No. 820,187. PATENTED MAY 8, 1906.

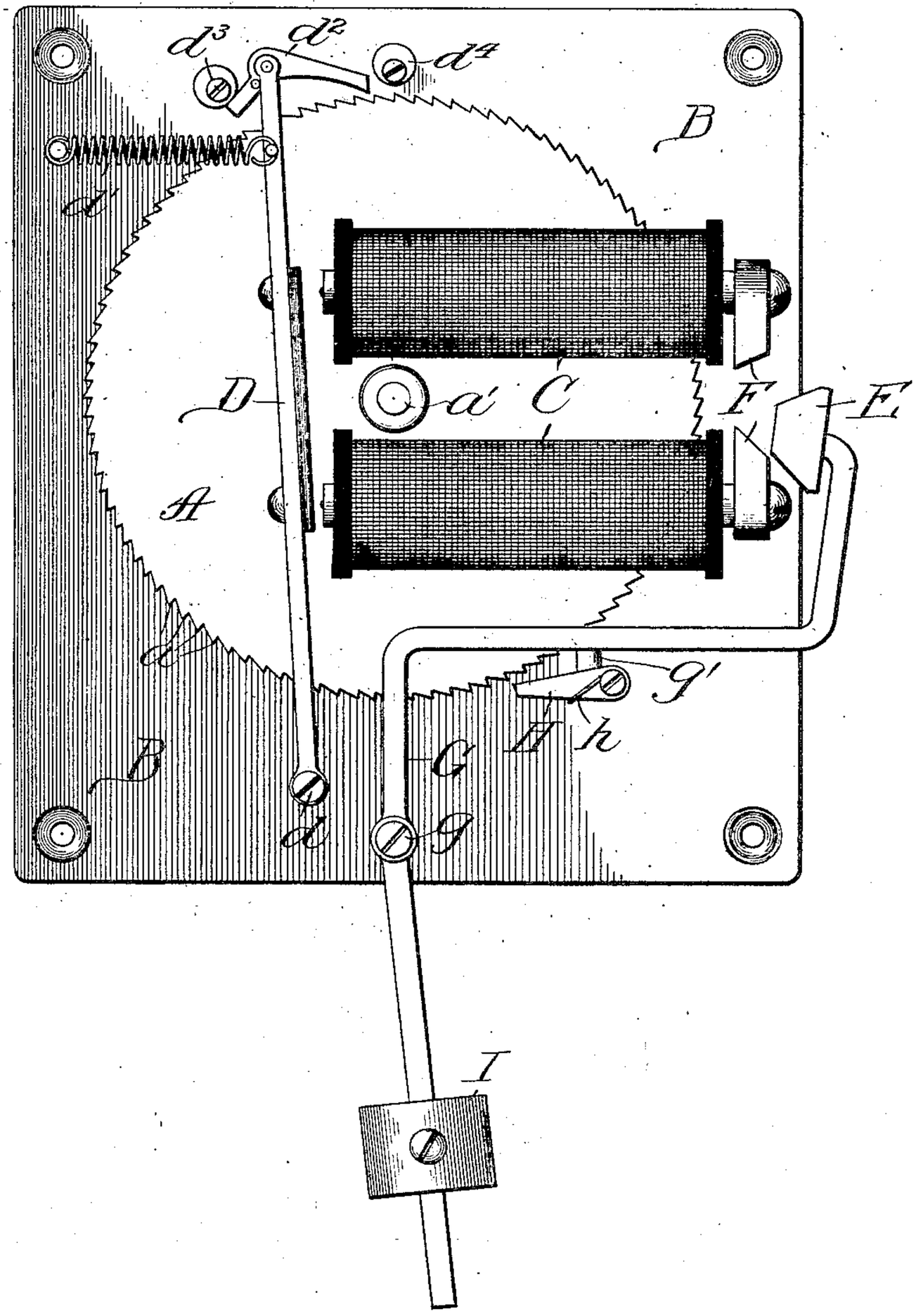
C. D. ENOCHS.

AUTOMATIC EXCHANGE SELECTOR.

APPLICATION FILED OCT. 16, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig 2.

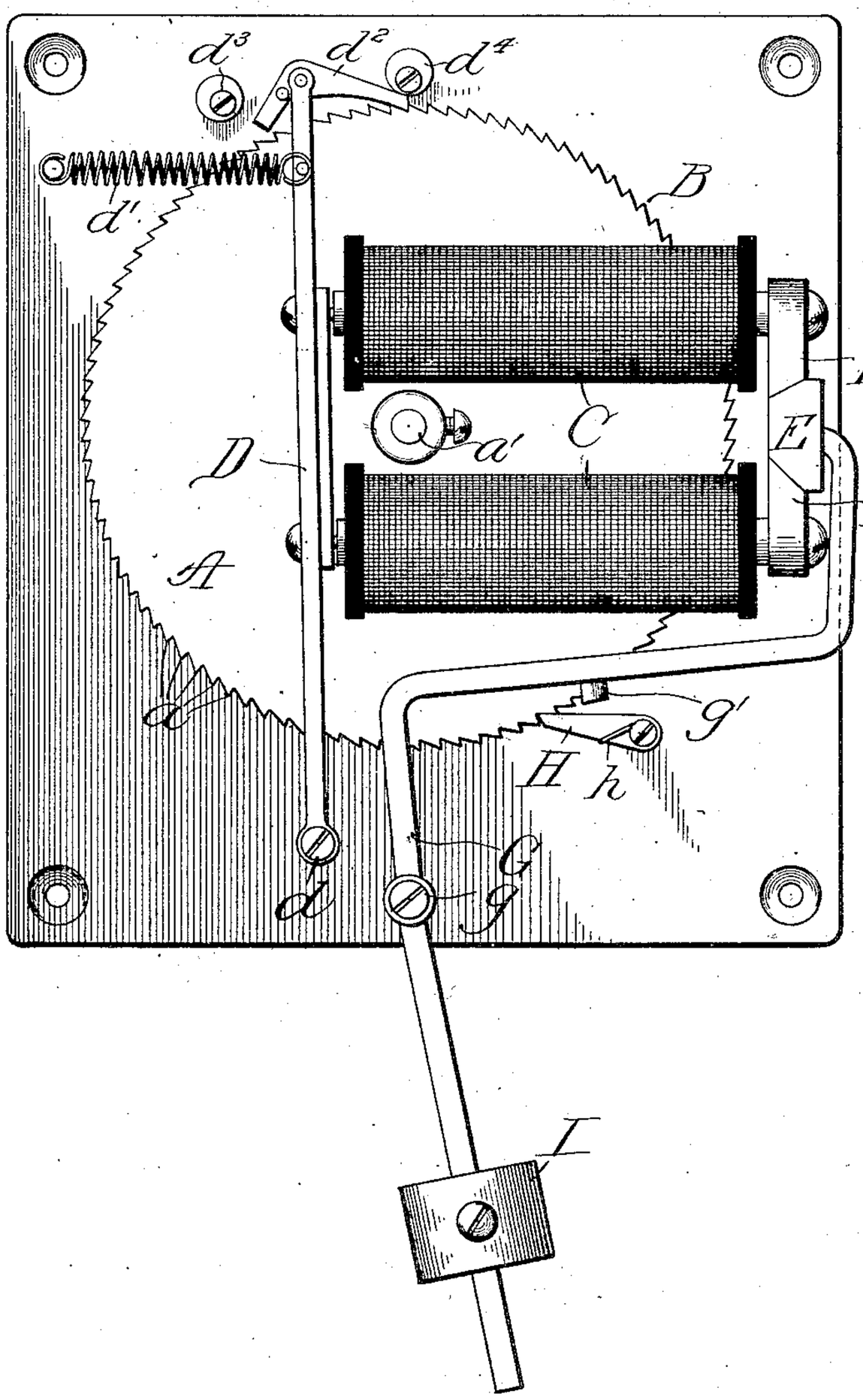
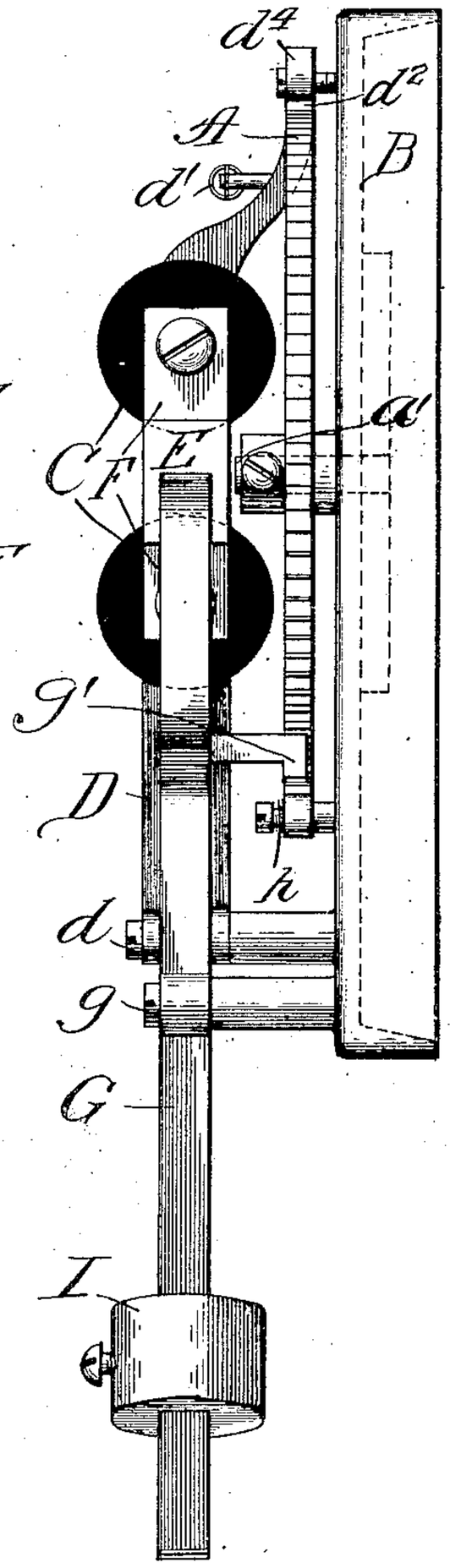


Fig 3.



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UNITED STATES PATENT OFFICE.

CLAUDE D. ENOCHS, OF LA CROSSE, WISCONSIN, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC EXCHANGE-SELECTOR.

No. 820,187. Specification of Letters Patent. Patented May 8, 1906.

Application filed October 16, 1905. Serial No. 282,985.

To all whom it may concern:

Be it known that I, CLAUDE D. ENOCHS, a citizen of the United States, residing at La Crosse, in the county of La Crosse and State of Wisconsin, have invented a certain new and useful Improvement in Automatic Exchange-Selectors, of which the following is a full, clear, concise, and exact description.

My invention relates to a selector for automatic telephone-exchanges, and has for its object the simplification of the mechanism for effecting the interconnection of the different lines terminating at the central exchange.

My invention provides a selecting mechanism in which but one magnet is used. This magnet is provided with two armatures, one carrying the stepping-pawl and the other controlling the retaining-pawl. The former is arranged to respond to each interruption of the current through the magnet, so that the stepping-pawl is actuated once for each impulse of current through the magnet, while the other armature is constructed so as to respond only to interruptions of longer duration and to remain attracted during the process of selection as well as when the current is constant. I am thus enabled to dispense with the usual retaining-magnet, and thereby to simplify the selector mechanism.

I will describe my invention in detail by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of the selector with the parts in normal position, the selector-arm carrying the terminals of the calling-line and the terminal contacts of the other lines being omitted for the sake of clearness. Fig. 2 is a view similar to that of Fig. 1, showing the position of the parts when the selector is being actuated. Fig. 3 is a side elevation of the selector.

The same letters of reference are used to indicate the same parts wherever they are shown.

A is the ratchet-wheel of the selector, rotatably mounted on its axis a', secured to the supporting-frame B. It will be understood that the usual selector-arm, which rotates with the ratchet-wheel A, is provided. Said arm, the line-terminals over which it trails, and the spring for returning the ratchet-wheel to normal position may be of the usual construction, and since they form no part of my invention it is deemed unnecessary to illustrate or describe them.

When a calling subscriber operates his calling mechanism in the usual manner to send a series of impulses through the magnet C, said magnet attracts its armature D, which is pivoted at d to the supporting-frame, and said armature is drawn forward against the tension of the spring d', as shown in Fig. 2. Pivoted at the upper end of the armature D is a pawl d^2 in the shape of a bell-crank lever, which when the armature is in its normal position is held out of engagement with the teeth a of the ratchet-wheel by the pin d^3. When the armature is drawn forward, the pawl is freed from the pin d^3 and contacts with the pin d^4 and is thereby forced into engagement with the teeth a, so that each time the armature D is attracted the wheel A is advanced one step.

E is an armature for controlling the operation of the retaining-pawl H. Said armature is mounted on one end of a lever G, pivoted at g to the frame B. The other end of said lever is provided with a weight I. When the lever G is in its normal position shown in Fig. 1, a projection g' thereon engages with the pawl H and holds said pawl against the tension of the spring h out of engagement with the teeth a. When the magnet C is energized, the armature E is attracted and engages with the split yoke F of the magnet C, as shown in Fig. 2. The pawl H is then released from its engagement with the projection g' and is forced by the spring h into engagement with the teeth a and holds the ratchet-wheel A in its advanced position.

While the interrupted current is sent through the magnet C by the calling subscriber in the usual manner, the stepping-pawl is D actuated once for each impulse, thereby advancing the ratchet-wheel A step by step. The interruptions are of such frequency, however, that the armature E does not follow them, but remains in its attracted position. This is due to the inertia of the weight I and also to the fact that the movement of the armature E is retarded by a "freezing" iron-to-iron contact between said armature and the split yoke F. The pawl H therefore remains in engagement with the teeth a and retains the wheel in its advanced position. When, however, the magnet C is

deënergized for a sufficient perion of time, the lever G, by the force of gravity, swings back to its normal position, and in so doing the projection g' kicks the retaining-pawl H from its engagement with the teeth of the ratchet-wheel A, permitting said wheel to be returned to its normal position in the usual manner. It will be seen, therefore, that both the stepping-pawl and the retaining-pawl are actuated through the same magnet and that the usual retaining-magnet is dispensed with.

Having described my invention, I claim—

1. In a selector for an automatic telephone-exchange, the combination with a rotatably-mounted ratchet-wheel, of a stepping-pawl and a retaining-pawl for controlling the rotation of said wheel, and an electromagnet having a quick-acting armature and an armature possessing considerable inertia for controlling the operation of said pawls.

2. The combination with a rotatably-mounted ratchet-wheel, of an electromagnet, an armature for said magnet, a pawl actuated thereby for stepping said wheel, a second armature for said magnet, means whereby said second armature is caused to act sluggishly when the magnet is deënergized, and a retaining-pawl controlled by said second armature and adapted to engage the teeth of the ratchet-wheel when said armature is in its attracted position.

3. The combination with a rotatably-mounted ratchet-wheel, of an electromagnet having a divided yoke, an armature for said magnet provided with a pawl for stepping said wheel when the armature is operated, a retaining-pawl for holding said wheel in its advanced position, a second armature normally holding said retaining-pawl out of engagement with the teeth of the ratchet-wheel and adapted to engage with said divided yoke, whereby said armature is held in its attracted position while an interrupted current is sent through said magnet.

4. The combination with a rotatably-mounted ratchet-wheel, of an electromagnet having a divided yoke, an armature for said magnet provided with a pawl for stepping said wheel when the armature is attracted, a retaining-pawl for holding said wheel in its advanced position, a pivoted lever normally holding said retaining-pawl out of engagement with the teeth of the ratchet-wheel, a weight carried by said lever, and an armature carried by said lever adapted to engage with said divided yoke, whereby said lever is held out of engagement with said retaining-pawl while an interrupted current is sent through said magnet.

5. In a selector for an automatic telephone-exchange, the combination with a ratchet, of a stepping and a retaining pawl for controlling the movement of said ratchet, an electromagnet, a quick-acting armature adapted to control the movement of the stepping-pawl and a slow-acting armature adapted to control the movement of the retaining-pawl, and a weight for said slow-acting armature having its center of gravity but slightly displaced from a vertical line through its support.

6. In a selector for an automatic telephone-exchange, the combination with a ratchet, of a stepping and a retaining pawl for controlling the movement of said ratchet, an electromagnet, a quick-acting armature adapted to control the movement of the stepping-pawl and an armature adapted to control the movement of said retaining-pawl, said armature having considerable inertia.

7. In a selector for an automatic telephone-exchange, the combination with a ratchet, of a stepping and a retaining pawl for controlling the movement of said ratchet, an electromagnet, a quick-acting armature adapted to control the movement of the stepping-pawl and an armature adapted to control the movement of said retaining-pawl, said armature having considerable inertia but having slight retractive force.

In witness whereof I hereunto subscribe my name this 26th day of July, A. D. 1905.

CLAUDE D. ENOCHS.

Witnesses:

RUTH WARREN,

OLGA JENSEN.