

(No Model.)

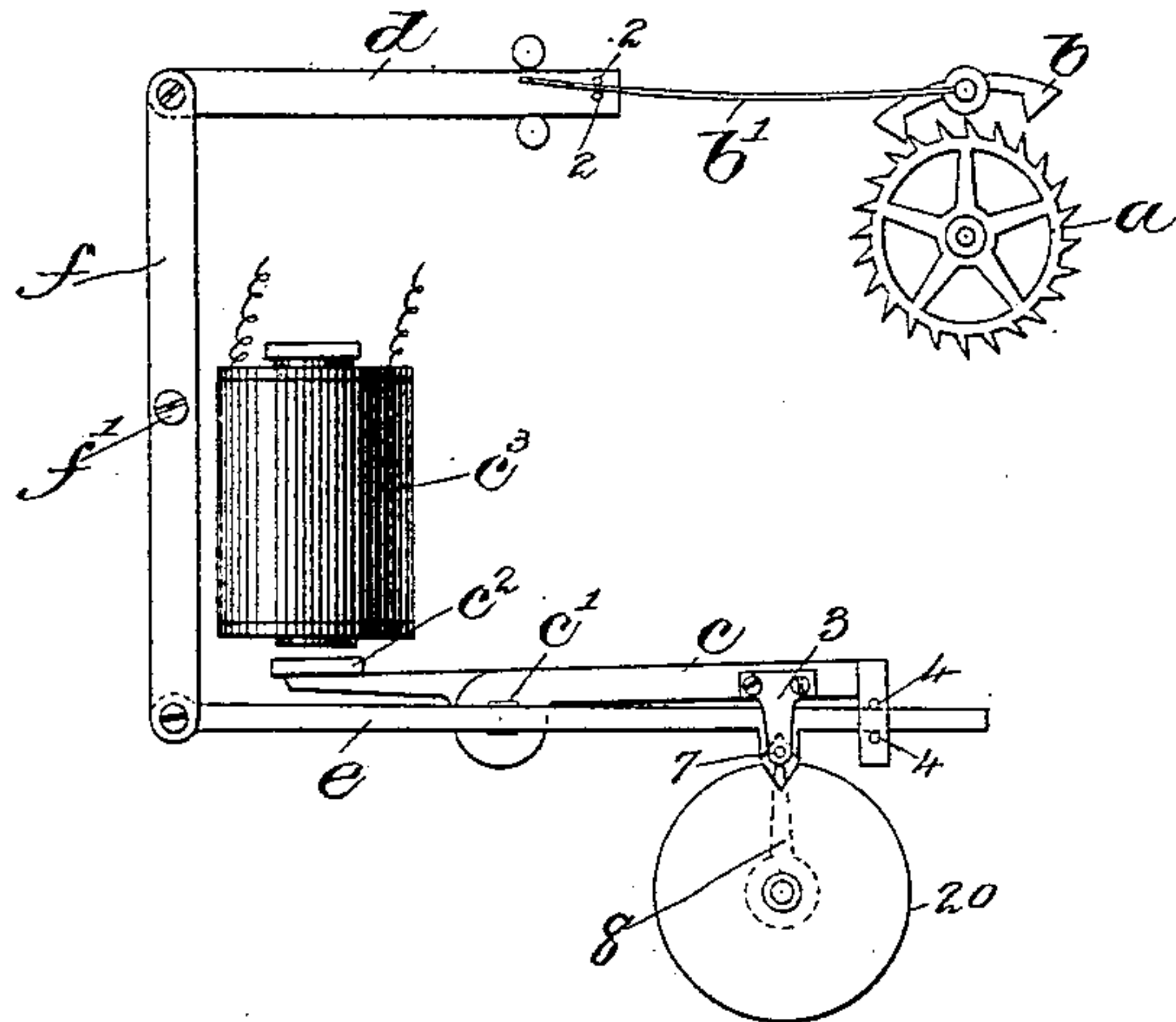
W. S. SCALES.

CONTROLLING DEVICE FOR THE REGULATING MEMBERS OF CLOCKS.

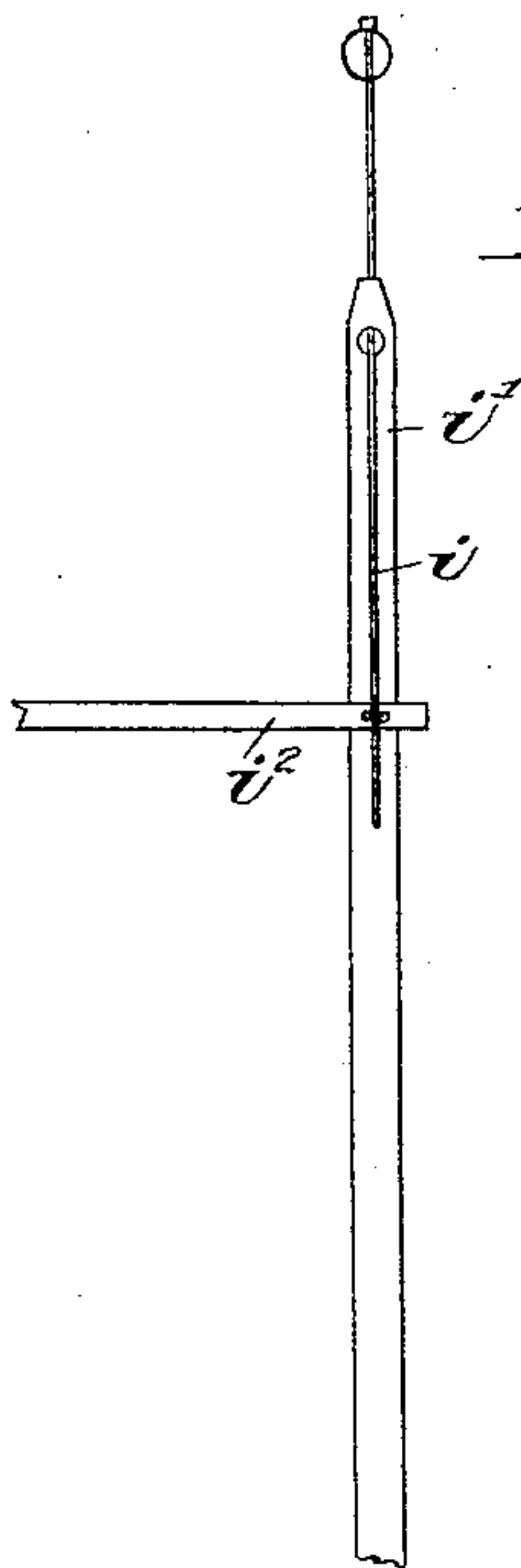
No. 395,357.

Patented Jan. 1, 1889.

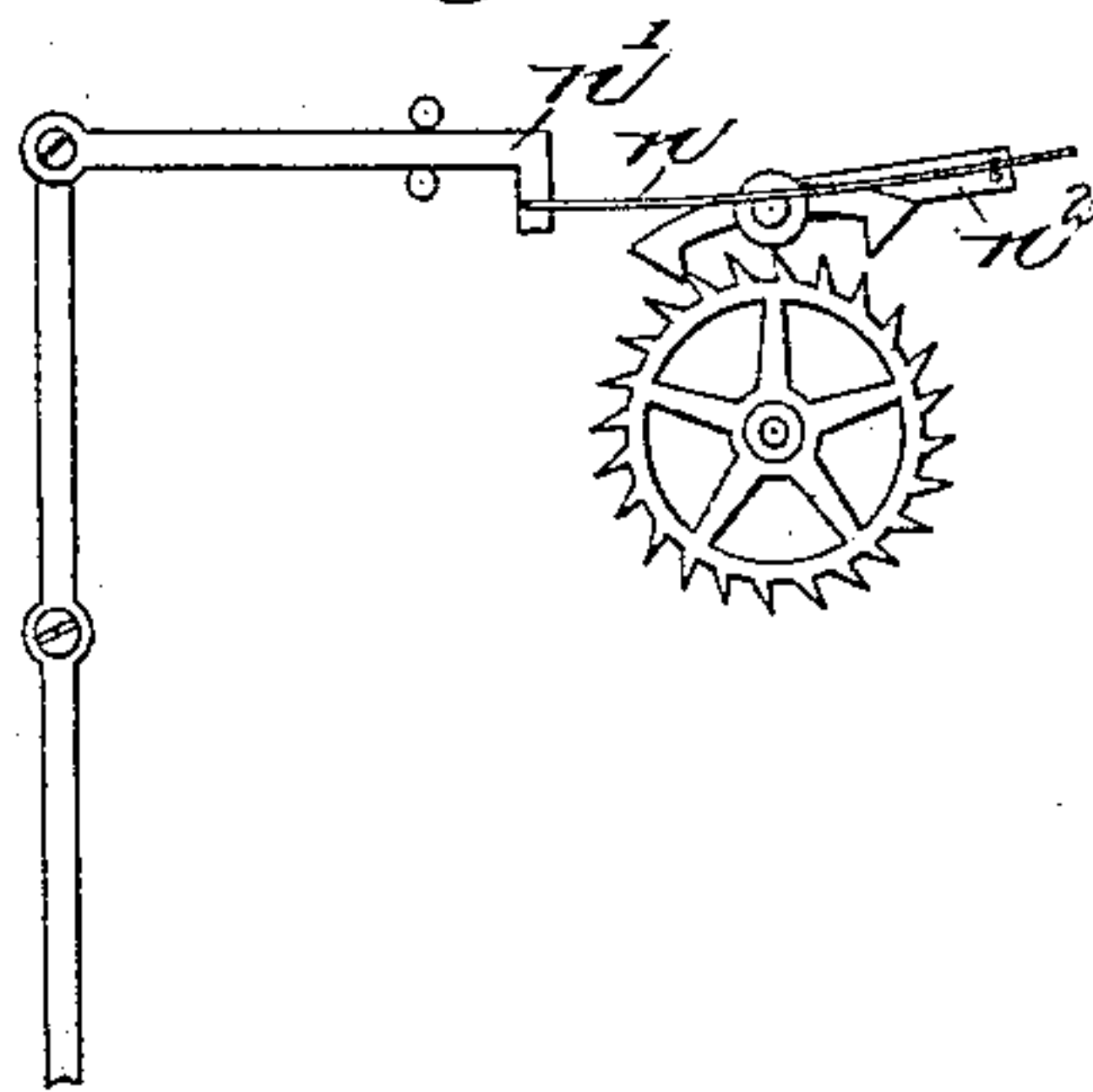
*Fig: 1.*



*Fig: 2.*



*Fig: 3.*



Witnesses.

*Frederick Emery*

*Frederick S. Chubb*

Inventor.

*William S. Scales*

*by Leroy Gregory*  
*attys.*

# UNITED STATES PATENT OFFICE.

WILLIAM S. SCALES, OF SOMERVILLE, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO ROYAL E. ROBBINS, OF BOSTON, MASSACHUSETTS.

## CONTROLLING DEVICE FOR THE REGULATING MEMBERS OF CLOCKS.

SPECIFICATION forming part of Letters Patent No. 395,357, dated January 1, 1889.

Application filed March 17, 1888. Serial No. 267,457. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM S. SCALES, of Somerville, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Controlling Devices for the Regulating Members of Clocks, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide means for regulating clocks from a distance, whereby the regulating members of one or several secondary clocks may be so controlled or governed that the clocks shall be made to gain or lose, as necessity requires, to correspond with the master-clock.

In accordance with this invention, it is designed that the regulating members during each movement shall overcome a suitable resistance, and that this resistance shall be variable and controllable from a distance, as from the master-clock. As a preferable way to carry out my present invention, a flat spring or spring-like strip is attached at one end of the verge of the escapement or to the pendulum-rod, and the outer or free end of the said spring is held by an operating lever or bar controlled, directly or indirectly, by an electro-magnet which is effected by changes in a circuit caused by the master-clock. Any movement of the operating bar or lever lengthens or shortens the spring, so as to increase or decrease its reacting force or to vary the resistant of the regulating member. The spring may be attached to the operating-bar and its end be held by a bar or lever rigidly attached to the verge or pendulum or to the pendulum direct.

Figure 1 shows the escapement of an ordinary clock and means for varying the resistance of the verge in accordance with this invention. Fig. 2 is a detail showing the variable resistance connected with the pointer, and Fig. 3 is a modification to be referred to.

Referring to Fig. 1, the escape-wheel *a* and the verge *b* are as now common in ordinary clocks. The resistant shown in Fig. 1 consists of a flat spring, *b'*, or a spring-acting strip, one end of which is attached to the verge *b*, while its other or free end is held loosely be-

tween two pins, 2, attached to or projecting from the operating bar or lever *d*, pivoted to the upper end of a lever, *f*, the said operating bar or lever *d* being moved horizontally or longitudinally in one or the other direction by the lever *e*. As the operating bar or lever *d* is thus moved horizontally or longitudinally, the spring *c* is lengthened or shortened. The lever *f* is pivoted at or near its center, as at *f'*, and has loosely connected with it at its lower end a controlling-lever, *e*, having upon its under side a projection or ear, 7, provided with a V-shaped recess. The lever *e* at its outer end rests upon or between pins 4, attached to the lever *c*, pivoted at *c'*, the outer end of said lever *c* carrying the armature *c<sup>2</sup>* of the electro-magnet *c<sup>3</sup>*. The lever *c* also has an ear, 3, provided with a pin which enters the V-shaped notch in the disk 20. An arm, 8, is fixed to the shaft, upon which the disk 20 is mounted, which co-operates with the V-shaped ear 7 of the lever *e*.

The levers *e* and *c* and the co-operating parts are the same as shown in application for United States Patent, Serial No. 255,484, filed by me November 18, 1887, and indicated by like letters, to which reference may be had.

It will be seen that as the verge *b* is moved the spring *b'* is bent first in one and then in the opposite direction, and when the verge is at an intermediate point the spring offers no resistance; but as the spring is bent in one or the other direction by the movement of the verge the resistance gradually increases.

As the lever *d* is moved in one or the other direction longitudinally, the spring is lengthened or shortened, and hence the resistance varies. I herein term the resistant a "variable" resistant, meaning one in which the resistance gradually increases as the verge moves in one or the other direction, and not to the variations given to the resistance by the longitudinally-moving rod *d*, such movement increasing or decreasing the amount of variations.

In Fig. 2, I have also shown the resistant as a flat spring, *i*, attached at one end to the pendulum *i'*, its outer or free end being held by an operating bar or lever, *i<sup>2</sup>*, adapted to be moved to lengthen or shorten the spring.

In Fig. 3, I have also shown a flat spring, *n*, as a resistant, it being attached at one end to



the longitudinally-operating bar or lever,  $n'$ , and its outer or free end being held by a lever or arm,  $n^2$ , fixed to the verge of the escapement.

5 In the instances shown in Figs. 2 and 3 a similar result is accomplished as by the device shown in Fig. 1.

I claim—

10 1. The combination, with the escapement  $a$  and verge  $b$ , of a resisting-spring for the verge, the operating bar or lever for varying the force or resistance of said spring, and an electro-magnet for moving or controlling the movement of said operating bar or lever, sub-

15 stantially as described.

2. The combination, with the regulating or

controlling member of a clock, of a spring operatively connected with said member and the operating bar or lever for increasing or decreasing the force or amount of the resist- 20  
ance of said spring, and an electro-magnet for moving or controlling the movement of said operating bar or lever, substantially as described.

In testimony whereof I have signed my 25  
name to this specification in the presence of two subscribing witnesses.

WILLIAM S. SCALES.

Witnesses:

G. W. GREGORY,

F. L. EMERY.