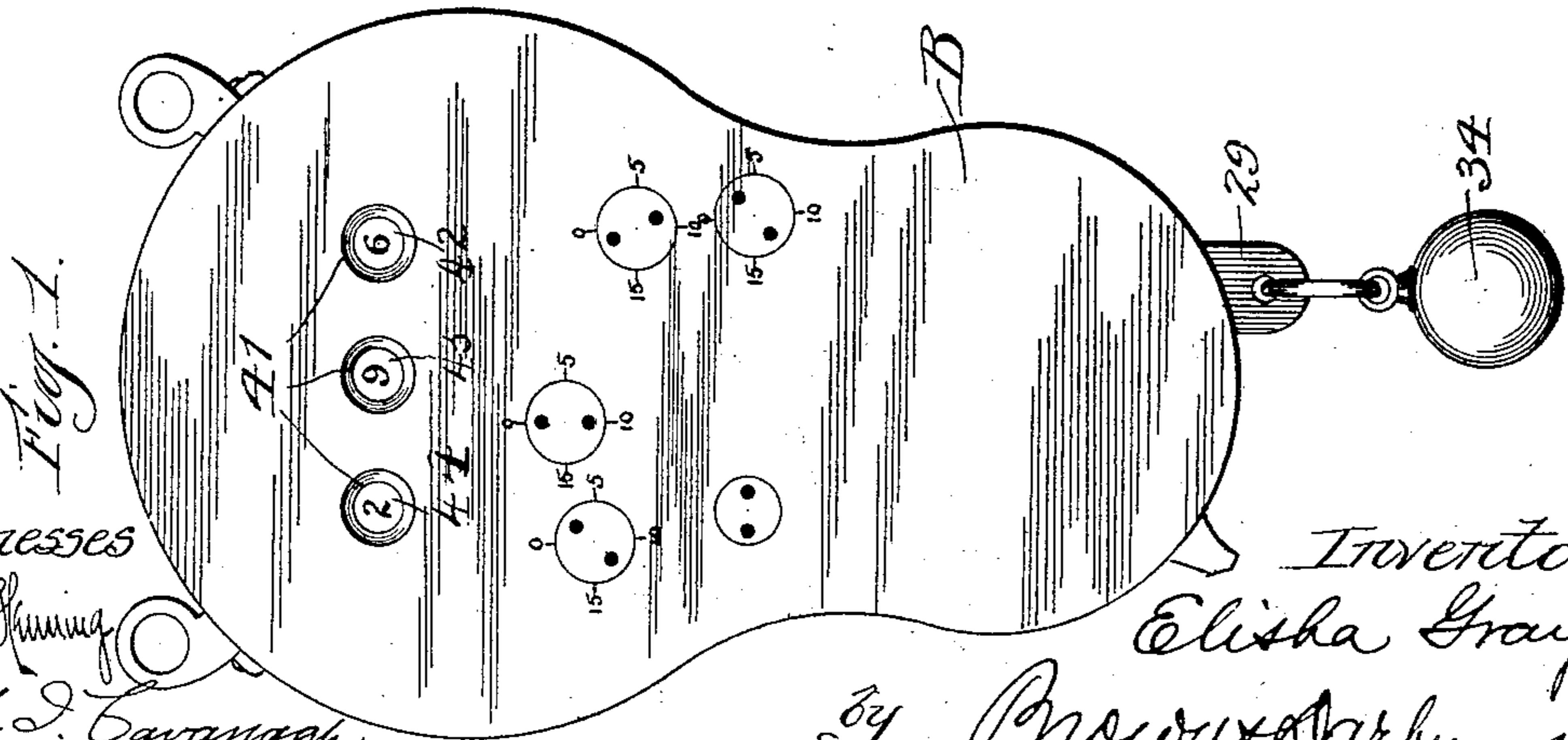
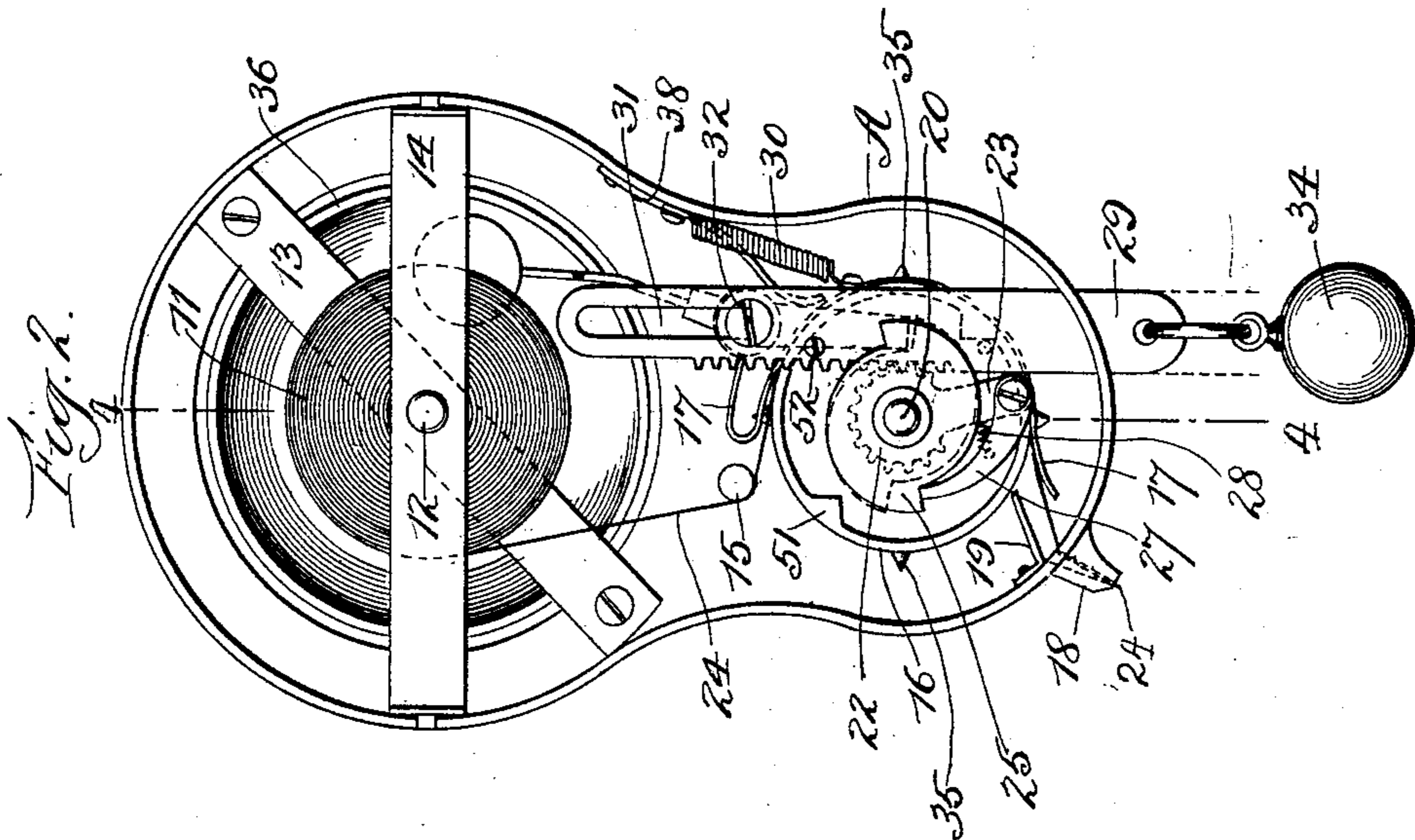
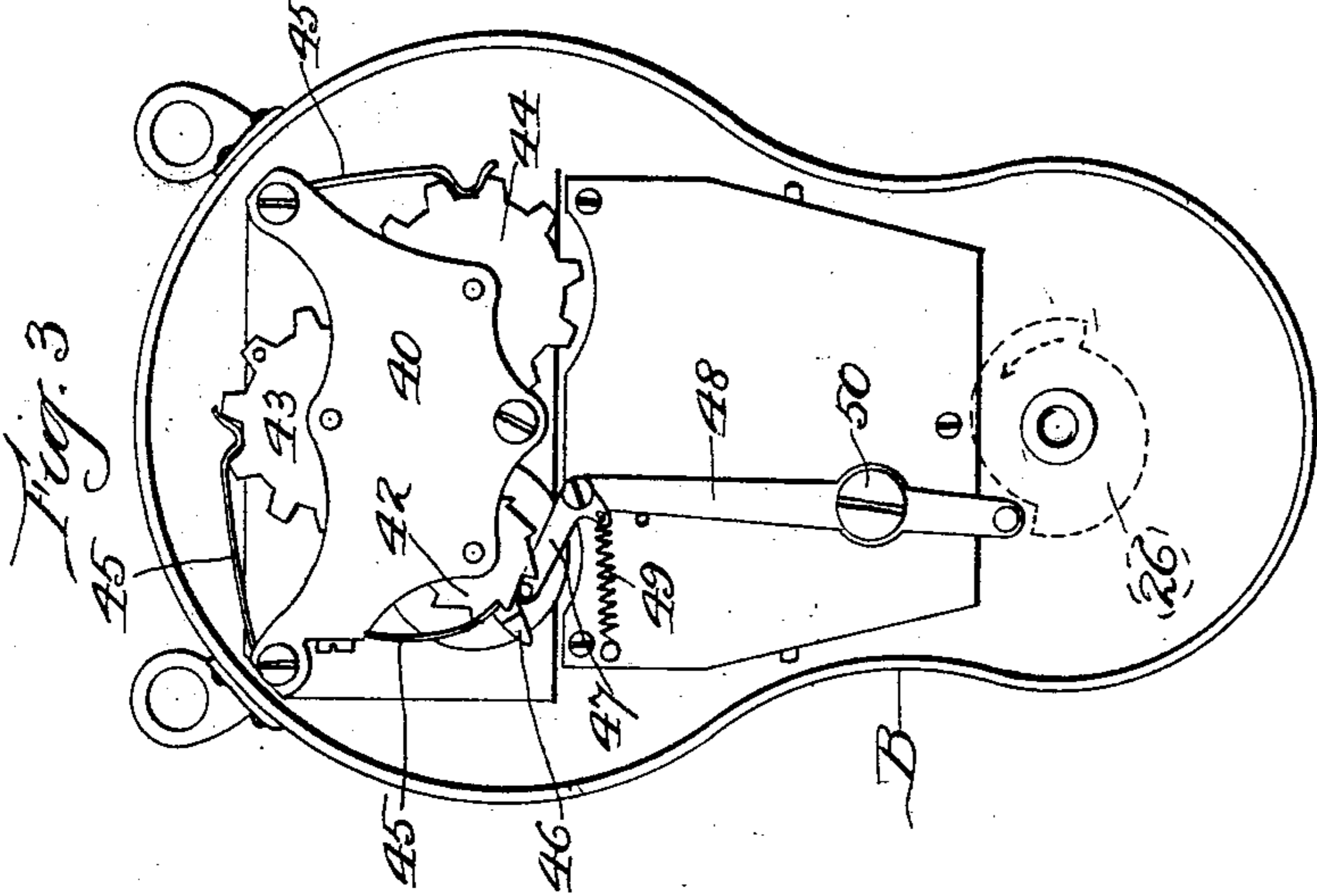


E. GRAY.  
FARE REGISTER AND INDICATOR.

No. 561,310.

Patented June 2, 1896.



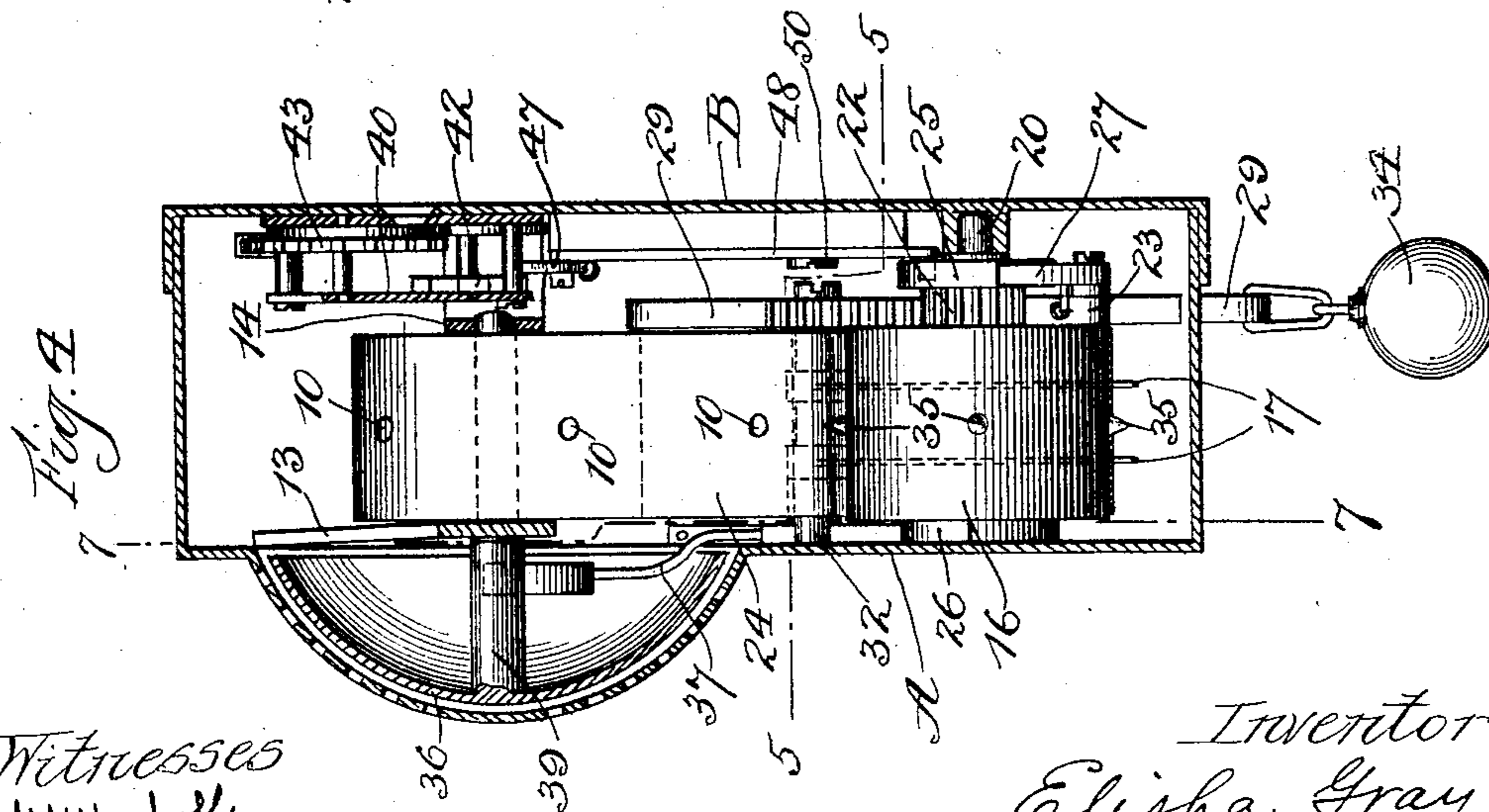
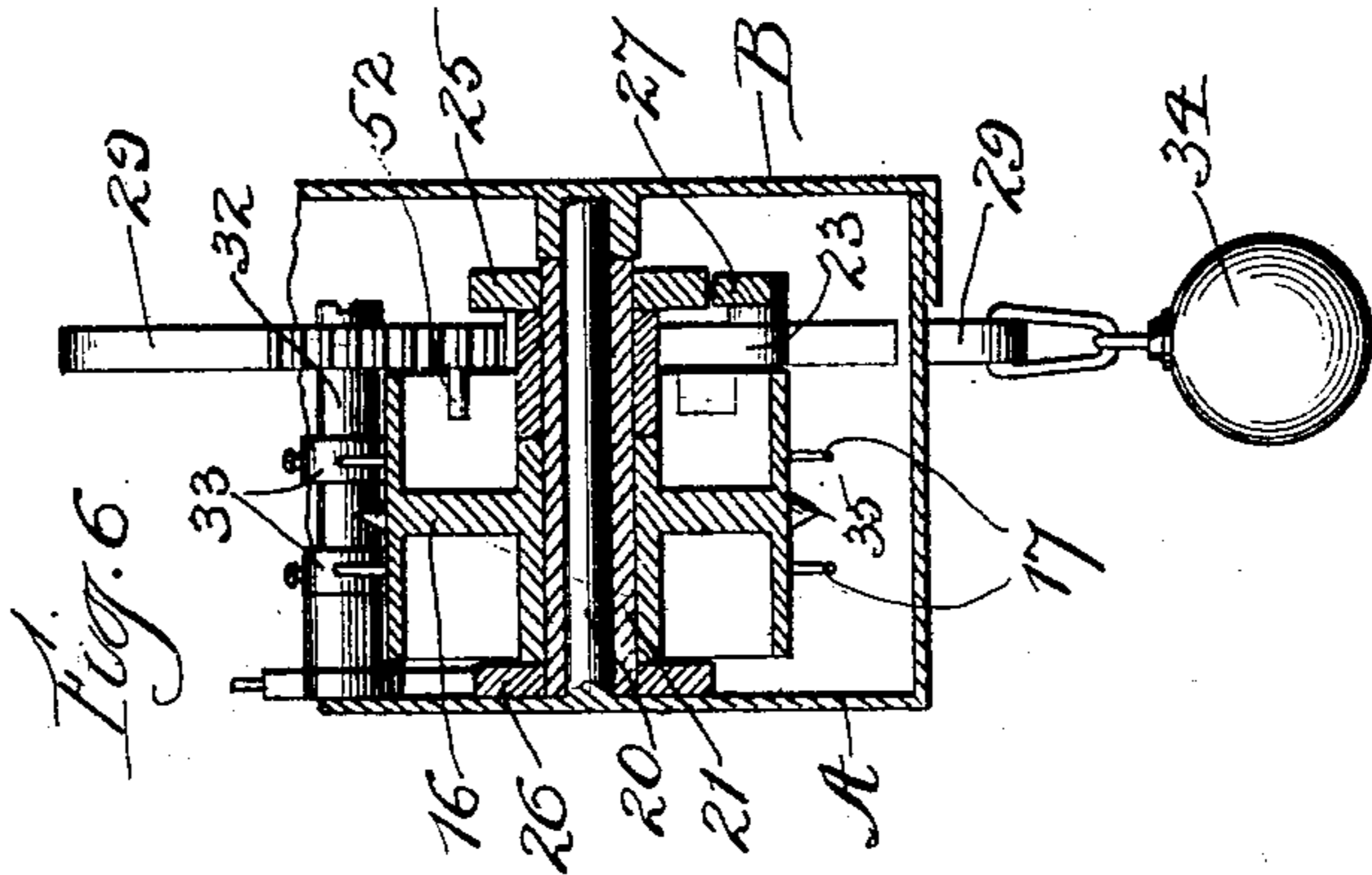
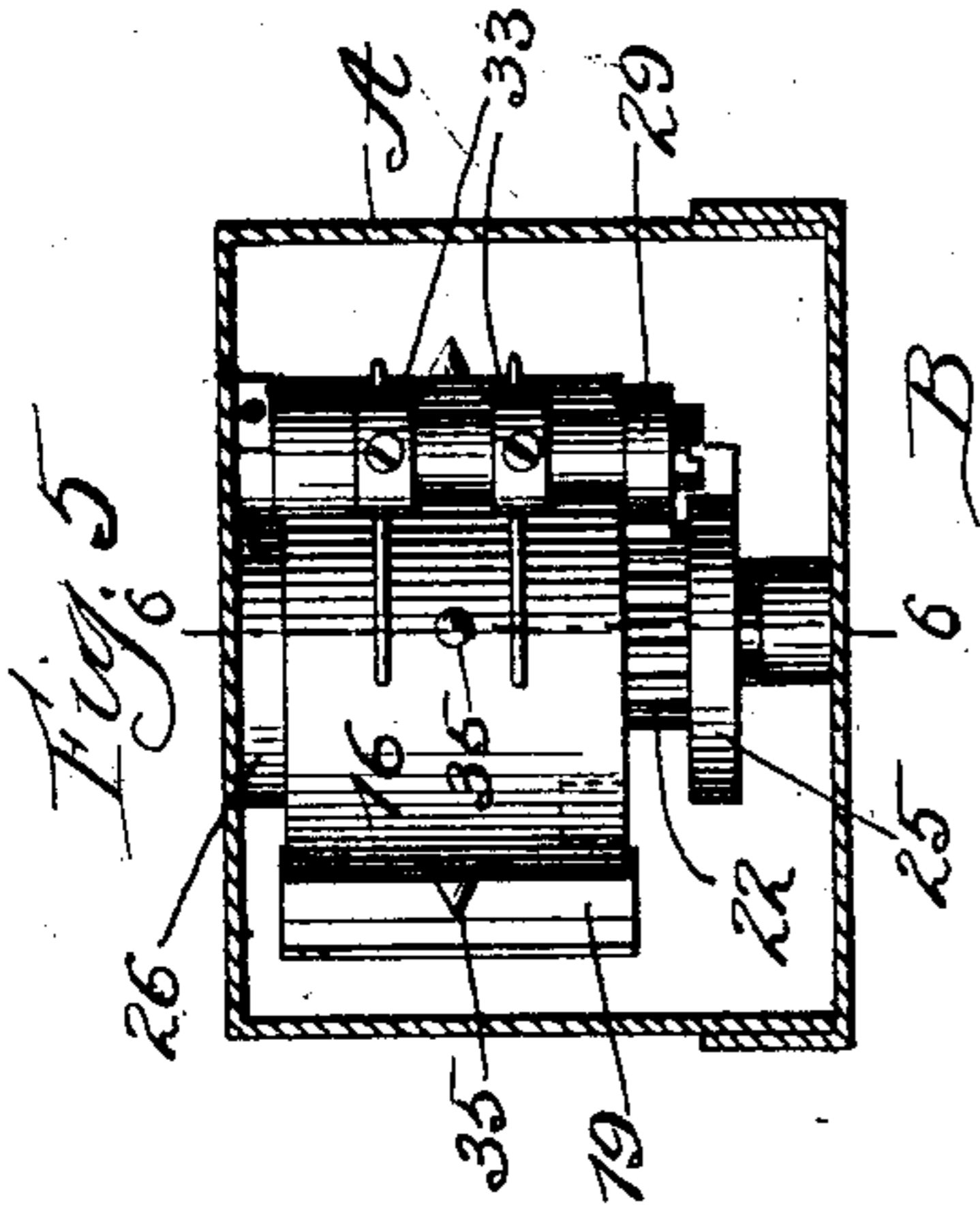
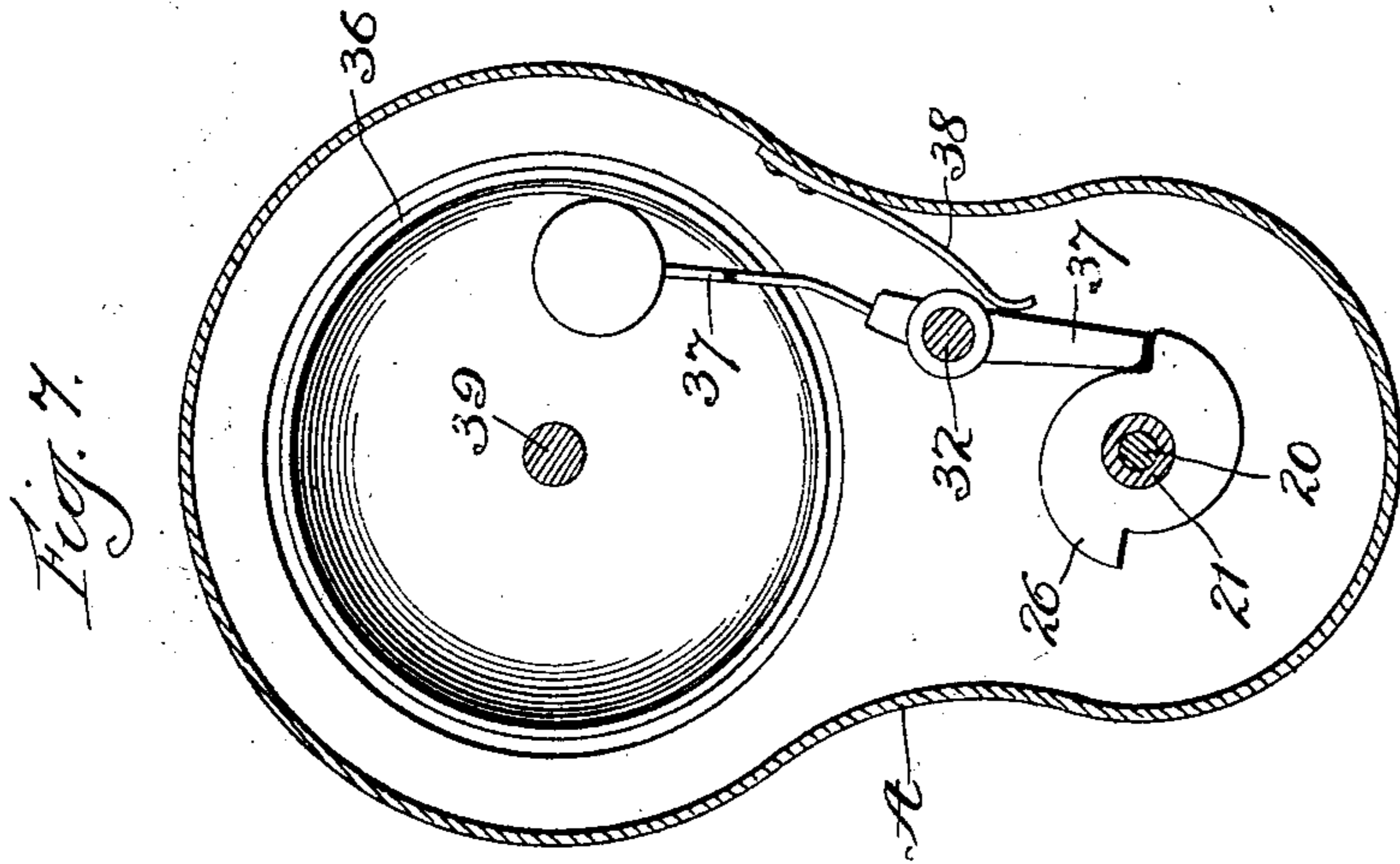
Witnesses  
W. J. Fleming  
M. J. Cavanagh.

Inventor  
Elisha Gray  
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# UNITED STATES PATENT OFFICE.

ELISHA GRAY, OF HIGHLAND PARK, ILLINOIS.

## FARE REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 561,310, dated June 2, 1896.

Application filed November 8, 1895. Serial No. 568,264. (No model.)

*To all whom it may concern:*

Be it known that I, ELISHA GRAY, a citizen of the United States, residing at Highland Park, in the county of Lake and State of Illinois, have invented a new and useful Fare Register and Indicator, of which the following is a specification.

This invention relates to fare registers and indicators.

10 The object of the invention is to provide a construction wherein fares are registered, indicated, and receipted for.

The invention consists, substantially, in the construction, combination, location, and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally specifically set forth in the appended claims.

20 Reference is had to the accompanying drawings and to the various views and reference-signs appearing thereon, and wherein—

Figure 1 is a view in elevation of a construction embodying my invention. Fig. 2 is a view similar to Fig. 1 with the back plate or cover removed, showing the arrangement of the operating mechanism. Fig. 3 is a view of the reverse side or face of the back or cover, showing the registering mechanism applied thereto, a form of lock being indicated. Fig. 30 4 is a longitudinal sectional view of the entire apparatus on the line 4 4, Fig. 2. Fig. 5 is a transverse sectional view on the line 5 5, Fig. 4, showing the receipt feed-drum. Fig. 6 is a central sectional view taken on the line 6 6, Fig. 5. Fig. 7 is a sectional view on the line 7 7, Fig. 4, showing the arrangement of the bell.

40 The same part is indicated by the same reference-sign wherever it occurs throughout the several views.

Reference-sign A designates a box or casing of any desired size and form adapted for the purposes required and in which are mounted and arranged the various mechanisms hereinafter to be described. To the casing A is adapted to be secured and locked in any desirable position or suitable manner the back plate or cover B, by means of which the mechanism may be inclosed, and when the said plate or cover is locked the registering, receipting, and indicating mechanisms are

thereby securely protected from unauthorized tampering.

The receipt, ticket, or other article designed to be delivered from the apparatus (previously printed or otherwise prepared, as by being provided with a row of suitably-spaced perforations 10) is carried in a coil 11, rolled upon a shaft 12, suitably journaled, as in cross-bars 13 14, and from which said receipt, ticket, or other article is reeled off in a strip or web 24 and is fed over a suitably-arranged guide 15, thence around a delivery-roll 16, being guided and held to said roll by the guiding springs or arms 17 and delivered from the casing through the mouthpiece 18. A stop 19 may be provided to guide the end of the strip into the mouthpiece 18.

I will now describe the manner of operating the feed and delivery roll 16.

70 Within the casing A is mounted a pin 20, upon which I arrange a sleeve 21. The roll 16 is mounted upon to rotate with sleeve 21. A gear-wheel 22, carrying an arm 23, is arranged to receive sleeve 21 loosely through the hub thereof, thereby permitting said hub to rock loosely upon said sleeve. Mounted at each end of sleeve 21 to rotate with said sleeve is a cam 25 26. In the particular form shown each cam 25 26 is provided with two shoulders arranged diametrically opposite each other, and pivoted to arm 23 of the gear 22 is a pawl 27, yieldingly held in position to engage one of said cams by means of spring 28, the end of said pawl 27 being adapted to engage the shoulders of the cam, thereby constituting a ratchet mechanism. From this construction it will be seen that when gear-wheel 22 is rocked in one direction the pawl 27 will engage a shoulder on cam 25 and thereby effect a rotation of said cam, and hence also of sleeve 21 and roll 16, and when said gear is rocked in the opposite direction the pawl 27 will be carried back over the cam-surface until it falls behind another shoulder or ratchet-tooth in position to advance the cam and hence also the roll 16 another step. A rack-bar 29, having one end thereof arranged to project out of casing A a sufficient distance to be conveniently grasped, is provided and is arranged to engage the teeth of gear 22. A spring 30 serves to normally hold

said rack-bar in the extreme inward limit of its endwise movement. The rack-bar 29 may be held and guided in its movements in any suitable manner, as by being slotted, as at 5 31, to receive a guiding-pin 32, or in any other suitable manner. Collars 33, carried by pin 32 and adjustable thereon, serve to support the guide-springs 17. In the operation of this part of my invention the projecting end of 10 rack-bar 29, which, if desired, may carry any suitable grasping device, as ball 34, is grasped and pulled endwise against the action of spring 30. The movement of rack-bar 29 endwise causes gear 22 to rotate, carrying with 15 it arm 23 and pawl 27, which engages the tooth or shoulder on cam 25, thereby rotating sleeve 21 and feed-roll 16 through a distance determined by the length of throw of pawl 27, thereby effecting a feed of a predetermined length of web or strip 24 out of the casing A through mouthpiece 18, which is torn 20 off by the operator as a receipt for the fare paid, or as a transfer-ticket, or for any other suitable or desired purpose.

25 In order to secure absolute accuracy and uniformity in the length of the tickets or receipts issued from the issuing or feed mechanism, which is a consideration of the highest importance in a successful apparatus, the perforations 10 in the strip of ticket or receipt 30 material are arranged a distance apart corresponding to the length of the ticket or receipt which it is desired to issue, and the periphery of feed and delivery roll 16 is provided 35 with projections or ribs 35, arranged a peripheral distance apart corresponding to the distance between adjacent perforations 10, and adapted to enter said perforations of the web or strip 24, as the roll 16 is rotated, thereby insuring a certain and positive feed of a 40 predetermined uniform length of ticket or receipt at each actuation of the feed roll or drum 16.

45 In the particular form of apparatus shown the cams and sleeve are moved one-half a rotation to each complete reciprocation of rack-bar 29; but it is obvious that the apparatus may be so constructed and relatively arranged as to impart any other relative amount of 50 movement to the cams and roll upon each full reciprocation of rack-bar 29 and still fall within the spirit and scope of my invention, and still secure the desired result of effecting a predetermined definite length of feed of the 55 web 24.

60 It is important that the delivery-drum 16 be prevented from rotating farther than the amount necessary to deliver a ticket or receipt of a length previously determined on, and hence it is necessary to provide a stop for said wheel which will operate to prevent the rotation of the drum, by its own momentum or otherwise, upon an extreme movement of rack-bar 29 in a direction to rotate said 65 drum, at the same time permitting the bar 29 to return to its normal position under the influence of its spring without interference

from said stop. This desirable result may be accomplished in many ways in accordance with the spirit of my invention. I have 70 shown a simple and efficient arrangement for securing the desired end, wherein I provide lugs 51 upon the inner surface of the drum near the edge thereof, and I mount a pin 52 in rack-bar 29 in position to be engaged by 75 the front edge or side of a lug 51 when the bar 29 is withdrawn from the casing to the limit of its movement, thereby arresting the rotation of the drum. The lugs 51 are provided with inclined sides, which, when the 80 drum is rotated into position for the lug to engage the pin in the rack-bar, occupies a position in parallelism with the direction of reciprocation of said bar, thereby not only 85 arresting the rotation of the drum, but leaving the parts in such relative positions that the bar 29 may readily return to its normal position without interference. This stop, in conjunction with the end of the slot in the rack-bar, constitutes a stop for the several 90 mechanisms actuated by said rack-bar.

I will now describe the bell and its actuating mechanism.

Within the casing A, in any suitable or convenient position, I mount a bell 36 upon any 95 suitable support, as 39. The lever 37 is suitably pivoted intermediate its ends—as, for instance, upon pin 32—and has one of the ends thereof arranged to be engaged by cam 26 upon sleeve 21. (See Fig. 7.) A spring 100 38 serves to hold the lever in contact with the periphery of said cam. The other end of said lever 37 carries the bell hammer or clapper. When, therefore, sleeve 21 and the cam 26 are rotated, the bell is operated. The 105 cam 26 is, in practice, provided with as many shoulders as there are engaging shoulders or teeth for pawl 27. Therefore the bell is sounded at each stroke of said pawl, and hence at each reciprocation of rack-bar 29. 110

I will now describe the registering mechanism.

Suitably mounted in a bracket 40 are any desired number of registering-wheels, having printed or otherwise placed on one face thereof 115 the numbers arranged to be shown through the casing A, as seen at 41, Fig. 1. These wheels may be of any suitable ordinary or well-known form of multiplying-wheels—that is, each succeeding wheel is arranged to be advanced one 120 step upon one rotation of the preceding wheel, in order to register in multiples, say, of ten, the wheel 42 being the units, wheel 43 tens, wheel 44 the hundreds, and so on to any desired denomination. The springs 45 serve to 125 hold the wheels in position when advanced. The units-wheel is advanced by any suitable step-by-step mechanism, so relatively arranged as to be operated through one step upon each actuation of the receipt-delivery 130 roll 16 and the bell-sounding mechanism. In the particular form of apparatus shown, lever 48 and pawl 47 are arranged to engage the teeth of wheel 42, the other end of said lever

being arranged in the path of cam 26, carried upon sleeve 21. A spring 49 serves to hold the lever in engagement with the periphery of said cam. The pivot 50 of lever 48, intermediate the ends of said lever, is so positioned relative to the ends of said lever that each actuation of said lever by cam 26 effects an advancement of the units registering-wheel just one step. From the foregoing description it will be seen that this registering is effected coincidentally with the issuance of the receipt and the sounding of the bell. It will also be observed that sleeve 21 constitutes in effect the master part of my invention, from which the several mechanisms hereinbefore described are coincidentally actuated.

Many alterations and variations would readily suggest themselves to persons skilled in the art and still fall within the spirit and scope of my invention. I do not desire, therefore, to be limited or restricted to the exact construction and arrangement shown; but,

Having explained the object and nature of my invention and a form of mechanism embodying the same, and having explained the construction and mode of operation of such mechanism, what I claim as new and of my own invention, and desire to secure by Letters Patent of the United States, is—

1. In a fare-register, a casing, a rotatable sleeve mounted therein, cams secured to said sleeve, at opposite ends thereof, a feed-drum, also secured to said sleeve, a bell-sounding mechanism actuated by one of said cams, and a registering mechanism actuated by the other of said cams, and means for rotating said sleeve; as and for the purpose set forth.

2. In a fare-register, a casing, a rotatable sleeve mounted therein, cams secured to said sleeve at opposite ends thereof, a feed-drum also secured to said sleeve, a bell-sounding mechanism mounted in said casing and actuated by one of said cams, a registering mechanism also mounted in said casing and actuated by the other of said cams, and a ratchet mechanism for rotating said sleeve; as and for the purpose set forth.

3. In a fare-register, a casing, a rotatable sleeve mounted therein, a cam secured to said sleeve at each end thereof, a feed-drum secured to said sleeve for feeding and delivering a ticket or receipt, a bell-sounding mechanism mounted in said casing and actuated by one of said cams, a registering mechanism also mounted in said casing and actuated by the other of said cams, a gear-wheel loosely mounted on said sleeve, a ratchet mechanism for rotating said sleeve, and a rack-bar for engaging said gear-wheel and rotating the same when said bar is reciprocated endwise; as and for the purpose set forth.

4. In a fare-register, a casing, a roll of ticket material mounted therein, a rotatable sleeve mounted in said casing, a feed-drum secured to said sleeve, for engaging and feeding the strip of ticket material, a gear loosely mounted on said sleeve, a ratchet mechanism, actuated

by said gear, and a reciprocatory rack-bar for actuating said gear and a stop carried by said drum for engaging said rack-bar to limit the rotation of said drum; as and for the purpose set forth.

5. In a fare-register, a rotatable sleeve, a registering mechanism and receipt or ticket issuing mechanism, actuated by the rotation of said sleeve, and means for rotating said sleeve; as and for the purpose set forth.

6. In a fare-register, a rotatable sleeve, a registering mechanism, a ticket or receipt issuing mechanism, and a bell-sounding mechanism, each of said mechanisms actuated in unison by the rotation of said sleeve, and means for rotating said sleeve; as and for the purpose set forth.

7. In a fare-register, a casing, a roll of ticket material mounted therein, the web of said roll provided with suitably-spaced perforations, a feed-drum provided with peripheral ribs or projections arranged to be received in said perforations and means for rotating said drum and a stop carried by said drum for arresting the rotation thereof; as and for the purpose set forth.

8. In a fare-register, a casing, a roll of ticket material mounted therein, the web of said roll provided with suitably-spaced perforations, a feed-roll provided with peripheral ribs or projections arranged to be received in said perforations, a ratchet mechanism arranged to periodically rotate said drum and a stop carried by said drum for engaging said ratchet mechanism to arrest the rotation of said drum; as and for the purpose set forth.

9. In a fare-register, a ticket or receipt delivering mechanism, comprising a drum, a support therefor, cams mounted on said support at opposite ends thereof, a fare-registering mechanism actuated by one of said cams, bell-sounding mechanism actuated by the other of said cams, and means for operating said support; as and for the purpose set forth.

10. In a fare-register, a sleeve, cams mounted thereon, a drum also mounted on said sleeve, said cams and drum rotating with said sleeve, fare-registering and bell-sounding mechanisms, actuated by said cams, and means for rotating said sleeve through a predetermined arc; as and for the purpose set forth.

11. In a fare-register, a support, a gear loosely mounted on said support, a ratchet mechanism operated by said gear to move said support through a predetermined arc, a fare-registering and receipt or ticket issuing mechanisms, actuated by the movement of said support, and means for rocking said gear; as and for the purpose set forth.

12. In a fare-register, a support, a gear loosely mounted thereon, a ratchet mechanism actuated by said gear and imparting a step-by-step rotation to said support, fare-registering, and ticket or receipt issuing mechanisms actuated by the step-by-step rotation of said support, fare-registering and ticket or re-

ceipt issuing mechanisms actuated by the step-by-step rotation of said support, and means for rocking said gear; as and for the purpose set forth.

5 13. In a fare-register, a support, a gear loosely mounted thereon, a ratchet mechanism actuated by said gear for imparting to said support a step-by-step rotation, fare-registering and ticket or receipt issuing mechanisms,  
10 actuated by the rotary movement of said support, and a reciprocatory rack-bar, for engaging and rocking said gear; as and for the purpose set forth.

14. In a fare-register, a sleeve, a gear loosely  
15 mounted thereon, a shouldered cam mounted on to revolve with said sleeve, an arm carried by said gear, a pawl actuated by said arm and arranged to engage the shoulders on said cam; whereby a step-by-step rotation is imparted  
20 to said sleeve, fare-registering and ticket or receipt issuing mechanisms actuated by the rotation of said cams and sleeve, a reciprocatory rack-bar for engaging said gears; as and for the purpose set forth.

25 15. In a fare-register, a support, a gear loosely mounted thereon, a ratchet mechanism actuated by said gear for imparting a step-by-step rotation to said support, fare-registering and ticket or receipt delivering  
30 mechanisms actuated by the rotation of said support, a reciprocatory rack-bar for engaging and rocking said gear, and means for guiding said rack-bar; as and for the purpose set forth.

35 16. In a fare-register, a support, a gear loosely mounted thereon, a ratchet mechanism actuated by said gear for imparting a step-by-step rotation to said support, fare-registering, bell-sounding and ticket or re-

ceipt delivering mechanisms, actuated by the 40 rotary movement of said support, and a reciprocating rack-bar for engaging and rocking said gear, whereby said several mechanisms are actuated in unison; as and for the purpose set forth.

45 17. In a fare-register, the combination of registering mechanism, a ticket or receipt delivering mechanism, and bell-sounding mechanism, means for simultaneously actuating  
50 said several mechanisms, and a stop for arresting the action of said several mechanisms at the limit of their movements; as and for the purpose set forth.

18. In a fare-register, a casing, a roll of  
55 ticket material mounted therein, the web of said roll provided with suitably-spaced perforations, a feed-roll mounted in said casing and provided with peripheral ribs or projections arranged to be received in said perforations, a reciprocatory rack, a ratchet mechanism actuated thereby for rotating said  
60 feed-roll and a lug formed on said feed-roll and for engaging said rack to limit the movement of rotation of said feed-roll at each actuation of said rack; as and for the purpose set forth.

19. In a fare-register, a feed-drum, a stop carried thereby, a rack-bar for rotating said drum, said bar engaged by said stop to prevent further rotation of said drum at the  
70 limit of action of said bar; as and for the purpose set forth.

In witness whereof I have hereunto set my hand this 4th day of November, 1895.

ELISHA GRAY.

In presence of—

MICHAEL I. CAVANAGH,  
S. E. DARBY.