

No. 470,373.

Patented Mar. 8, 1892.

*Fig:1.*

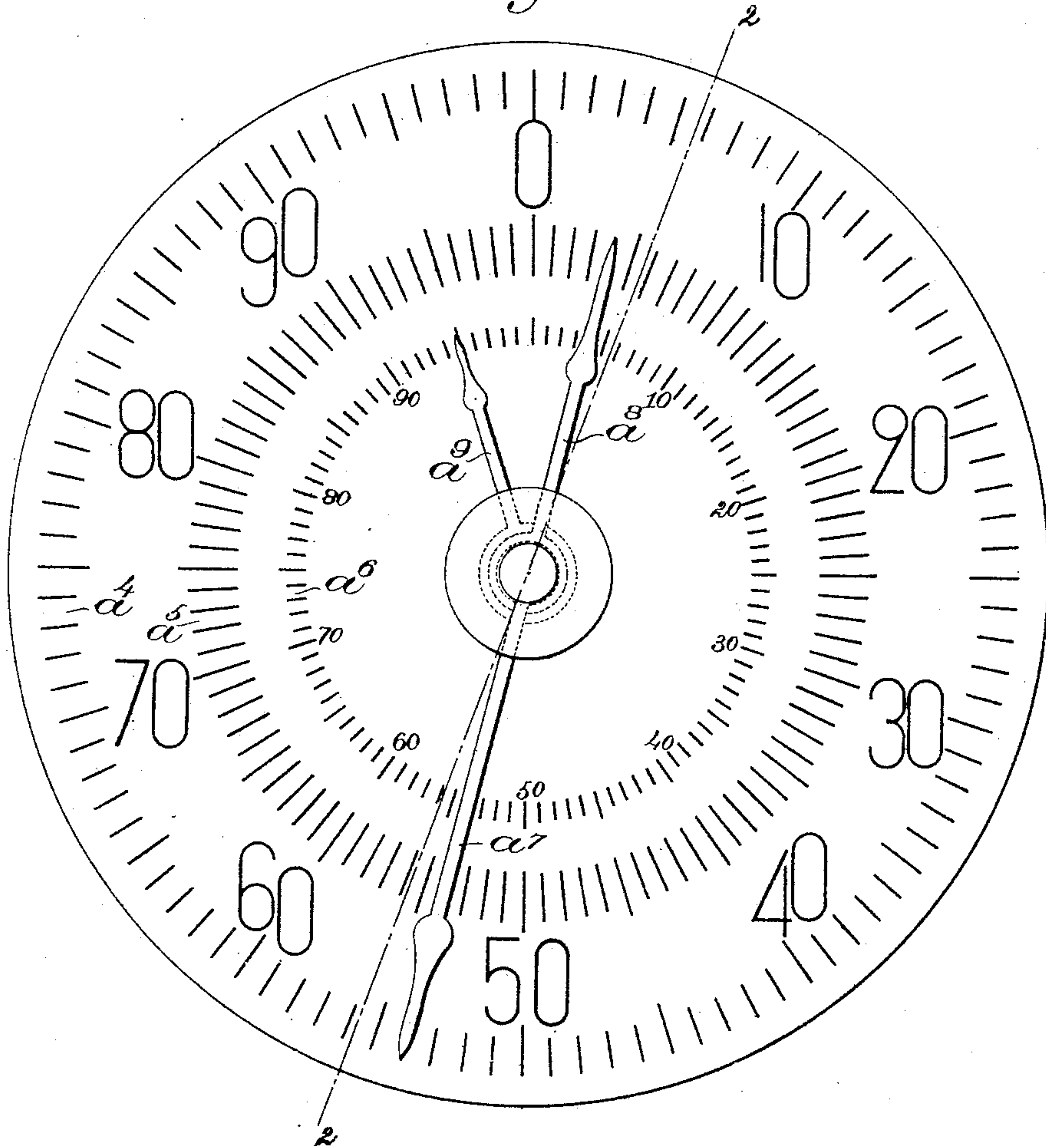
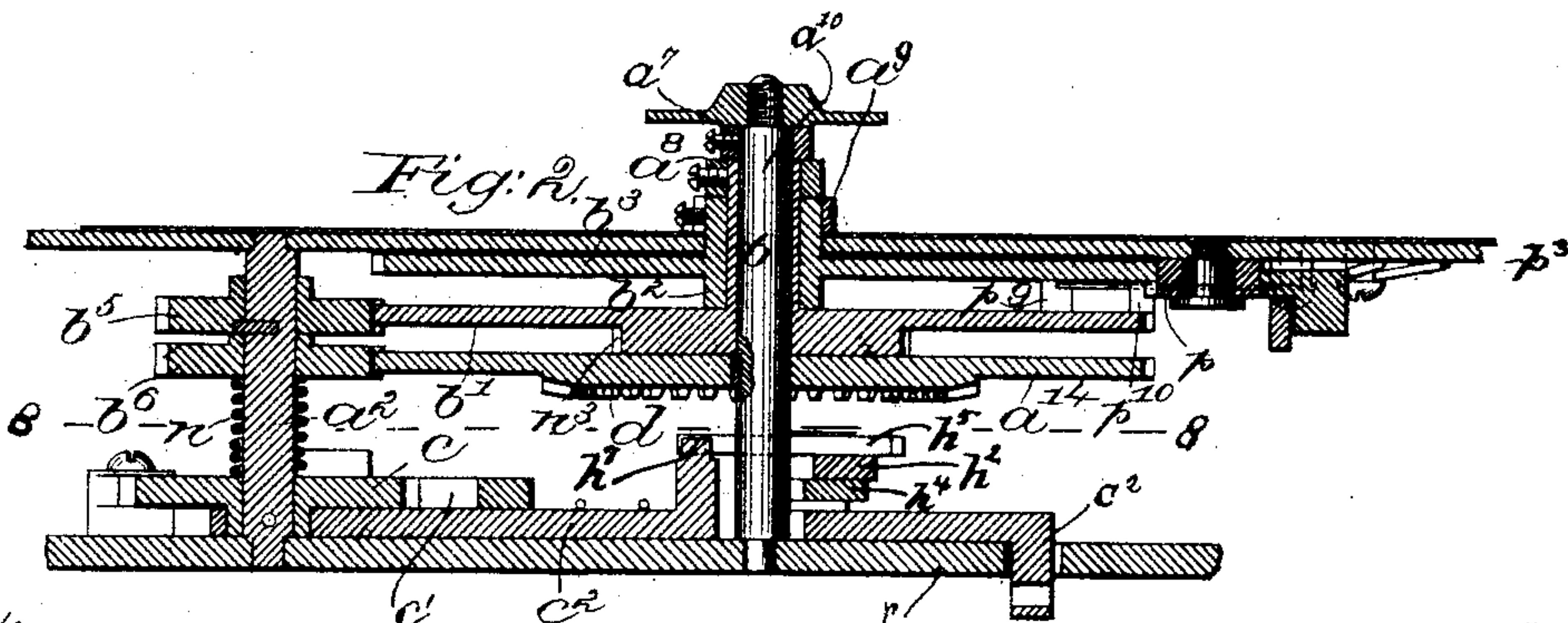


Fig: 2.



Witnesses.

Fred S. Greenleaf  
Louise N. Lowell

*Inventor:*

Louis C. De Sloovere,  
by Crosby Gregory attys.

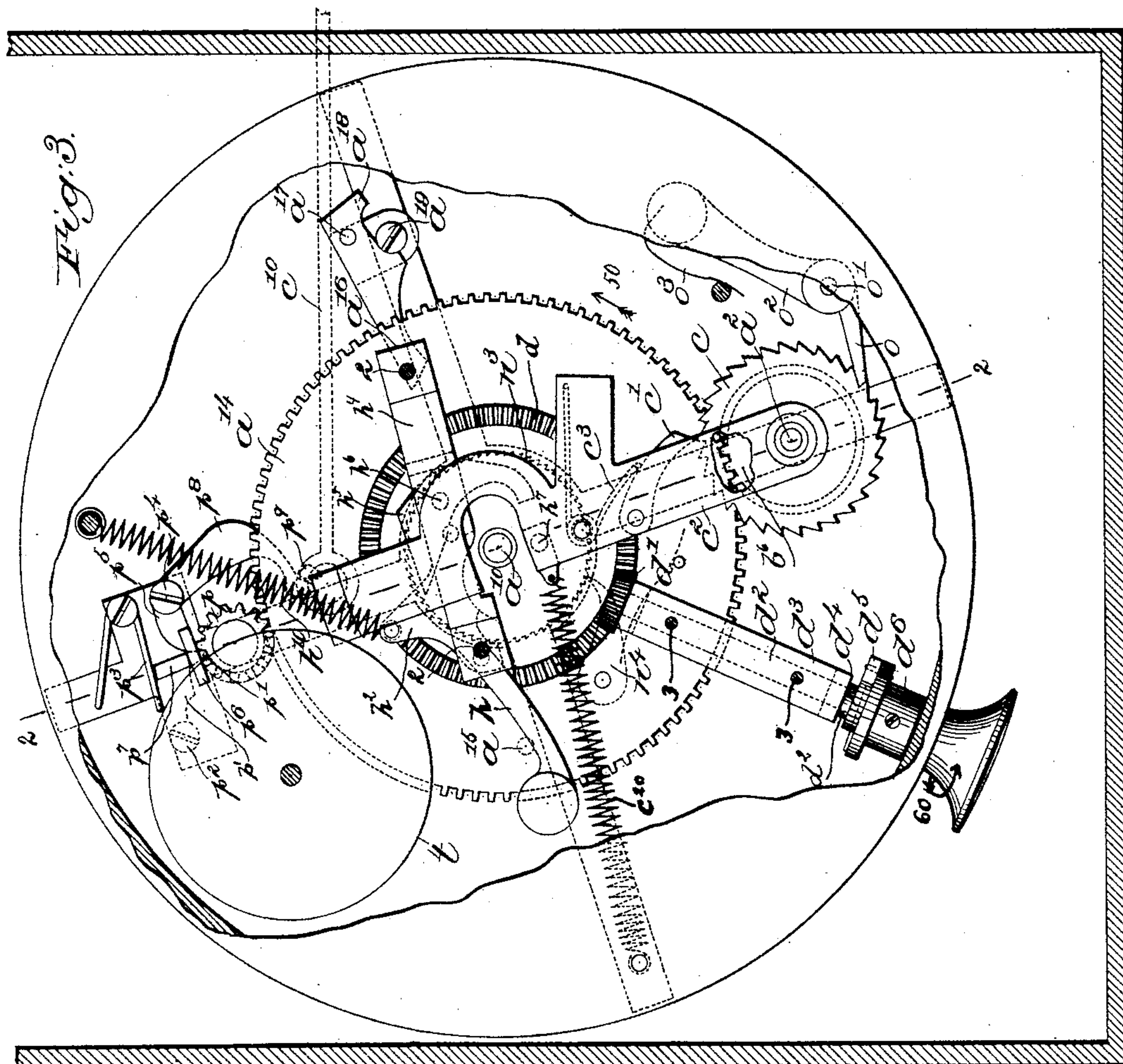
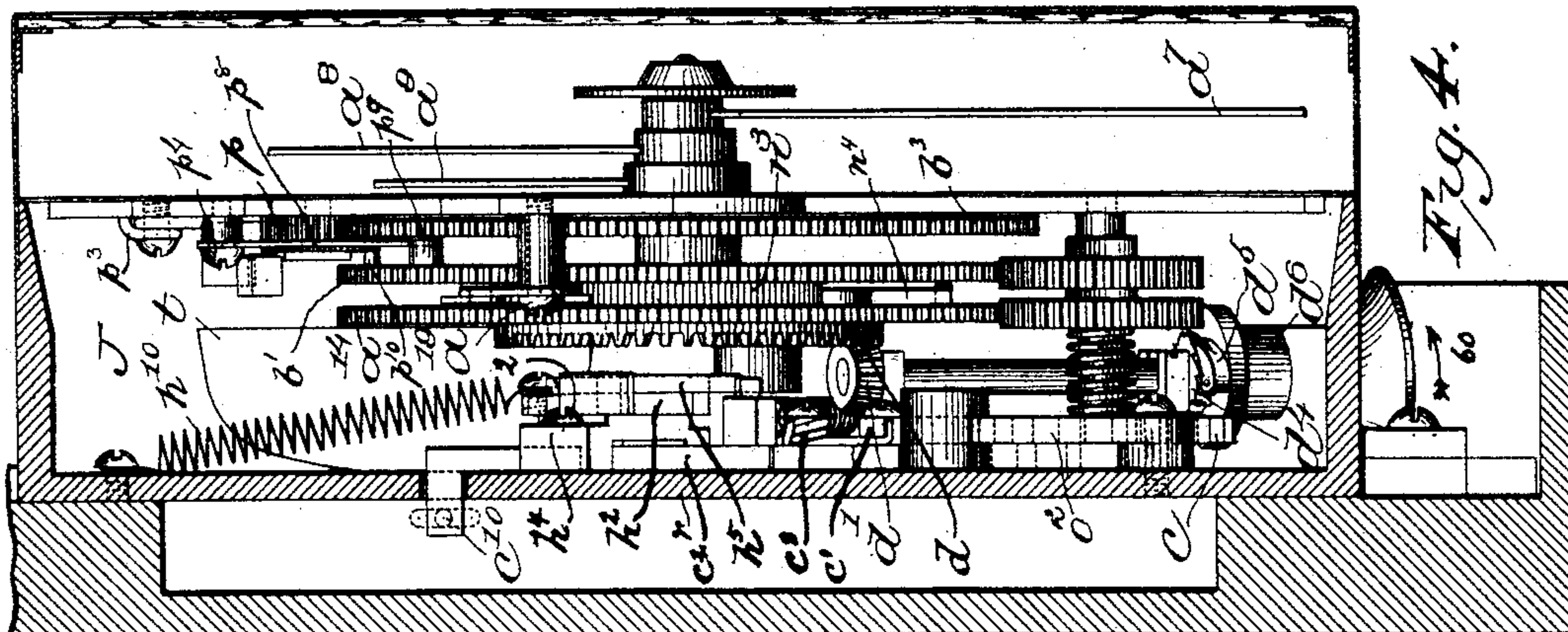
(No Model.)

3 Sheets—Sheet 2.

L. C. DE SLOOVERE.  
FARE REGISTER.

No. 470,373.

Patented Mar. 8, 1892.



Witnesses.  
Fred S. Grunhof.  
Louis N. Lowell.

Inventor.  
Louis C. De Sloovere  
by Crosby & Gregory Attys.



(No Model.)

3 Sheets—Sheet 3.

L. C. DE SLOOVERE.  
FARE REGISTER.

No. 470,373.

Patented Mar. 8, 1892.

Fig. 5.

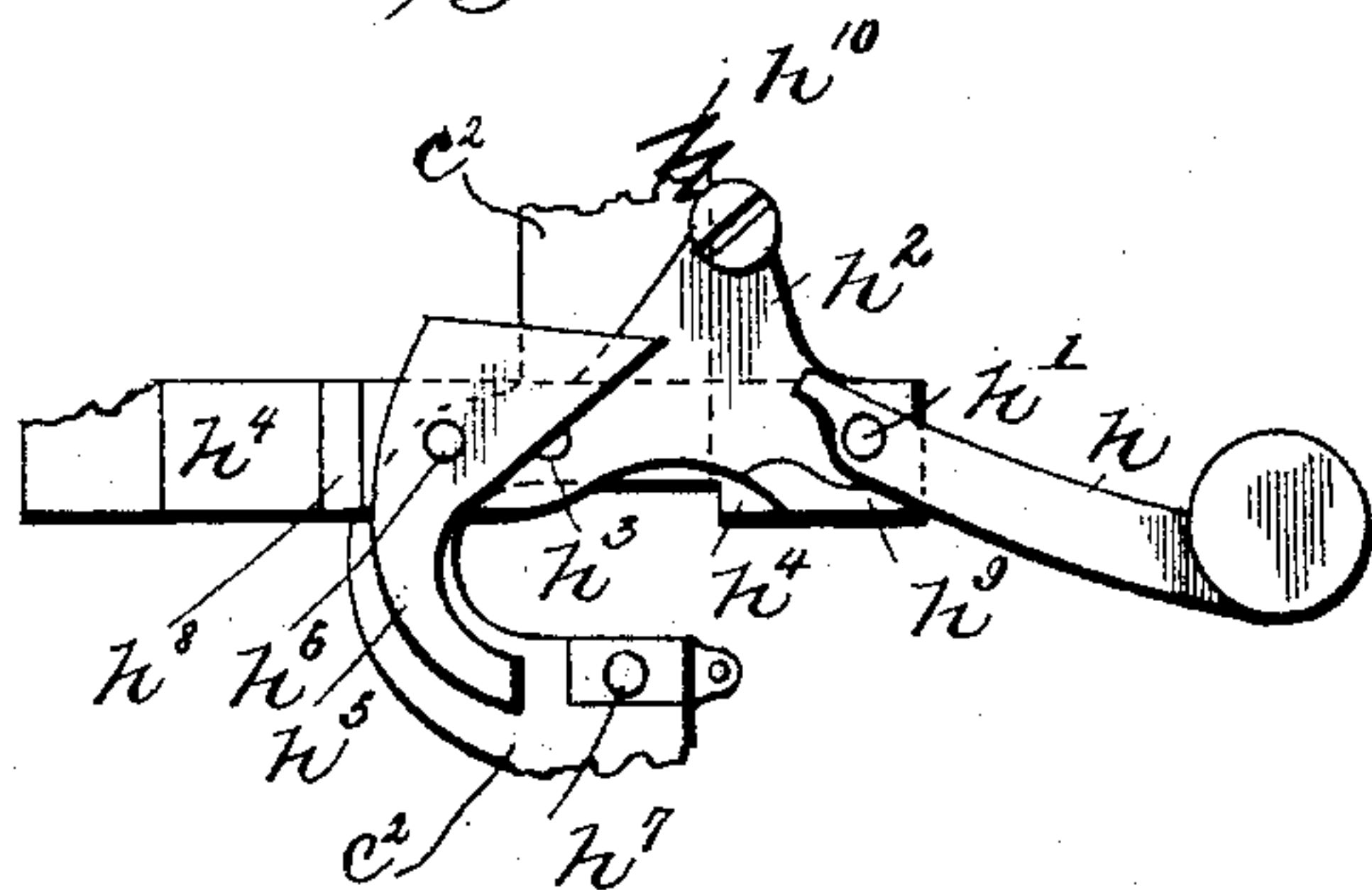


Fig. 6.

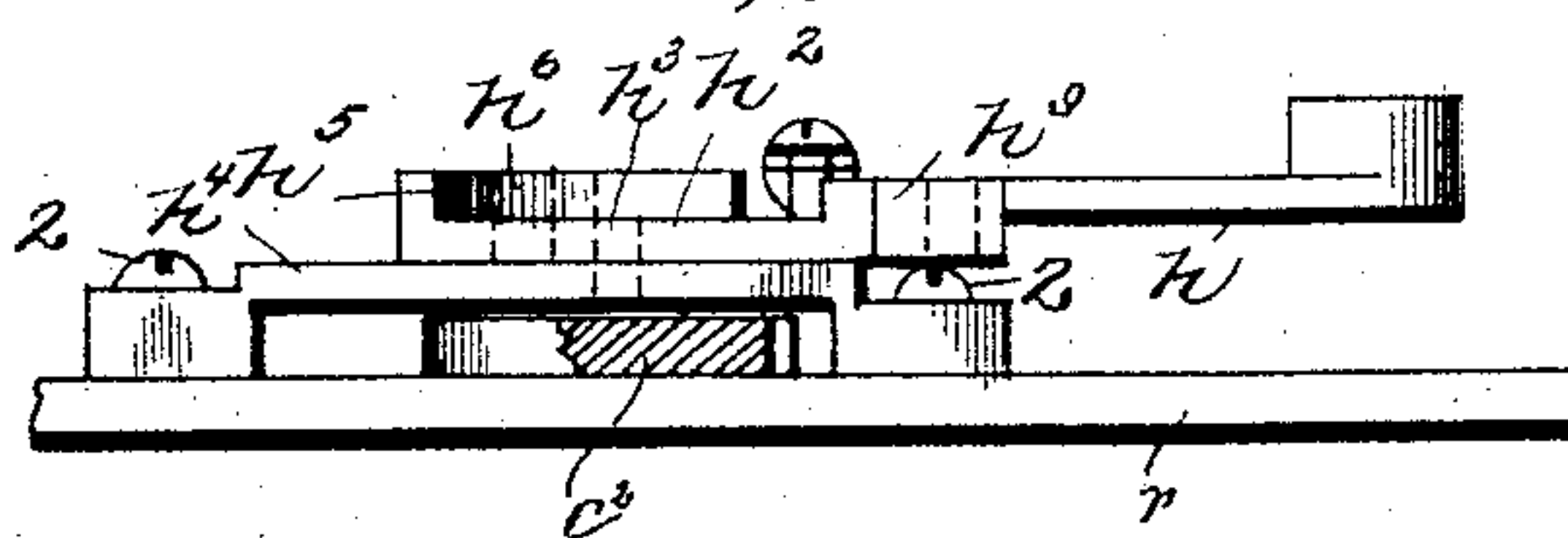


Fig. 7.

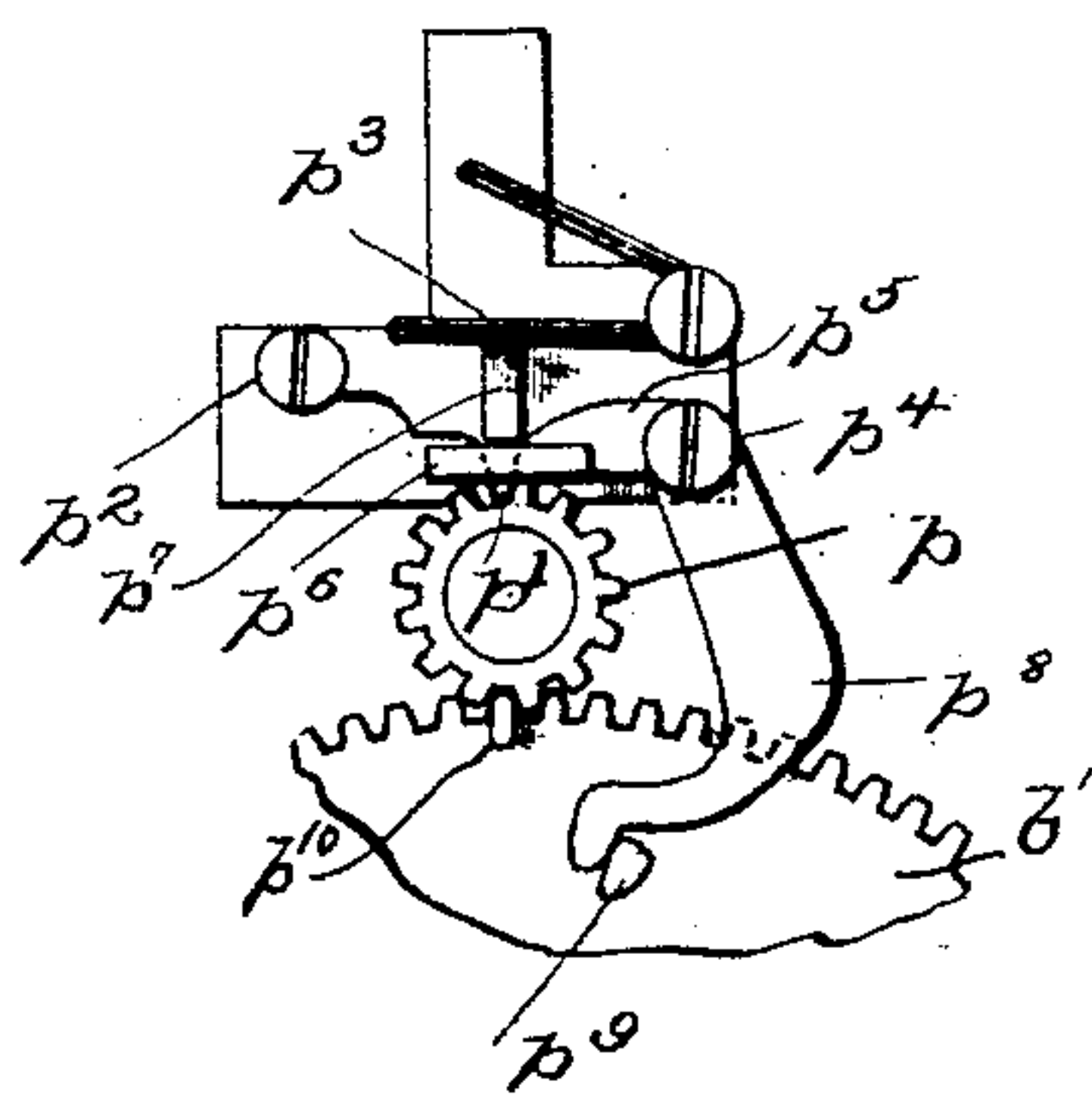
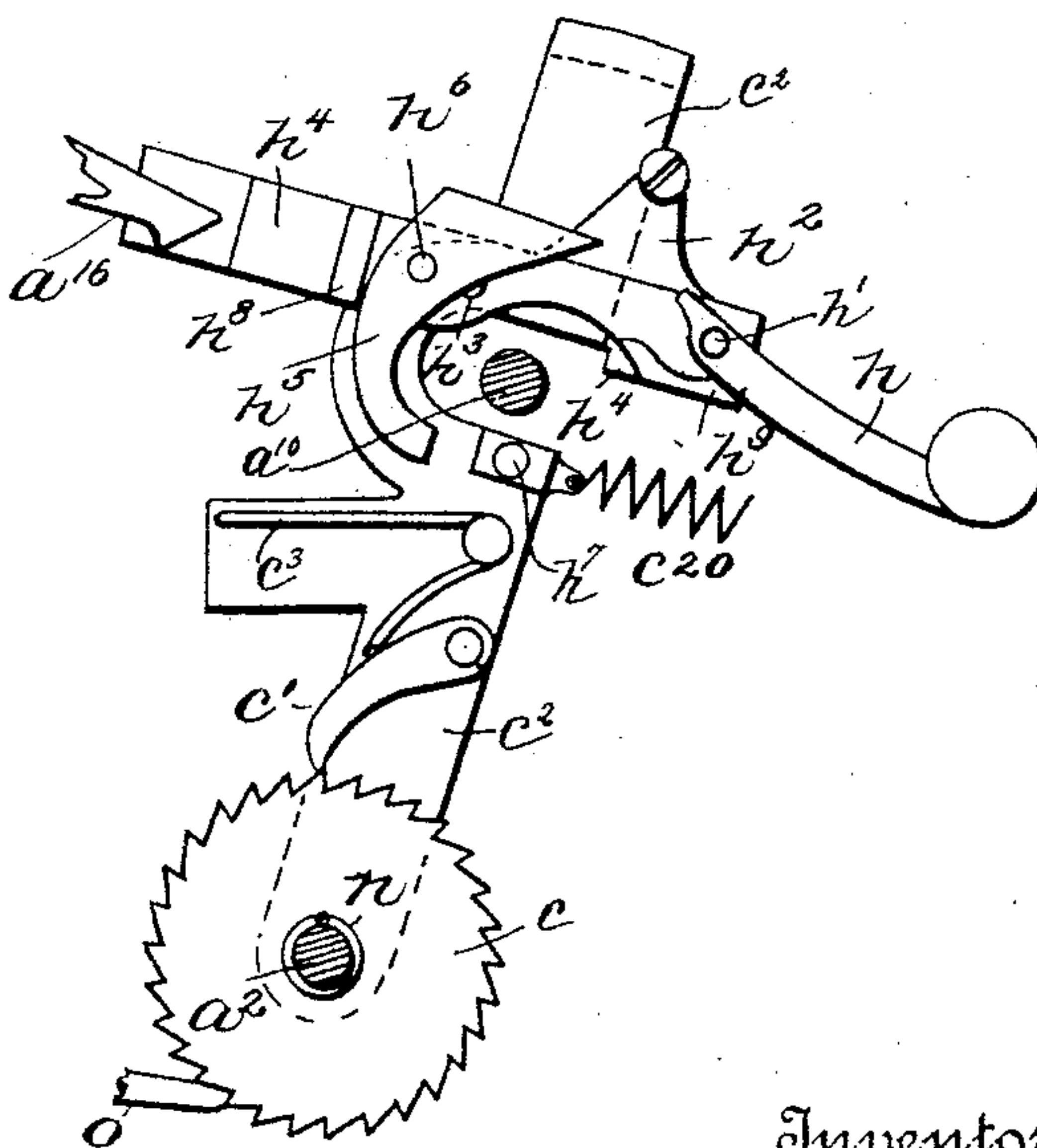


Fig. 8.



Witnesses

John D. Smith  
J. D. Lowry

Inventor

Louis C. De Sloovere.

By Crosby & Gregory,  
Attys



# UNITED STATES PATENT OFFICE.

LOUIS C. DE SLOOVERE, OF SALEM, MASSACHUSETTS.

## FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 470,373, dated March 8, 1892.

Application filed July 15, 1891. Serial No. 399,602. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS C. DE SLOOVERE, of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Fare-Registers, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to improve and simplify the construction of fare-registers such as shown and described in United States Patent No. 454,902, granted to me June 30, 1891; and it consists in details of construction to be hereinafter pointed out in the claims at the end of this specification.

Figure 1 shows a face view of the fare-register embodying this invention, the actuating device or pull-bar and also the setting-back device being omitted; Fig. 2, a cross-section of the fare-register shown herein, taken on the dotted line 2 2, Figs. 1 and 3; Fig. 3, a rear side view of the fare-register shown in Fig. 1, the rear plate being cut away to expose the operating parts; Fig. 4, a side view of the parts contained within the box or case, the latter being shown in section; Figs. 5 and 6, details of the striking apparatus of the audible alarm to be referred to. Fig. 7 is a detached view of the locking mechanism shown in the upper part of Fig. 3, the gear  $a^{14}$  being removed. Fig. 8 is a detail taken on the line 8 8, Fig. 2, looking down, to show the inner side of the actuating-arm and co-operating parts, the back plate being omitted.

The main frame-work comprises a front and a rear plate  $r$ , joined by suitable pillars. The main shaft  $a^{10}$  has fixed to it at one end a hand or pointer  $a^7$ , and also secured to said shaft is a toothed gear  $a^{14}$ . A sleeve  $b$  is mounted on the shaft  $a^{10}$ , which has fixed to it a hand or pointer  $a^8$  and also a toothed gear  $b'$ . A second sleeve  $b^2$  is mounted on the sleeve  $b$ , which has fixed to it a hand or pointer  $a^9$  and also a toothed gear  $b^3$ . The three toothed gears  $a^{14}$   $b'$   $b^3$  are all made of the same diameter and have an equal number of teeth. The driving-shaft  $a^2$  is journaled in the frame-work and has fixed to it a pinion  $b^5$  and has loosely mounted on it a pinion  $b^6$ . The pinion  $b^5$  engages the toothed gear  $b'$ , and the pinion  $b^6$  engages the toothed

gear  $a^{14}$ . A spring  $n$  surrounds the shaft  $a^2$  and bears firmly against the pinion  $b^6$  and against the ratchet-wheel  $c$ , (best shown in Figs. 2 and 3,) fixed to said shaft, the purpose of said spring being to hold the pinion  $b^6$  frictionally, so that it shall be turned by the shaft  $a^2$  in one direction to drive the toothed gear  $a^{14}$ , but may be turned in the opposite direction independent of and without rotating the shaft. A pawl  $c'$ , (see Figs. 2 and 3,) which engages and drives said ratchet-wheel  $c$ , is loosely connected to a pawl-carrying arm  $c^2$ , pivoted to the shaft  $a^2$ , and a spring  $c^3$  (see dotted lines, Fig. 3) is provided for pressing the pawl  $c'$  into engagement with the ratchet-wheel. The pawl-carrying arm  $c^2$  is made quite long and extends diametrically across the center of the plate  $r$ , being formed to pass around and not interfere with the main shaft  $a^{10}$ , as best shown in Fig. 3, the free end of said arm being bent outwardly at its extremity and extended through a slot in the plate  $r$ , as seen in Fig. 2. A cord, chain, or equivalent  $c^{10}$  (see dotted lines, Fig. 3) is connected to the said bent portion of the free end of said arm  $c^2$ , by which it may be moved on its pivotal point (shown in Fig. 2 as the downwardly-extended hub of the ratchet-wheel  $c$ ) to in turn move the ratchet-wheel forward step by step, the arm  $c^2$  being retracted by the spring  $c^{20}$ . A pawl  $o$  is pivoted on the rear plate  $r$  at  $o'$  and engages said ratchet-wheel  $c$ , serving as a back-stop therefor to prevent backward rotation, said pawl  $o$  having a projection  $o^2$  at its rear end, which is acted upon by a spring  $o^3$  to keep said pawl pressed into engagement with the ratchet-wheel. On the under side of the toothed gear  $b'$  a ratchet  $n^3$  is formed, (shown in section, Fig. 2, and in dotted lines, Fig. 3,) which is engaged by a pawl  $n^4$ , (shown in dotted lines, Fig. 3,) connected to the upper side of the toothed gear  $a^{14}$  to prevent any backward rotation of the gear  $b'$ . Three concentric dials  $a^4$   $a^5$   $a^6$  are provided for the three hands or pointers  $a^7$   $a^8$   $a^9$ , and it is intended that the hand  $a^9$ , with its dial  $a^6$ , shall register the hundreds, the hand  $a^8$ , with its dial  $a^5$ , shall register the units and tens, and the hand  $a^7$ , with its dial  $a^4$ , shall register units and tens; but the latter hand is adapted to be moved back to zero when-



ever desired—as at the end of a trip, for instance—while the other two hands move forward only.

Instead of moving the toothed gear  $b^3$  continuously, yet relatively slower than the toothed gear  $b'$ , as represented in the patent referred to, I provide mechanism by which it may be moved ahead one tooth just as the toothed gear  $b'$  completes a rotation, and, as herein represented, this mechanism consists of a pinion  $p$ , engaging said toothed gear  $b^3$ , and a locking device for holding said pinion in fixed position (see Fig. 3 and detached view, Fig. 8)—such as a dog  $p'$ , pivoted at  $p^2$  and held pressed into engagement with said pinion by a spring  $p^3$ , and a releasing device for said locking device, consisting of a lever pivoted at  $p^4$ , one arm of which, as  $p^5$ , has formed on it a projection  $p^6$ , which rests beneath a projection  $p^7$  on the dog  $p'$ , and the other arm  $p^8$  extends down and lies in the path of movement of the pin  $p^9$  on the upper side of the gear  $b'$ . (See Figs. 3 and 8.) The pinion  $p$  is made thicker than the gear  $b^3$ , (see Fig. 2,) so that the teeth on said pinion extend beyond the teeth of the gear  $b^3$ , and one of the teeth—as the zero-tooth  $p^{10}$ , for instance—of the gear  $b'$  is made quite high to engage once in each revolution of the gear  $b'$  the teeth on said pinion  $p$ , as represented in Figs. 2 and 7, the said tooth  $p^{10}$  engaging with the portion of the teeth on the pinion  $p$  which project beyond the gear  $b^3$ , as very clearly shown in Fig. 2. It will be seen that just as the gear  $b'$  completes its revolution the pin  $p^9$  thereon moves the lever  $p^5 p^8$  of the releasing device and through the projections  $p^6$  and  $p^7$  lifts the locking device or dog  $p'$ , and the tooth  $p^{10}$  engages the teeth of the pinion  $p$  and moves it ahead one tooth, thereby moving the gear  $b^3$  ahead one tooth. This mechanism or its equivalent insures the hand  $a^9$  moving by steps, at the end of each step pointing to a number and remaining at rest until it is moved the next step to the succeeding number, instead of moving slowly, but continually, over the face of the dial, thereby avoiding any confusion.

The striking mechanism for the audible alarm consists of a bell-hammer  $h$ , (see Figs. 3, 5, and 6,) pivoted at  $h'$  to a plate  $h^2$ , which is pivoted at  $h^3$  to a plate  $h^4$ , which is secured to the base-plate, as by screws 2 2, and a detent  $h^5$  is pivoted at  $h^6$  to the plate  $h^2$ , the lower end of which detent lies in the path of movement of a pin  $h^7$  on said pawl-carrying arm  $c^2$ . When the pawl-carrying arm  $c^2$  is moved on its pivotal point to move the ratchet-wheel  $c$  ahead one tooth, the pin  $h^7$  will strike the end of the detent  $h^5$ , and it, bearing against a projection  $h^8$  on the rear end of the plate  $h^2$ , causes said plate to turn on its pivot  $h^3$ , thereby moving the bell-hammer  $h$  away from the gong  $t$ . This movement will continue until the pin  $h^7$  passes by the end of the detent  $h^5$  and the latter slips over it, when the bell-hammer will be returned quickly

by the spring  $h^{10}$ , connected to the plate  $h^2$ , and will strike the gong. The bell-hammer  $h$ , being loosely connected to the plate  $h^2$ , will recede from the gong after striking it, so as not to diminish the sound. A projection  $h^9$  is formed on the plate  $h^2$ , which serves as a back-stop for the bell-hammer  $h$ . The detent  $h^5$ , being loosely connected to the plate  $h^2$ , as shown, permits the return of the parts  $h^7$  and  $c^2$  to their normal position as the pin  $h^7$  passes along the curved outer side of and turns the free end of the detent  $h^5$ , when the arm  $c^2$  is returned to its normal position by the spring  $c^{20}$ .

On the under side of the toothed gear  $a^{14}$  a bevel-gear  $d$  is formed, which is engaged by a bevel-gear  $d'$ , secured to a shaft  $d^2$  (see dotted lines, Fig. 3) and having its bearings in a frame  $d^3$ , attached to the plate  $r$  by suitable screws 3 3. (Shown in section, Fig. 3.) A ratchet-wheel  $d^4$  (clearly shown in Fig. 4) is secured to said shaft  $d^2$ , which is engaged by a pawl  $d^5$ , connected to a hub  $d^6$ , turning freely on said shaft  $d^2$ . By such connection the bevel-gear  $d'$  can be turned in one direction only, and, as herein represented, it is employed to set the toothed gear  $a^{14}$  back to zero or starting-point.

The gear  $a^{14}$  has on its upper side a pin  $a^{15}$ , (shown in dotted lines, Fig. 3,) which strikes the projecting beveled end of a plate  $a^{16}$  (see dotted lines, Fig. 3) and turns said plate on its pivot  $a^{17}$  until the portion  $a^{18}$  of said plate bears against a pin  $a^{19}$ , the gear being rotated in the direction of the arrow 50, Fig. 3, and said pin slips by the end of the plate  $a^{16}$ . When the gear is being brought back to zero, however, the pin acts upon the upper edge of plate  $a^{16}$  and forces it into the position shown in Fig. 3, thereby stopping the gear at the zero-point. This pivoted plate constitutes a stop to stop the retrograde motion of the gear at zero-point. As the conductor takes the fares he pulls the cord or chain  $c^{10}$ , rotating the toothed gears  $a^{14}$  and  $b'$  simultaneously step by step until he completes a trip. The toothed gear  $a^{14}$  is then set back to zero, or the starting-point, by rotating the hub  $d^6$  in the direction of the arrow 60, Fig. 3 or 4, the toothed gear  $b'$  at such time remaining at rest by reason of the pawl  $n^4$  on the gear  $a^{14}$  sliding over the teeth of the ratchet-wheel  $n^3$ , fast to the gear  $b'$ , as described. The gear  $b^6$  on the shaft  $a^2$  will at such time rotate freely on the shaft  $a^2$ , as hereinbefore described. The gear  $a^{14}$  is thus set back to zero on each trip. At the end of a trip the dials  $a^5 a^6$  and the hands  $a^8$  and  $a^9$  will indicate the total number of passengers, while the dial  $a^4$  and hand  $a^7$  will indicate the number of passengers on that particular trip.

I claim—

1. In a fare-register, a main shaft having fixed to it a gear and pointer or index, a sleeve on said shaft, having fixed to it a gear and pointer or index, and a second sleeve on said first sleeve, having fixed to it a gear and pointer



or index, a shaft provided with driving-pinions, a rotating wheel on said shaft, and an actuating-pull, combined with a pinion, as *p*, engaging a gear on the second sleeve, a locking device for it, a releasing device for said locking device, and means for moving said pinion forward one tooth at each time the locking device is released, substantially as described.

2. In a fare-register, three dials and three hands movable one with relation to the other, a main shaft or arbor, a toothed gear loose thereon, and a ratchet-wheel on said gear, a toothed gear fixed to the shaft or arbor carrying one of the hands, a pawl carried by said latter gear and in engagement with said ratchet-wheel to move said gears in unison in one direction, a bevel-gear on said latter toothed gear, a bevel-gear engaging therewith, its shaft, a rotatable hub, and a pawl-and-ratchet connection between said hub and bevel-gear shaft, whereby the latter may be moved in one direction only by said hub and bevel-gear, substantially as described.

3. In a fare-register, a main shaft and gear and pointer or index fixed to it, a sleeve on said shaft, having a gear and pointer fixed to it, and a second sleeve on said first sleeve, having a gear and pointer fixed to it, combined with a driving-shaft, a fixed pinion on it, engaging one of said gears, and a loose pinion on said shaft, engaging another one of the aforesaid gears, and a spring for holding said loose pinion frictionally to turn with the shaft in one direction, a ratchet-wheel fixed to said

shaft, and an actuating-pull for said ratchet-wheel, substantially as described.

4. In a fare-register, three dials, and three hands movable one with relation to the other, and actuating mechanism for said hands, combined with a bell and striking mechanism therefor, consisting of a pivoted bell-hammer *h*, pivoted plate *h*<sup>2</sup>, fixed plate *h*<sup>4</sup>, to which said plate *h*<sup>2</sup> is pivoted, a pivoted detent *h*<sup>5</sup> on plate *h*<sup>2</sup>, spring *h*<sup>10</sup>, normally to control said plate *h*<sup>2</sup> and bell-hammer, and pin, as *h*<sup>7</sup>, on the actuating-pull to co-operate with the said detent for operating said striking mechanism, substantially as described.

5. In a fare-register, three dials and three hands movable one with relation to the other, as described, a toothed gear fixed to the shaft or arbor of one of said hands, means for moving it forward step by step, and means for setting it back to zero, combined with a pin, as *a*<sup>15</sup>, on said gear, and a stopping device consisting of a pivoted plate *a*<sup>16</sup>, having a beveled end, and a stop-pin *a*<sup>19</sup> for the plate and with which plate said pin *a*<sup>15</sup> co-operates to stop the said gear at zero when rotated in a backward direction, the pin *a*<sup>15</sup> passing by the beveled end of the plate when the gear is rotated forward, substantially as described.

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

LOUIS C. DE SLOOVERE.

Witnesses:

BERNICE J. NOYES,  
EDWARD F. ALLEN.