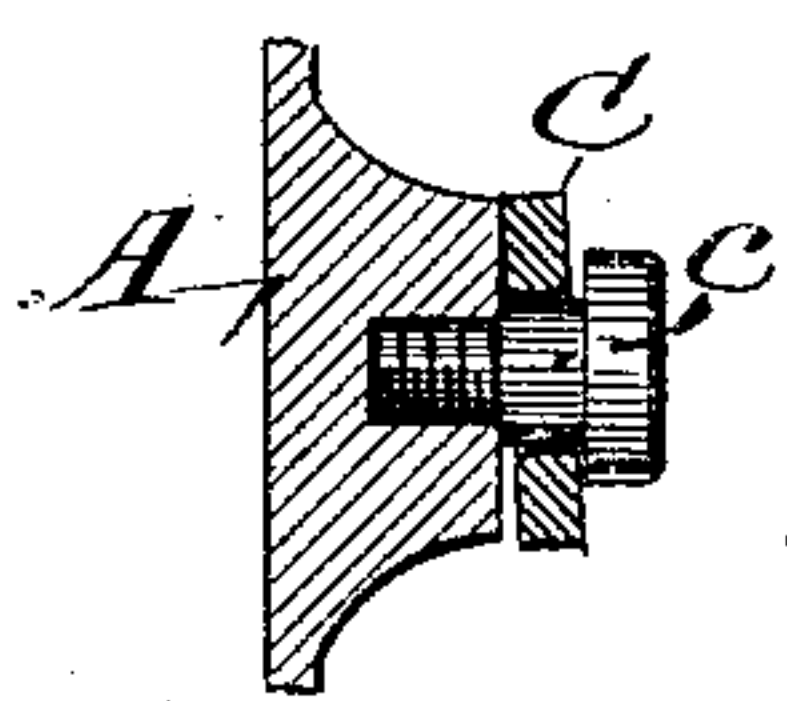


Fig. 4.

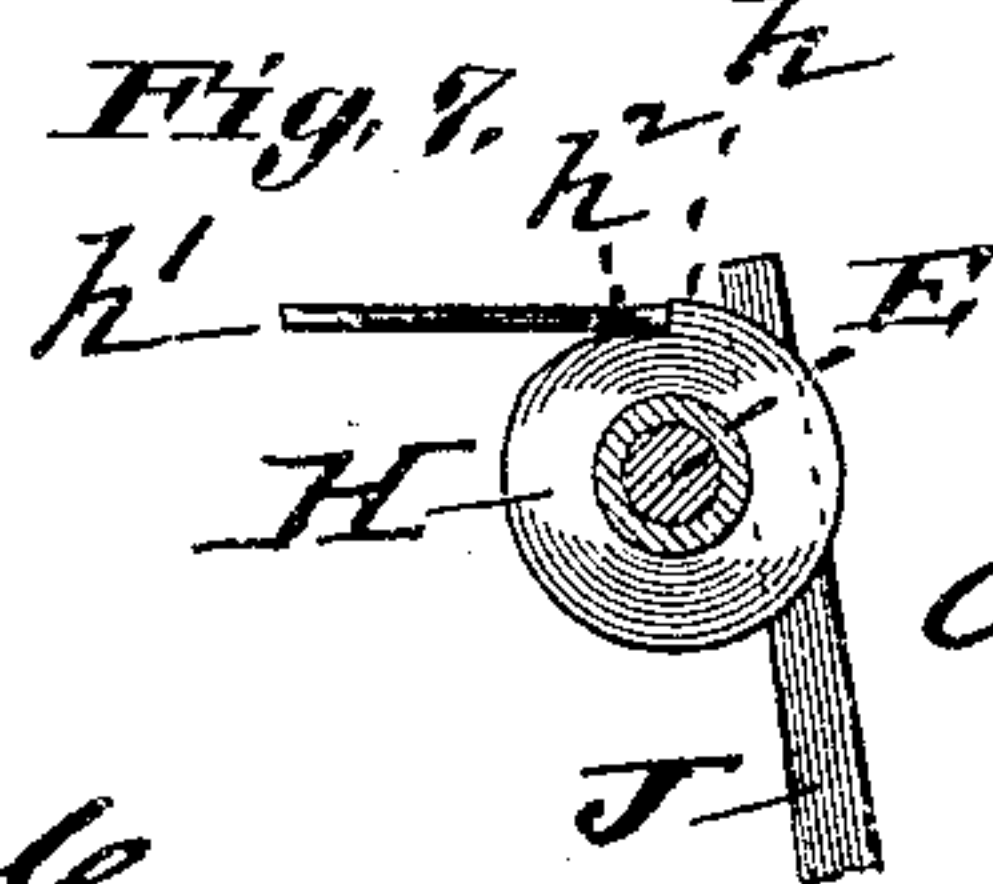
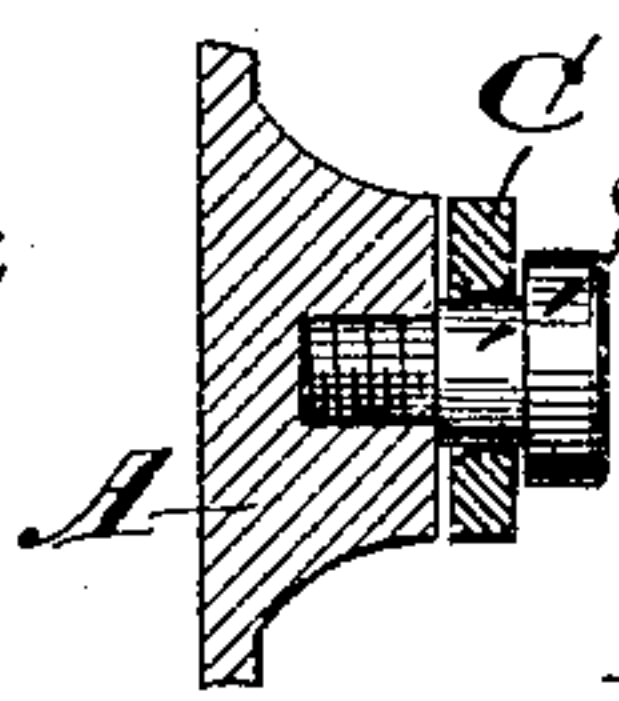
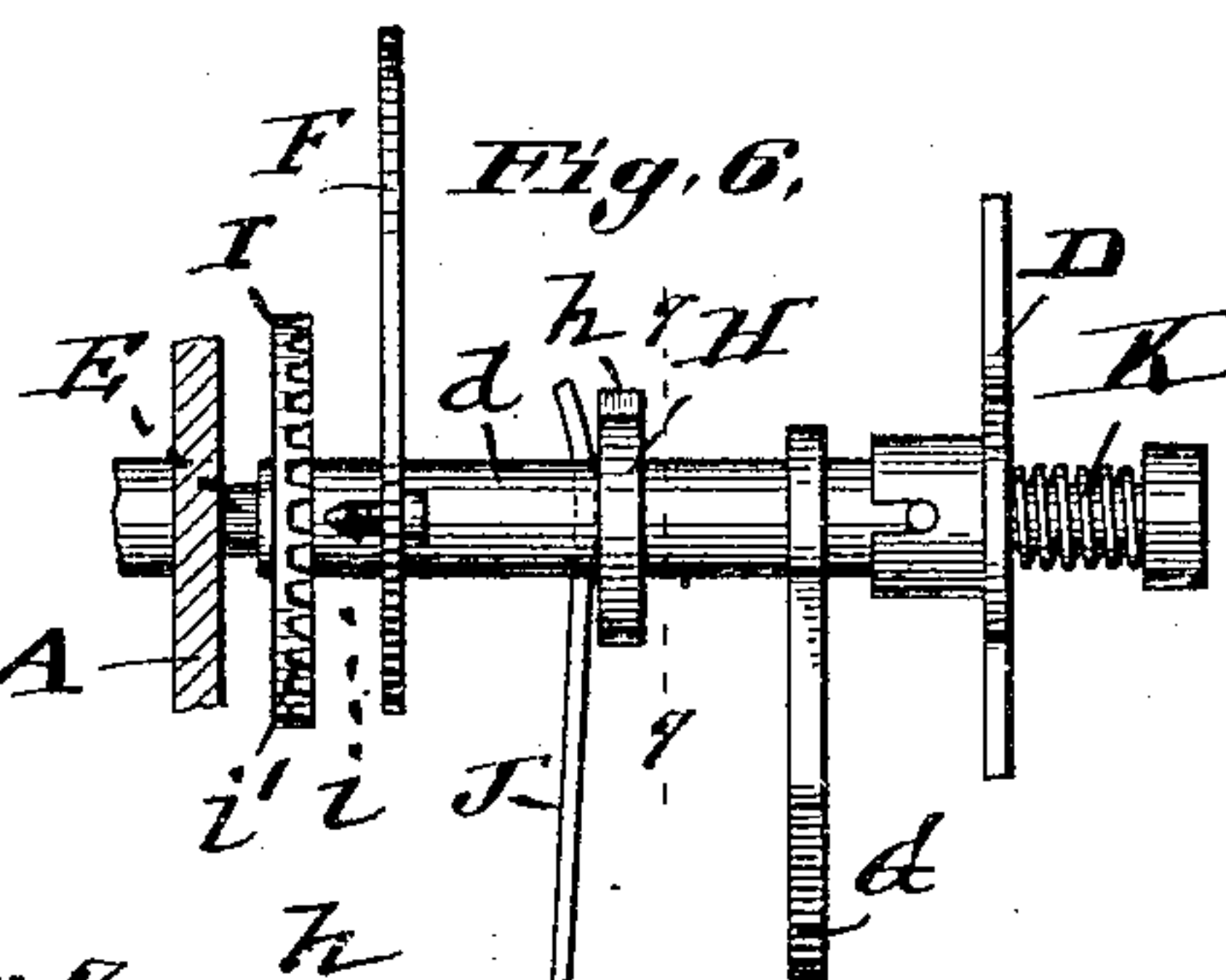


Fig. 5.

Fig. 6.



Attest;

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# UNITED STATES PATENT OFFICE.

ARTHUR G. WISEMAN, OF WEBSTER GROVES, MISSOURI.

## CLOCK-SYNCHRONIZER.

SPECIFICATION forming part of Letters Patent No. 452,299, dated May 12, 1891.

Application filed December 17, 1890. Serial No. 375,033. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR G. WISEMAN, of Webster Groves, county of St. Louis, Missouri, have made a new and useful Improvement in Clock-Synchronizers and other Mechanisms, of which the following is a full, clear, and exact description.

The leading feature of the improvement is a lever actuated by means of a magnet, said lever, when acted upon by the magnet, having a compound movement, it being vibrated upon its fulcrum and at the same time tilted sidewise thereon. In the present instance the lever referred to is employed to effect the synchronization of the seconds-hand of a clock, in which operation it is desirable, first, to unlock the seconds-hand by slipping it sidewise on its shaft, and then to rotate it upon its shaft; but I desire not to be restricted to this application solely of the improvement, as a lever moved as described may be utilized in operating the minute-hand also of the clock, and, further, the movement can be adapted for various other purposes in other various mechanisms.

A desirable application of the improvement is exhibited in the annexed drawings, making part of this specification, in which—

Figure 1 is a front elevation exhibiting an arrangement for accomplishing the synchronization of the seconds-hand of a clock; only that portion of the clock which is needed for an understanding of the improvement is exhibited; Fig. 2, an elevation of the magnet and lever at right angles to that of Fig. 1; Figs. 3 and 4, sections on the same line 3 4 of Fig. 1, and respectively showing the sidewise adjustments of the magnet-actuated lever; Fig. 5, an elevation at right angles to that of Fig. 1 of the seconds-hand mechanisms, the parts being as when the seconds-hand is locked to its shaft; Fig. 6, a view similar to that of Fig. 5, but showing the seconds-hand unlocked; and Fig. 7, a section on the line 7 7 of Fig. 6.

The same letters of reference denote the same parts.

A represents a clock-frame.

B represents an ordinary magnet adapted to be excited in the ordinary manner. The means for such excitation are not shown, being of a familiar character. The magnet can

be of any desirable shape for the purpose in question. In the present case it is shown supported in position by means of an arm *b*, connected with the clock-frame.

C represents a lever. It is pivoted at *c* and it is of an ordinary shape, saving that opposite the magnet it is provided with or is shaped to form a lateral extension *c'*, which constitutes the part which is immediately acted upon by the magnet—that is, the lever and its pivot are arranged in a plane at or toward one side of the center of the face of the magnet and the lever-extension extends across the magnet-face. Thus constructed and arranged with relation to the magnet, the lever, when subjected to the influence of the magnet, is moved in two ways: It is tilted sidewise on its pivot *c*, and it is also vibrated vertically on its pivot. The first-named movement is due to the fact that the outer end or portion *c<sup>2</sup>* of the lever-extension *c'* is farther from the pivot *c* than is the inner end or portion *c<sup>3</sup>* of the lever-extension, and the movement is illustrated in Figs. 2, 3, and 4, the broken line *c<sup>4</sup>* in Fig. 2 indicating the movement of the lever-extension as it is drawn by the magnet, and the two positions of the lever being shown in Figs. 3 and 4, respectively. The last-named movement is due, also, to the magnet, which draws not only the lever-extension *c'*, but also all that portion *c<sup>5</sup>* of the lever which is at the left, as represented in Fig. 1, of the pivot *c* generally toward the magnet, and the movement is indicated substantially by the two positions of the lever shown respectively in the full and in the broken lines of Fig. 1. This compound movement in the present application of the improvement is utilized as follows:

D represents the ordinary seconds-hand of a clock.

E represents a seconds-hand shaft. It is desirable in clock-synchronizing mechanisms for the seconds-hand to be positively secured to its shaft, saving at the times when its synchronizations are effected, and at such times to be capable of being turned freely upon its shaft. In the present construction the seconds-hand is thus connected with its shaft. The seconds-hand is secured, so as to rotate as one part therewith, to a sleeve *d*, which encircles the shaft E. The sleeve carries the



spiral arm F, an arm G, used to counterbalance the spiral arm F, and a shoulder H, which in the present instance is arranged between the spiral arm and the counter-balance, and is used for purposes presently described.

I represents a circular rack secured to the seconds-hand shaft to rotate therewith always. Some part, the spiral arm F preferably, of the sleeve *d* is provided with a tooth *i*, which is adapted to coact with the rack I, and so that when the tooth is in engagement with the teeth *i'* of the rack the sleeve, and with it the seconds-hand, become interlocked with the rack, and the seconds-hand is so held upon its shaft as to be carried around evenly therewith in the rotation of the shaft; but so that, on the other hand, when the tooth *i* is disengaged from the rack I the seconds-hand, the sleeve, and the parts attached to the sleeve, as described, are free to be turned around upon the shaft independently of the rotation of the shaft.

J represents an arm attached at *j* to the lever C. Its function is to transmit the described tilting motion of the lever C to the seconds-hand sleeve. To this end the said arm extends from the lever C to come sidewise against the shoulder H upon the sleeve, and when the lever C is tilted sidewise upon its pivot *c*, as described, the arm J is thereby vibrated sidewise, as indicated, substantially by the two positions of the said arm. (Shown respectively in Figs. 5 and 6.) This vibration in turn causes the sleeve *d* to be shifted upon the seconds-hand shaft from its position of Fig. 5 into its position of Fig. 6, and the sleeve is thereby disengaged from the rack I, and the seconds-hand and the parts therewith turning are free to be rotated upon the seconds-hand shaft. When the arm J ceases to exert the described sidewise pressure upon the sleeve-shoulder a spring K, acts to thrust the sleeve in the opposite direction upon the seconds-hand shaft and to cause the tooth *i* to again engage with the rack I.

L represents the striker, which is adapted to coact with the spiral arm F to effect the rotation of the seconds-hand upon its shaft. The striker is pivoted at *l* to the clock-frame, and it is provided with a pin *l'*, which engages in a slot *l''* in the lever C. When the magnet acts upon the lever C to cause it to vibrate

vertically, as indicated by the broken lines in Fig. 1, the striker is turned upon its pivot and the spiral arm, carrying the sleeve with it, is turned around upon the seconds-hand shaft, as suggested by its different positions shown in Fig. 1. To prevent the sleeve *d* from turning backward the shoulder H is provided with an offset *h*, with which a spring-arm *h'* coacts in the rotation of the sleeve. The free end *h''* of the spring-arm falls behind the offset *h*, and the sleeve is thereby held from rotating backward.

It should be stated that the lever and its pivots *c* are relatively constructed to provide for the described compound movement of the lever.

I claim--

1. The combination of a magnet and an armature, said armature being attached to a lever pivoted in a plane which is at the side of the center of the face of said magnet, and having the described compound movement.

2. The combination of the lever having the described compound movement with the adjustable seconds-hand and the arm connected with said lever and adapted to exert sidewise pressure in the adjustment of said seconds-hand, substantially as described.

3. The combination of the seconds-hand, the seconds-hand shaft, the shouldered sleeve provided with the spiral arm and tooth, the circular rack fastened to said shaft, the spring, the lever having the compound movement, and the arm attached to said lever and adapted when said lever is tilted to exert a sidewise pressure, substantially as described.

4. The combination of the magnet, the lever provided with the lateral extension and having the described compound movement, the seconds-hand and its shaft, the circular rack fastened to said shaft, the shouldered sleeve adjustable on said shaft and provided with the spiral arm and tooth, the spring, the striker, and the arm leading from said lever and adapted to exert the sidewise pressure to unlock said sleeve, substantially as described.

Witness my hand this 15th day of December, 1890.

ARTHUR G. WISEMAN.

Witnesses:

C. D. MOODY,  
A. BONVILLE.