

(No Model.)

5 Sheets—Sheet 1.

R. DE SAINTE-MARIE.
FARE REGISTER FOR VEHICLES.

No. 452,123.

Patented May 12, 1891.

Fig. 2.

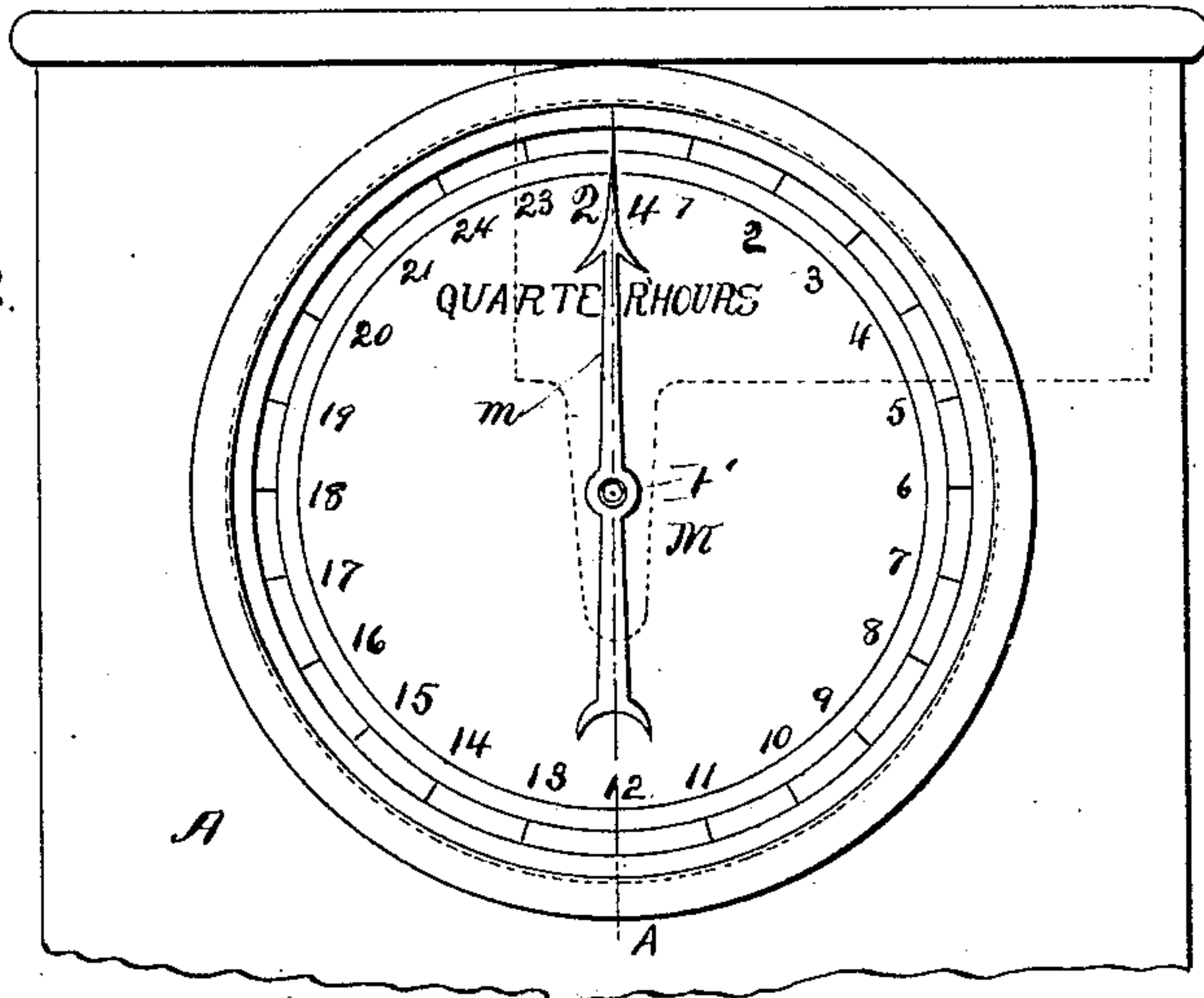


Fig. 1.

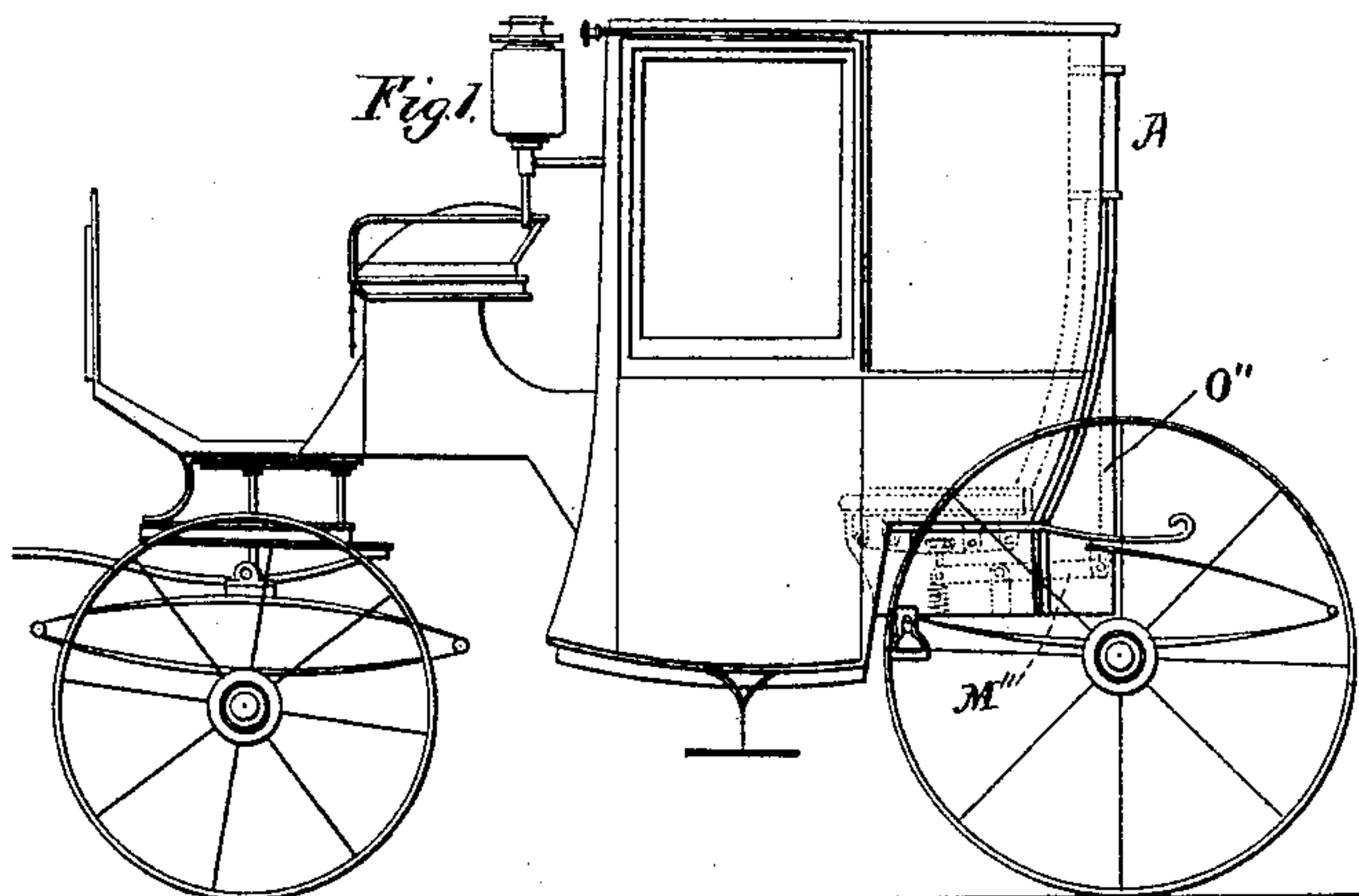
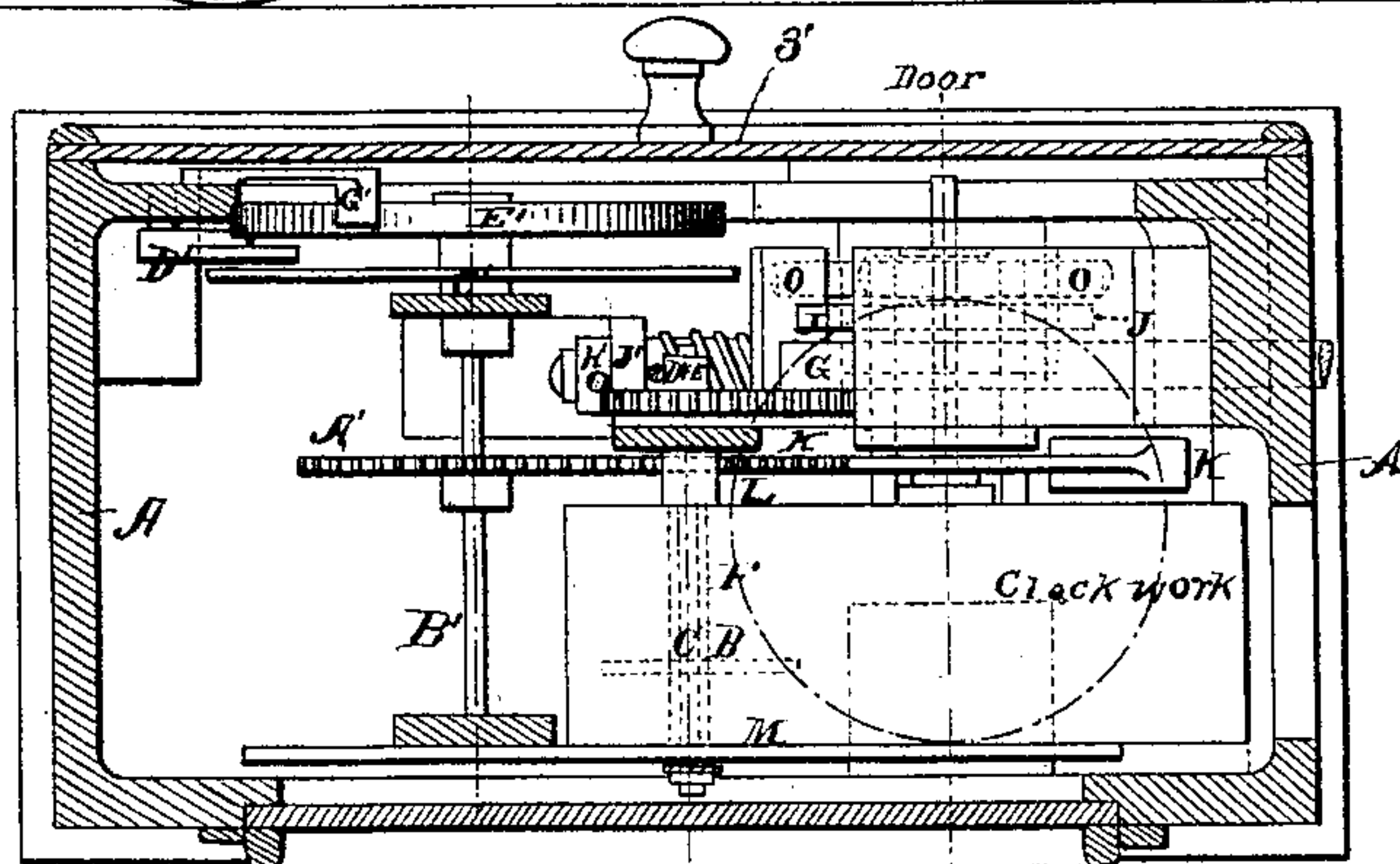


Fig. 5.



Attest:
Geo T. Smallwood,
R. L. Hogue.

Inventor:
Robert de Sainte Marie
by Pollock Mauro
his attorney,

(No Model.)

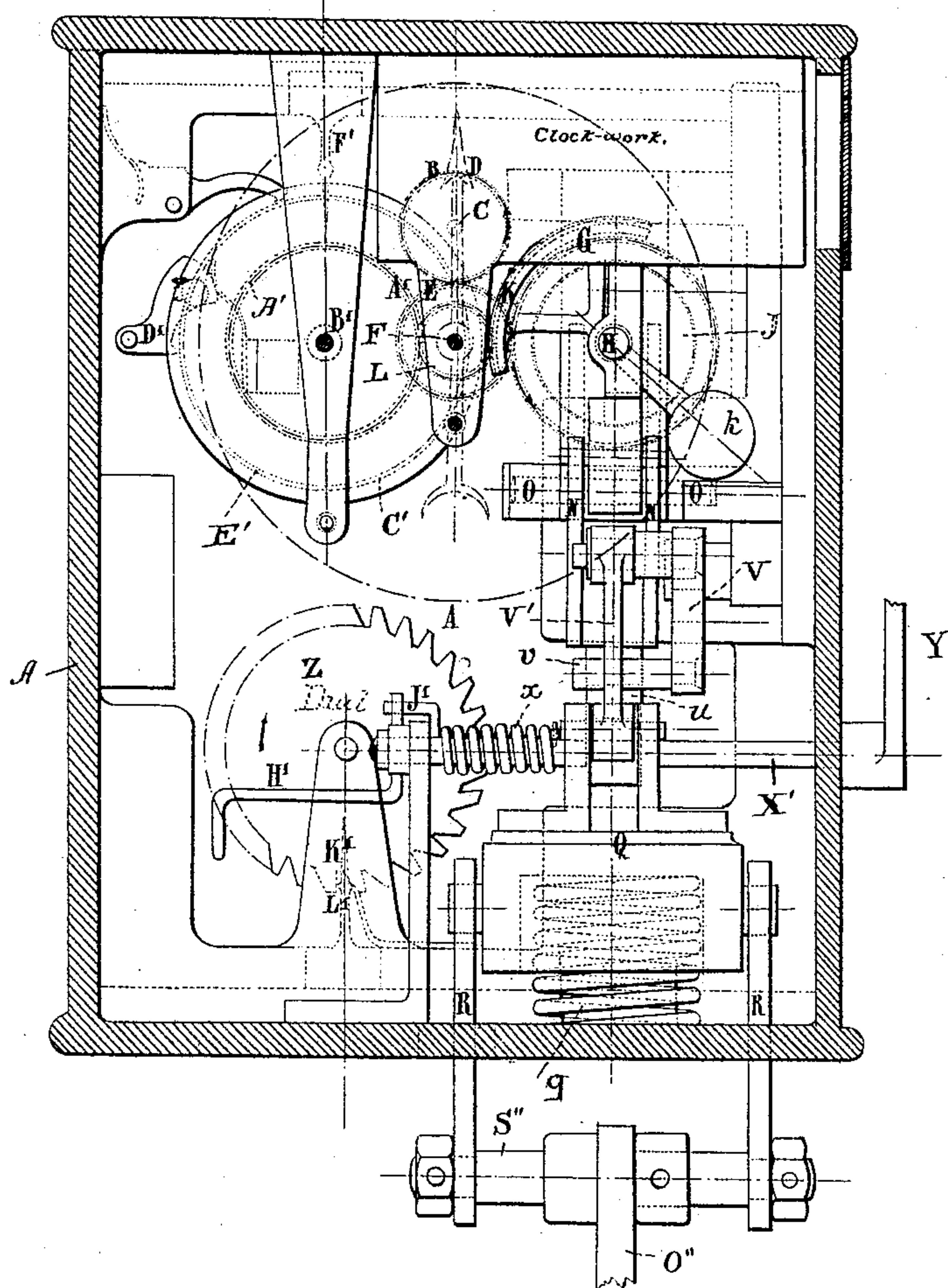
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Fig. 3.



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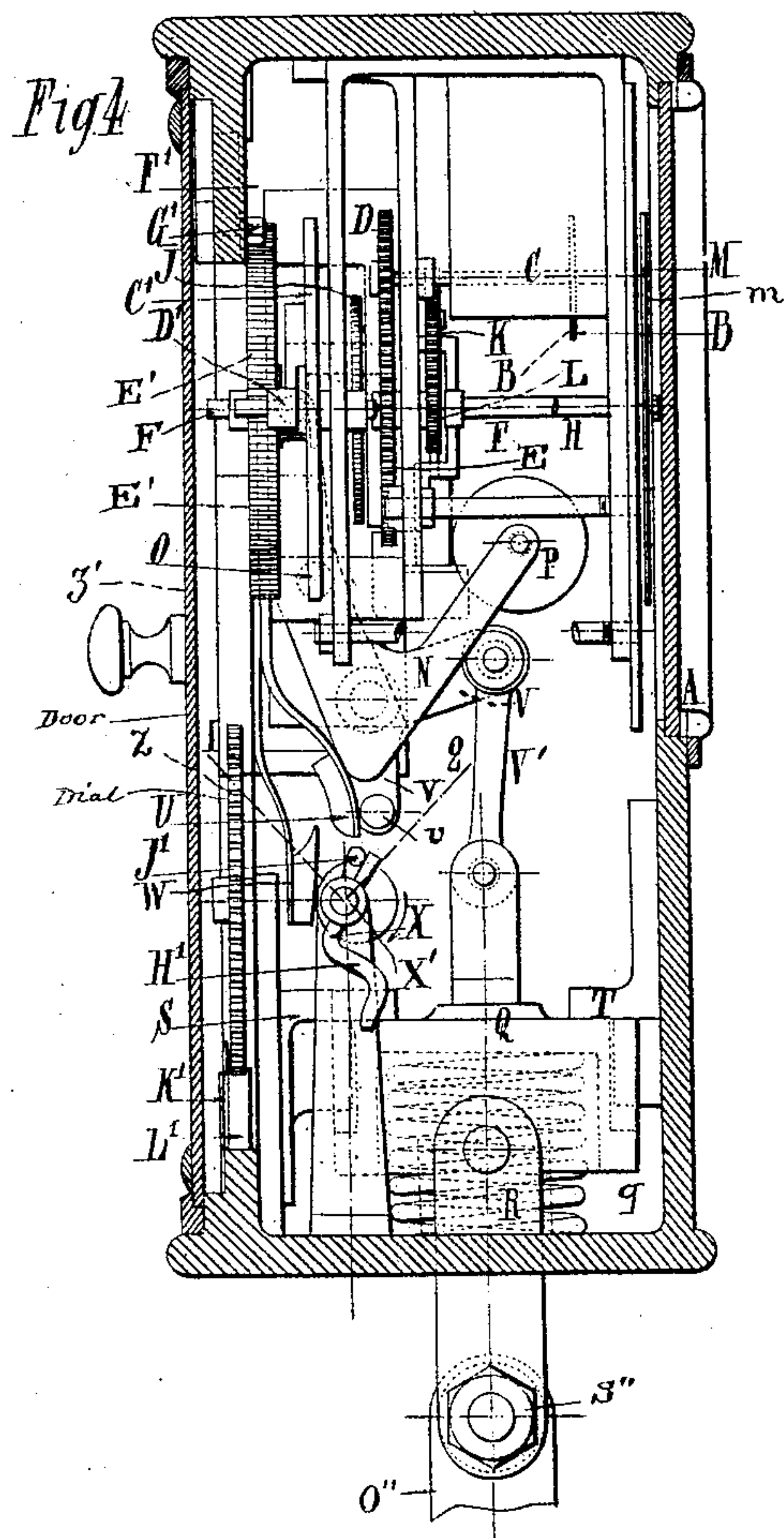
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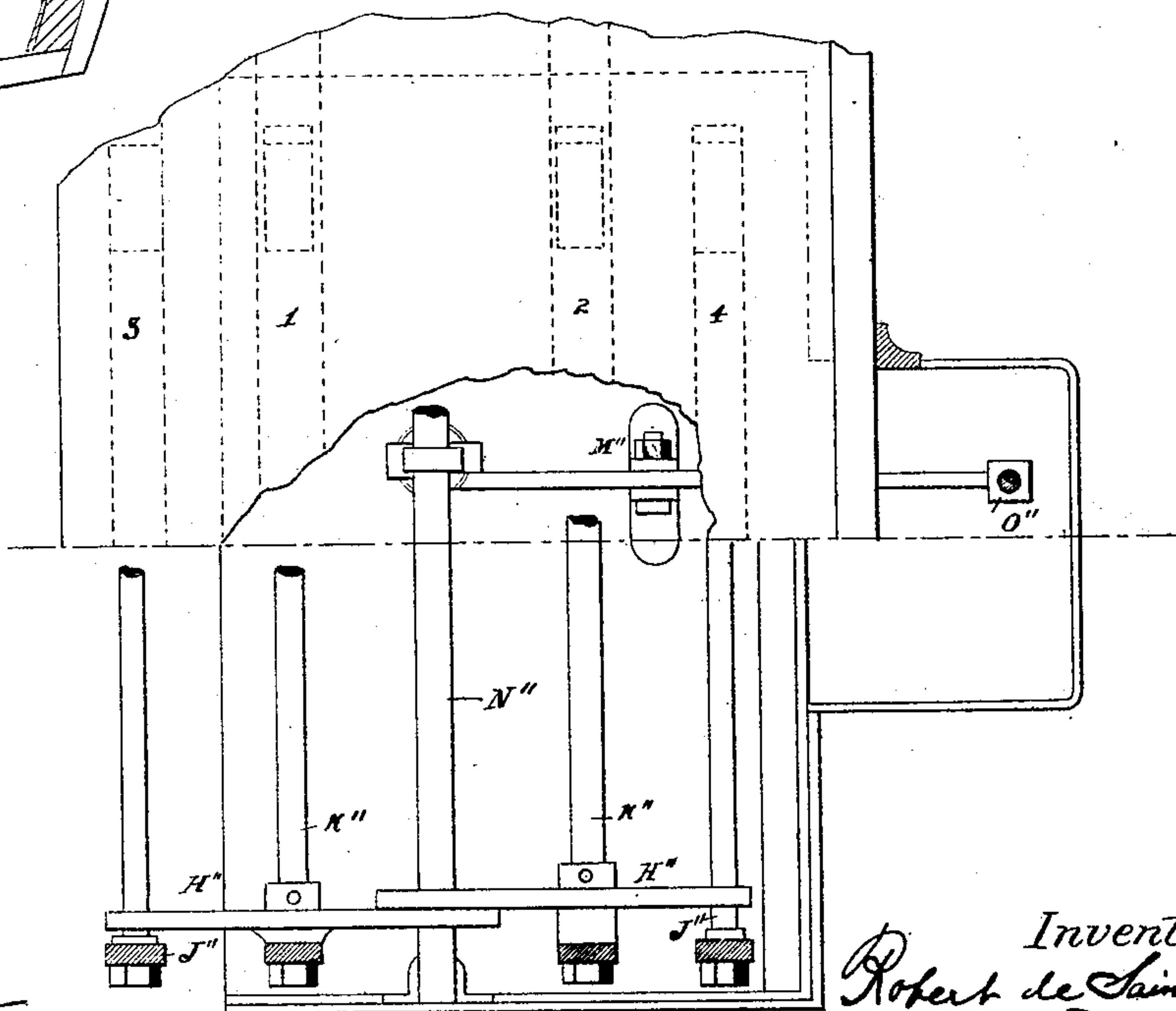
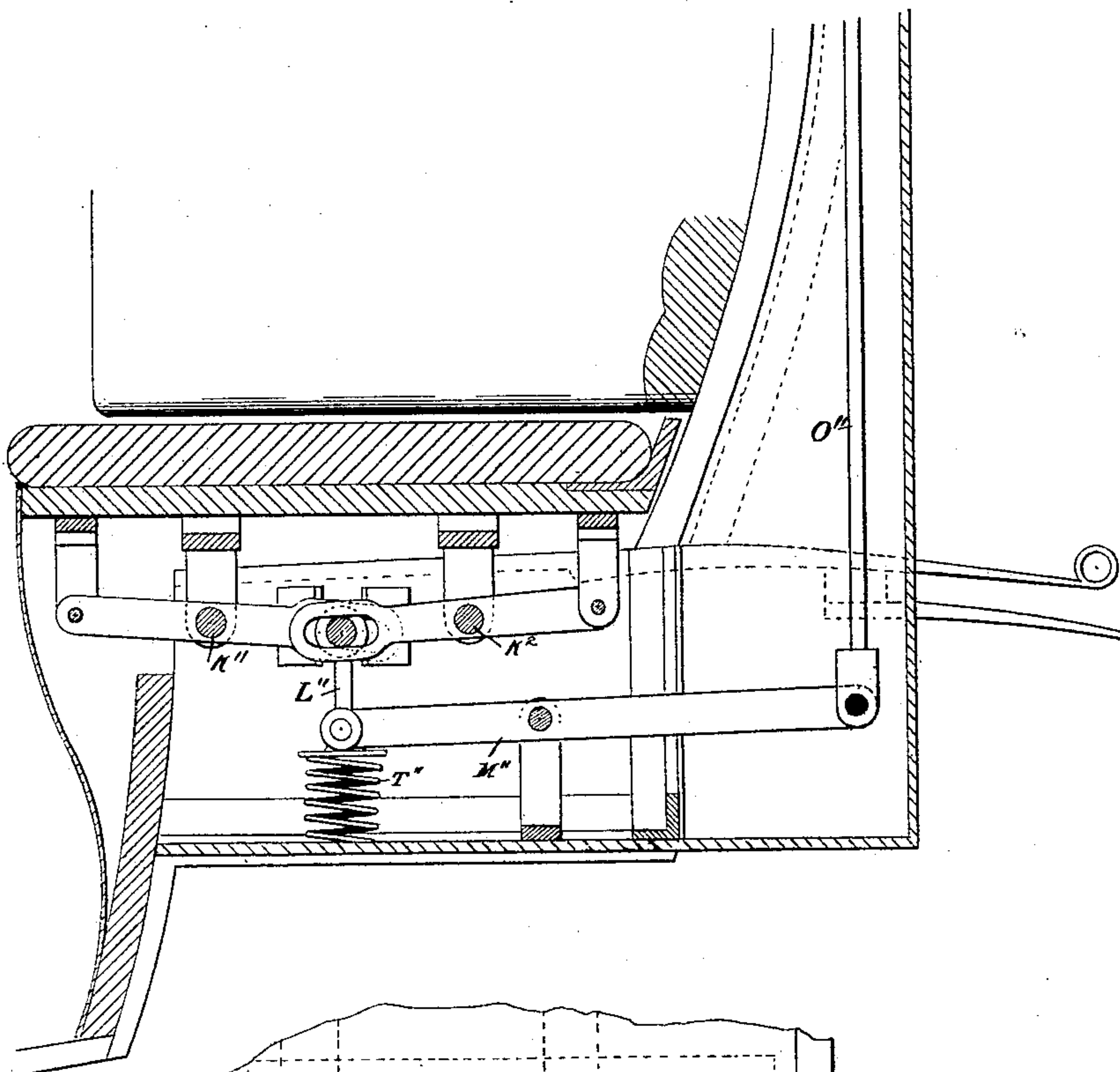
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Fig. 6.



Witnesses:
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Wm. Kortan

Fig. 7.

by

Inventor
Robert de Saint Marie
Pollard Maurer
his Attorneys.

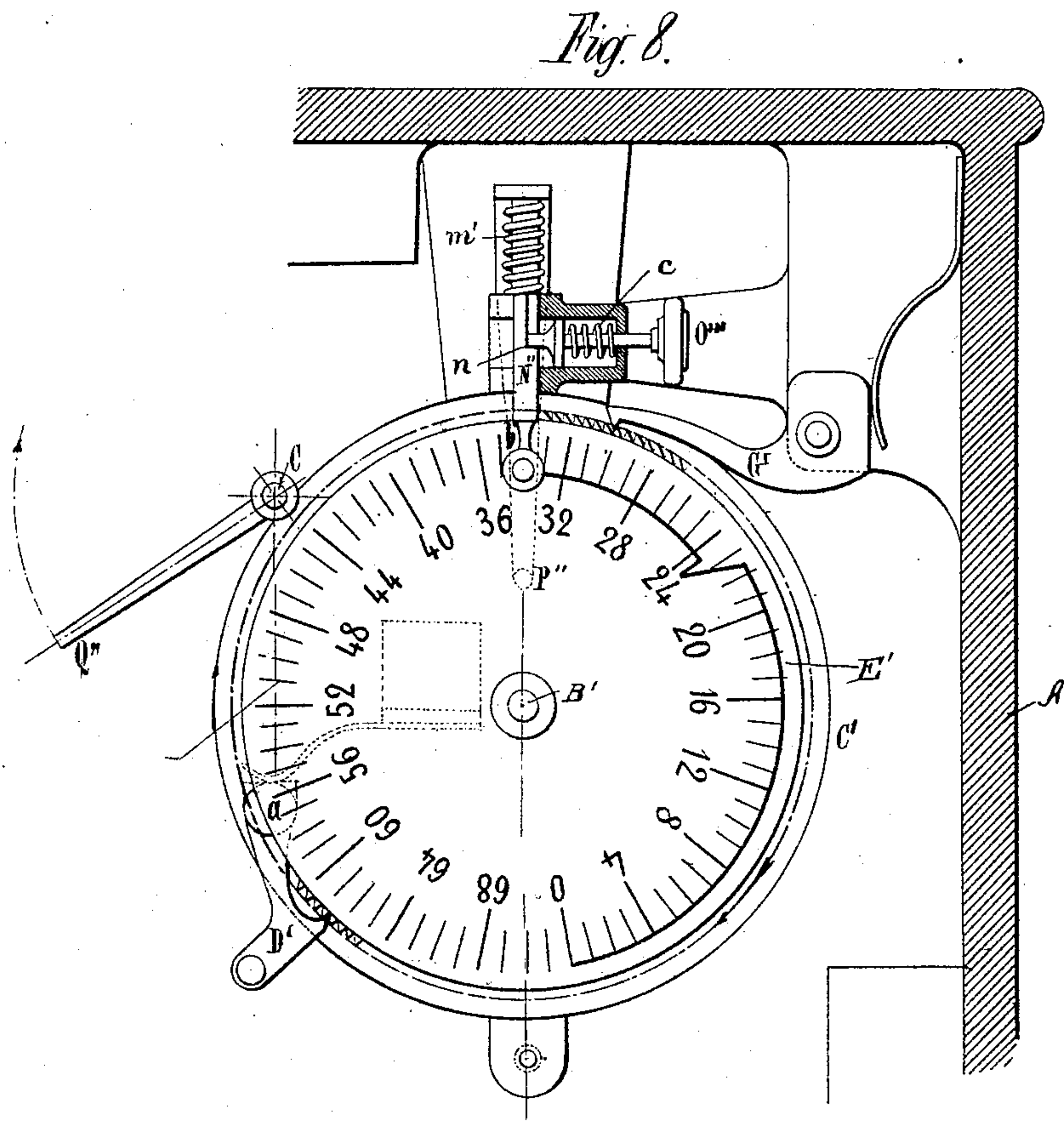
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UNITED STATES PATENT OFFICE.

ROBERT DE SAINTE-MARIE, OF PARIS, ASSIGNOR OF ONE-HALF TO BENOIT TRAYVON, OF LYONS, FRANCE.

FARE-REGISTER FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 452,123, dated May 12, 1891.

Application filed October 15, 1890. Serial No. 368,181. (No model.)

To all whom it may concern:

Be it known that I, ROBERT DE SAINTE-MARIE, a resident of Paris, in the Republic of France, have invented a new and useful Improvement in Automatic Fare-Registers for Vehicles, which improvement is fully set forth in the following specification.

This invention is designed for use in connection with a system of cabs or other street conveyances, such as is operated and controlled by a company in most cities, and is designed to keep an accurate registration of the total number of trips performed by each vehicle and the length of time during which each vehicle has been employed in the course of the day.

The apparatus hereinafter described is based on the establishment of a uniform rate per trip or per unit of time, (say a quarter-hour,) or on two different rates, the higher fare for the first quarter-hour and the lower or normal fare for each succeeding quarter-hour or other fraction of an hour taken as the time-unit.

The invention is designed to accomplish the following objects among others: first, the automatic account and registration independently of the driver of the time consumed in the transportation of passengers, whatever be the number carried, the speed of the vehicle, or the number of stoppages; second, protection against fraudulent manipulation on the part of the driver to the prejudice of his employers or of the passengers; third, the entire increment of receipts resulting from the collection of fares for trips and from the increase of the number of passengers, to whom the use of the apparatus assures the established fare, easily ascertainable by themselves, thus avoiding disagreeable discussion and disputes with the driver; fourth, avoidance of the necessity for road-inspectors as employed in some cities, whether the fare be fixed by the trip, whatever the distance, or be variable according to distance or time.

The apparatus comprises a dial placed in view of the passenger, and which may be illuminated at night, indicating exactly the number of quarter-hours (or other time-unit) consumed during his trip. A second dial, concealed from view within the locked case of the

apparatus, registers the total number of quarter-hours for which the driver has been paid during the day. This dial may be called the "time-computing" dial. The registering mechanism is set in operation by the entrance of a passenger or passengers into the vehicle, and continues to run, registering the lapse of each quarter-hour, until the driver actuates, by means under his control, a setting device, which restores the individual-trip indicator to zero and disengages the registering mechanism from the driving mechanism. This stopping and setting device cannot, however, be actuated so long as there is an occupant in the vehicle. On the other hand, it is to the interest of the driver to arrest the registering mechanism as soon as he has been paid, which insures an accurate registration. Should there be one or more stoppages in the course of a trip, and should the driver attempt at such time to set the trip-indicator back and arrest the registering mechanism, with a view to obtaining from the passenger an amount in excess of that which the computing-dial or totalizer would indicate, he would not be likely to derive any advantage therefrom, for the movement of the hand back to zero would at once indicate a fraudulent maneuver to the passenger. However, the latter would have the right to insist that his payment should be according to this indicator, so that there would be a discrepancy between the fares collected and the computing-dial, which is always concealed from the driver. Finally a registration of the total number of trips is made by a third dial, also concealed. This dial advances one step each time the driver sets back the trip-indicator to zero. Consequently any irregular manipulation would mark another trip, and if an increased rate be charged for the first period of each trip the maneuver would be to the prejudice of the driver.

The apparatus is not affected by the jolting of the vehicle. It is uniform in operation whether one or more persons occupy seats in the vehicle. It prevents the drivers from occupying the seats when the conveyance is not in use, though they can shelter themselves by taking seats on the floor.

In the accompanying drawings, which form part of this specification, Figure 1 is a side

view of a cab, showing the general arrangement of the apparatus. Fig. 2 shows the exterior of the box containing the mechanism. Fig. 3 is an inside view, the front being removed. Fig. 4 is an interior side elevation. Fig. 5 is a plan view, the top being removed. Fig. 6 is a vertical section of the seat and mechanism connected therewith. Fig. 7 shows the same mechanism in plan, part of the seat being broken away; and Fig. 8 is a front view of the time-computing dial provided with mechanism for distinguishing between day and night service.

The registering mechanism is inclosed in a small box A, securely locked and mounted in any convenient place in the vehicle, the dial M, with its pointer or hand *m*, being exposed to the passenger, but protected from tampering by a glass plate. In this box is a spring-motor or clock-work constituting the driving mechanism, the details of which are for the sake of clearness omitted from the drawings. The last wheel of the train engages and drives a wheel B, mounted on an arbor C, which also carries a wheel D. The latter engages a wheel E, which is loose on the arbor F and engages the wheel G, which is loose on the shaft H. These wheels being connected with the driving mechanism are in constant motion. Shaft H, however, and the parts connected with it, through which motion is communicated to the registering mechanism, should only move while the vehicle is in use. To this end the rim of wheel G has a series of teeth on the inside as well as on the outside, and adjacent to wheel G on shaft H is a wheel J, fast on the shaft, which, when said shaft is shifted lengthwise, as hereinafter explained, will come into engagement with the inner row of teeth on wheel G, whereupon shaft H will begin to rotate. This is a common form of mechanism for engaging and disengaging gears, and any ordinary or suitable clutch mechanism may be substituted therefor.

Shaft H carries a toothed sector K, and is provided with a counter-weight *k*, which returns the shaft and the parts connected therewith to their normal positions when the wheel J is disengaged from wheel G. Of course the wheel G and sector K must be held stationary when shaft H is shifted. Means for that purpose, being common and well known, need no description.

Sector K communicates the motion of shaft H, when the latter moves, to a pinion L, which is fast on the arbor F, already referred to, and upon which the intermediate wheel E turns loosely. This arbor F carries the hand *m* of the trip-indicator dial M, whose face is divided into, say, twenty-four principal divisions, each indicating a quarter-hour, though any other time-unit may be taken. Each quarter-hour space is subdivided by points into three equal divisions, each indicating five minutes.

Beneath the train of wheels just described

is an elbow-lever N, pivoted at O. Its upper end is forked, (see Fig. 3,) and these branches rest against the side of wheel J. At its opposite end lever N carries a counter-weight P, whose tendency is to press wheel J into engagement with wheel G and thus start the registering mechanism; but normally such movement is prevented by the pressure of a stiff spring U, Fig. 4, which bears against the elbow of lever N. Spring U also bears against a pin *v*, projecting from one end of another elbow-lever V, whose other end is connected with a box Q by a connecting-rod V'. Box Q is guided by guides S T, which also serve as stops to limit its upward movement. It will be observed that when through the action of connecting-rods R box Q is drawn downward against the pressure of the coiled spring *q* the lever V is tilted and forces spring U away from lever N. The latter thereupon tilts under the weight P, throwing wheel J into engagement with wheel G, thereby connecting the indicator with the driving mechanism. The connecting-rods R, which actuate the sliding box Q, are connected with starting mechanism under the seat of the vehicle, as hereinafter described, insuring that the register will continue to operate so long as the seat is occupied. Spring *q* compensates for the play in the connecting devices. When it is so far compressed that box Q rests on the bottom of the case, the positions of the parts at that time will not be changed by additional weight on the seat. When spring U is forced back, as just described, it will be caught and held by a spring-latch W, so that should the passenger alight during the course of a trip, or rise from his seat for any reason, the registering mechanism will not be thrown out of gear. When the driver is paid, however, he must at once in his own interest disengage the registering mechanism by devices put under his control for that purpose. Cam X, mounted on shaft X', Fig. 4, can be turned by the driver by means of an arm Y, Fig. 3, to which a button, handle, or similar contrivance within the driver's reach is connected. By turning this cam in the direction of the arrow, Fig. 4, spring-catch W is detached from spring U, which now returns to its normal position, tipping back lever N and disengaging the registering mechanism. Weight *k* immediately returns hand *m* to zero. Should the driver attempt by his releasing device to hold the spring-catch W away from U, the effect would be that the moment the passenger alighted for an incidental stoppage the hand *m* would go back to zero, and the registration of a new trip on the visible dial would begin on his re-entering the vehicle.

The operation of the computing-dial will now be explained. Pinion L gears with a wheel A', Figs. 3 and 5, fixed on an arbor B', which carries near its rear end a disk C'. This disk, by means of a dog or pawl D', carries around with it the toothed disk E'. This latter forms the time-computing dial, its in-

ner face being graduated into, say, seventy-two divisions, each representing a quarter of an hour. (See Fig. 8.) This dial has a fixed pointer or needle F' , (see Fig. 3,) by which its indications can be read. The reverse movement of shaft B' when pointer m returns to zero does not reverse dial E' , which is held by detent G' , Fig. 8. This detent may be regulated to act for any desired fraction of time.

To register the total number of trips during the day I provide a small dial Z near the bottom of the case, its edge being indented with notches of the shape shown in Fig. 3. On the end of the shaft X' , which carries the setting-cam X , is a bent pin J' , which is adapted to strike and rotate the pivoted arm H' each time the cam-shaft X is turned by the driver to set the trip-indicator. When the cam turns from position 1 to position 2, Fig. 4, the bent end of arm H' acts against the inclined teeth of disk Z and turns it one step. The motion of the disk is accurately determined by a spring L' . Disk Z may be marked on its inner face (left, Fig. 4) with, say, thirty divisions, and the number of trips performed can be read by a stationary pointer K' . (See Figs. 3 and 4.) The use of this third dial is necessary in case the tariff established calls for a higher rate of fare for the first period (quarter-hour) of a trip. It also serves as an additional precaution against any attempt at fraudulent manipulation, as already pointed out.

Each evening when the vehicle is returned the inspector or agent will unlock and open the door at Z' , Fig. 5, and read the indications of the time-computing-dial E' and trip-computing dial Z . He will determine the receipts by noting the figures of the dial Z as the value of so many initial or high-rate fares, and the figures of the computing-dial E' , less those of the trip-dial Z , as the value of so many ordinary or low-rate fares. Finally, he will wind the clock-work and restore the two dials to zero.

The mechanism for starting the registering devices into operation is shown in Figs. 6 and 7. It comprises a system of levers H'' , pivoted on axes k'' . These levers connect at one end with brackets J'' , depending from the seat, and at the other with a bar M'' . A link L'' connects the latter with a lever M'' , whose movement is transmitted by a connection-rod O'' to the cross-bar S'' , Fig. 3, with which the connection-rods R , already described, are connected. Thus the passenger on taking his seat couples the driving mechanism with the registering mechanism. Beneath the end of lever M'' is a powerful spring T'' , whose office is to return the seat and the other parts when the passenger arises. The resistance to be overcome may conveniently be so computed that a weight of twenty-five kilos and upward will be sufficient to start the apparatus. It is obvious that in case the vehicle has more than one

seat each must be provided with starting mechanism such as described.

For the purpose of indicating the time of day and night service, respectively, the arrangement illustrated in Fig. 8, which I term the "horograph," may be adopted. In this case the time-computing dial E' may have its face prepared to receive pencil-marks, which can be easily sponged off, or graduated paper disks, easily replaced, may be used. This is marked with the divisions, as shown and as already described. The fixed hand F' , Fig. 3, is now replaced by a rod N'' , (see Fig. 8,) adapted to hold a pencil against the face of the disk E' , a spring m' being coiled around the shank of rod N'' and normally holding the pencil near the edge of the disk, we will say, during the period of the day service. In this position the pencil would draw the section of the heavy line from 0 to 24 on Fig. 8. Depending from rod N'' is a bar or arm provided at the end with a pin P'' . (Shown in dotted lines.) This pin is in the path of an arm Q'' , fixed on the arbor C of the clock mechanism and in constant rotation. When the end of arm Q'' comes in contact with pin P'' , it draws the rod N'' down, compressing spring m' . When the arm Q'' passes pin P'' , spring m' tends to draw the rod and its pencil upward; but this movement is arrested by the point of pin O''' entering a notch n in the shank of rod N'' , said pin O''' being moved into the notch by the spring c . Arbor C makes one revolution in twenty-four hours, and arm Q'' is so disposed thereon that it will actuate pin P'' at the predetermined point between the day and night service. This is supposed to have occurred at the point 24, and thereafter the pencil draws a line nearer to the center of the disk, the break being clearly indicated by the angle at that point. Of course the outer line could be taken to indicate the night service, the apparatus being properly arranged. The arrangement will depend upon whether the vehicle begins its service in the morning or in the evening.

It will be seen that this apparatus provides for the registration of a system of fares which comprises four different rates, namely: first, an initial-trip rate by day; second, a normal or lower rate for continued trips by day; third, an initial-trip rate by night, and, fourth, a normal or lower rate by night.

The arrangement of the dog D' and detent G' , as shown in Fig. 8, is somewhat modified with reference to the devices shown in the other figures in order to render their application to the horograph more easy. For the same reason the time-computing dial (seen edgewise in Fig. 4) is set farther back, giving space between it and the door Z' for the play of the pencil-carrier. The maximum movement of the pawl or dog D' is represented by the distance between the points a and b , Fig. 8—that is to say, the pawl D' will move over this arc in case of a complete revolution of the hand m of the trip-indicator.

It is obvious that other means than those described could be adopted to trip the pencil-holder at the proper moment to indicate the change from day to night service, and that other modifications could be made in details of construction without departing from the spirit of the invention.

Having now fully described my said invention, what I claim is—

1. The combination of continuously-operating driving mechanism, such as clock-work, a visible trip-indicating dial with its hand normally disconnected from said driving mechanism, said dial being graduated to indicate the duration of trips in time-units, a concealed time-computing dial geared to said trip-indicating device, starting mechanism for engaging the driving mechanism with the registering mechanism, said starting mechanism being connected with the seat of the vehicle, so as to maintain such engagement so long as the vehicle is occupied, and stopping and setting mechanism, under the control of the driver when the seat is unoccupied, for disengaging the registering mechanism and simultaneously returning the trip-indicator to zero, substantially as described.

2. The combination of the trip-indicator, the computing time-dial connected therewith, the computing trip-dial, driving mechanism, such as clock-work, starting mechanism connected with and actuated by the seat of the vehicle, and setting mechanism under control of the driver when the seat is unoccupied, substantially as described.

3. In a fare-register for vehicles, the combination of a visible trip-indicator adapted to indicate the duration of trips in time-units, the concealed computing-dial for preserving the total of trips performed, driving mechanism normally out of engagement with the

registering mechanism, means for connecting the two upon the occupation of the vehicle by a passenger, and setting mechanism under control of the driver when the vehicle is unoccupied, substantially as described.

4. In a fare-register for vehicles, the combination, with the graduated time-computing dial and the clock-work for driving the same, and with starting and stopping mechanism, of the pencil or marker adapted to trace a line on the face of said disk, a movable holder or support therefor, and a shifter-arm or device carried by an arbor of the clock-train for shifting said holder or support at a predetermined moment radially with respect to said dial, substantially as described.

5. The combination of the visible trip-indicator, a clock-train for driving the same, a time-computing dial geared with the trip-indicator, a marker and support movable radially with respect to said dial, and means actuated by said clock-train for shifting said support and marker at a predetermined moment, substantially as described.

6. The combination, with the driving mechanism, trip-indicator, and time-computing dial, and with means, such as a cam and connections, under control of the driver, for stopping the registering devices and setting the trip-indicator at zero, of a trip-computing dial and devices, as specified, for moving the same one step each time the stopping and starting mechanism is operated, substantially as described.

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

ROBERT DE SAINTE-MARIE.

Witnesses:

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R. J. PRESTON.