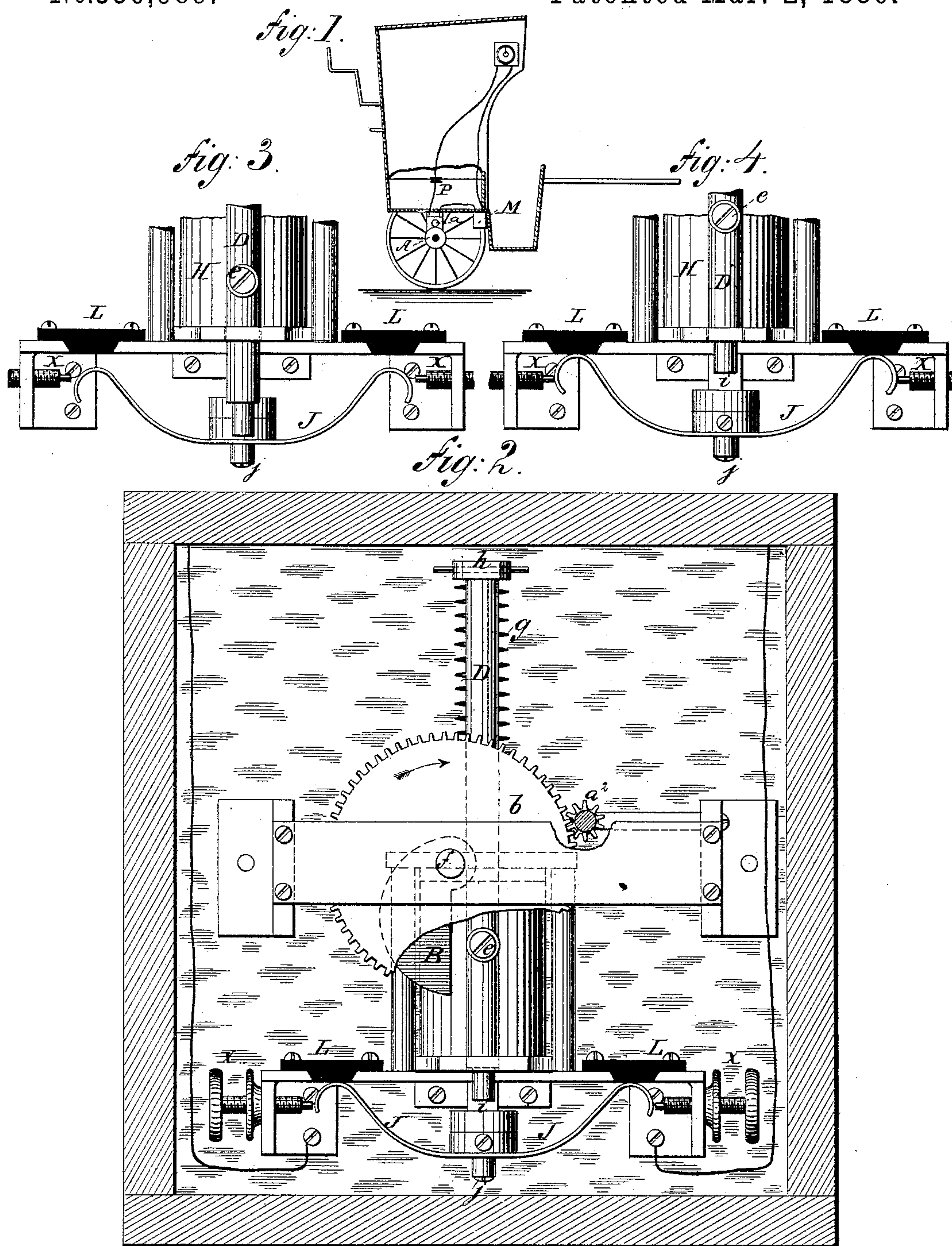


E. S. BROWNSON.

DISTANCE REGISTERING DEVICE FOR WHEELED VEHICLES.

No. 336,989.

Patented Mar. 2, 1886.



WITNESSES:

*A. Schehl.*

*John M. Speer.*

INVENTOR

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BY *Brisen & Steele*

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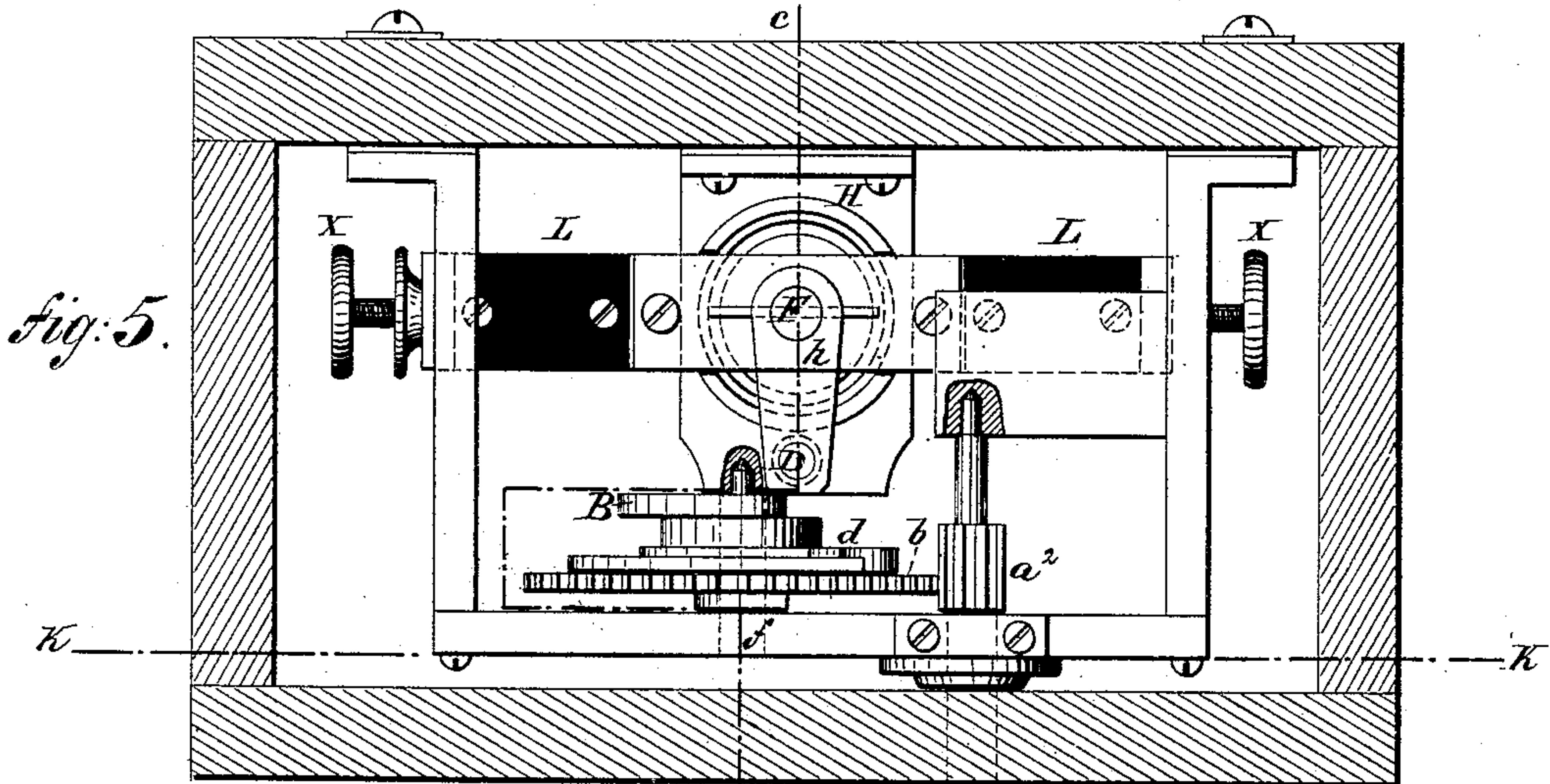


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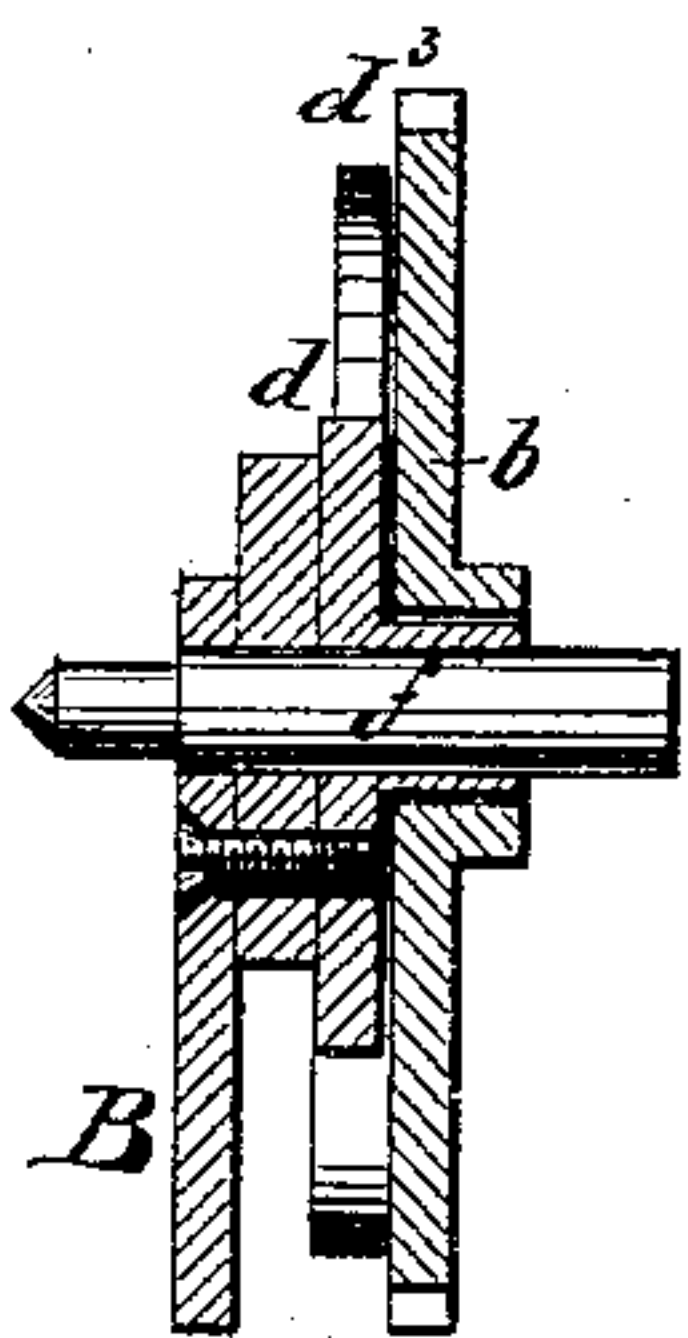
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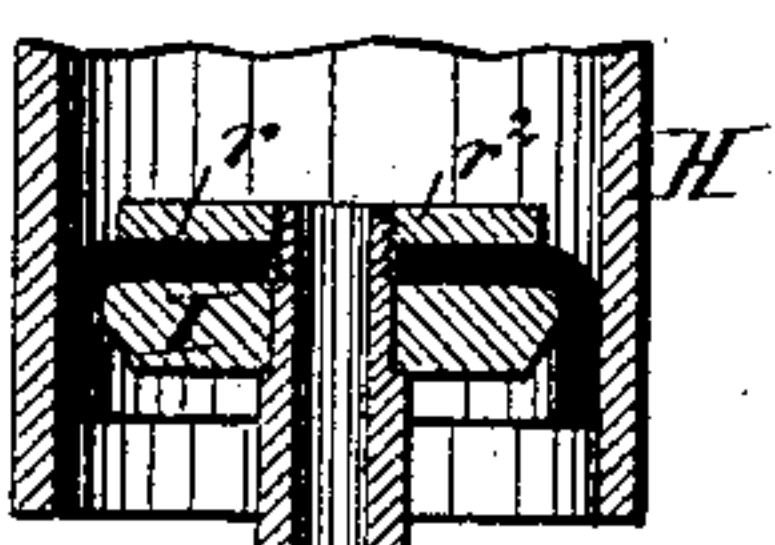
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*Fig. 8.*



*Fig. 9.*



*Fig. 10.*

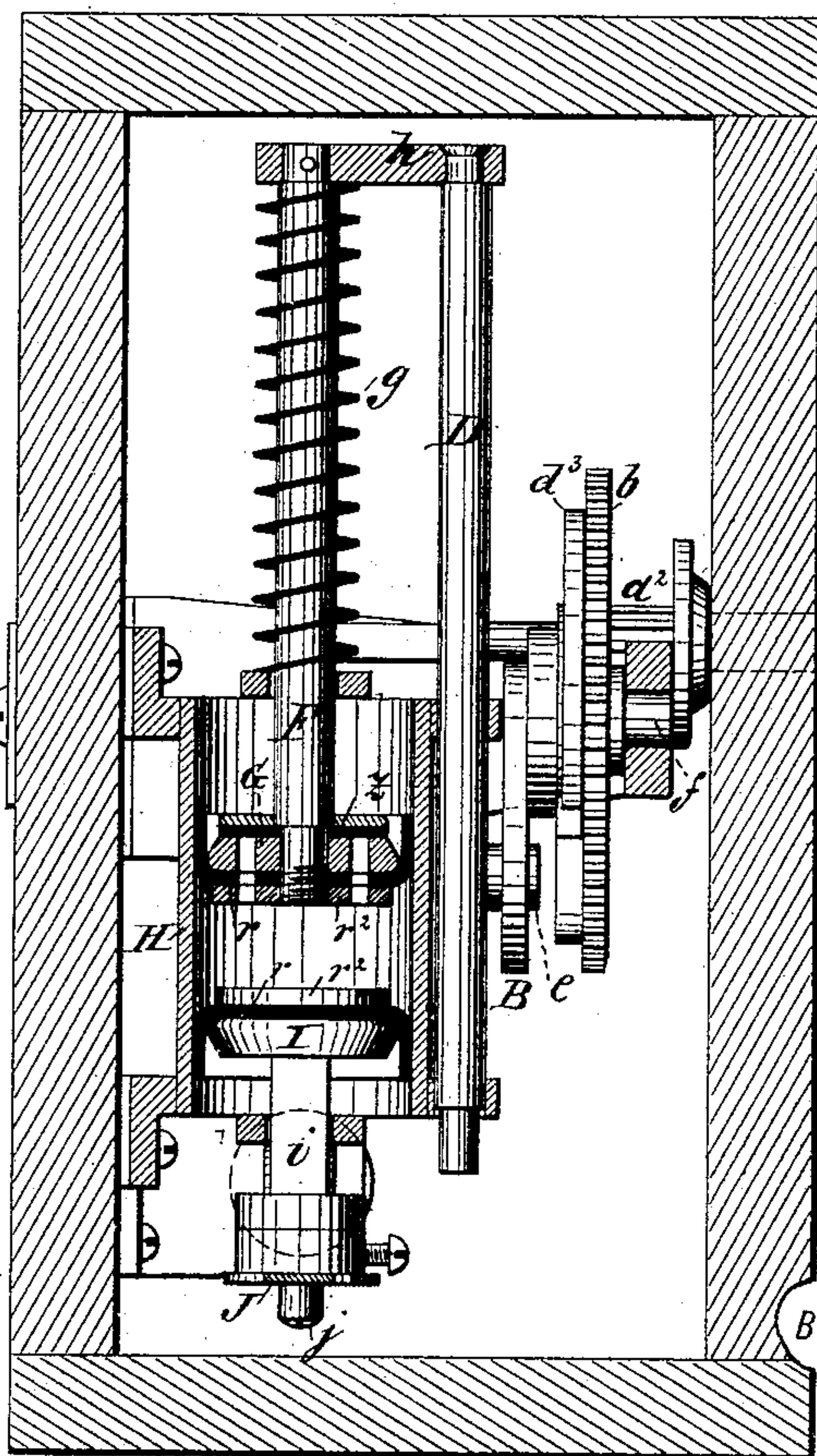


WITNESSES:

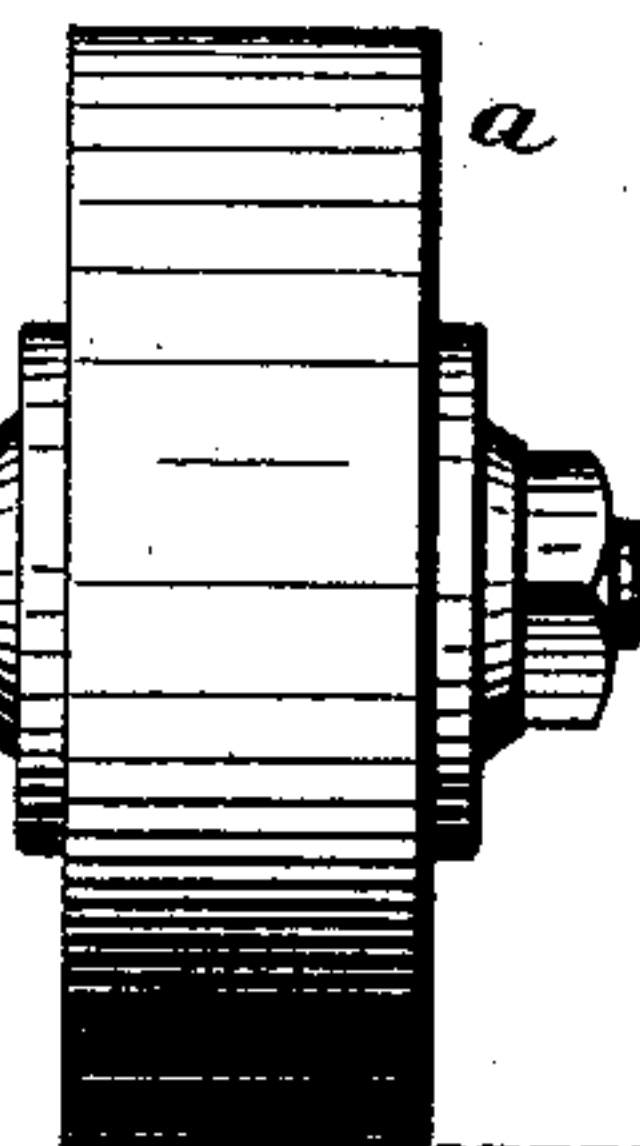
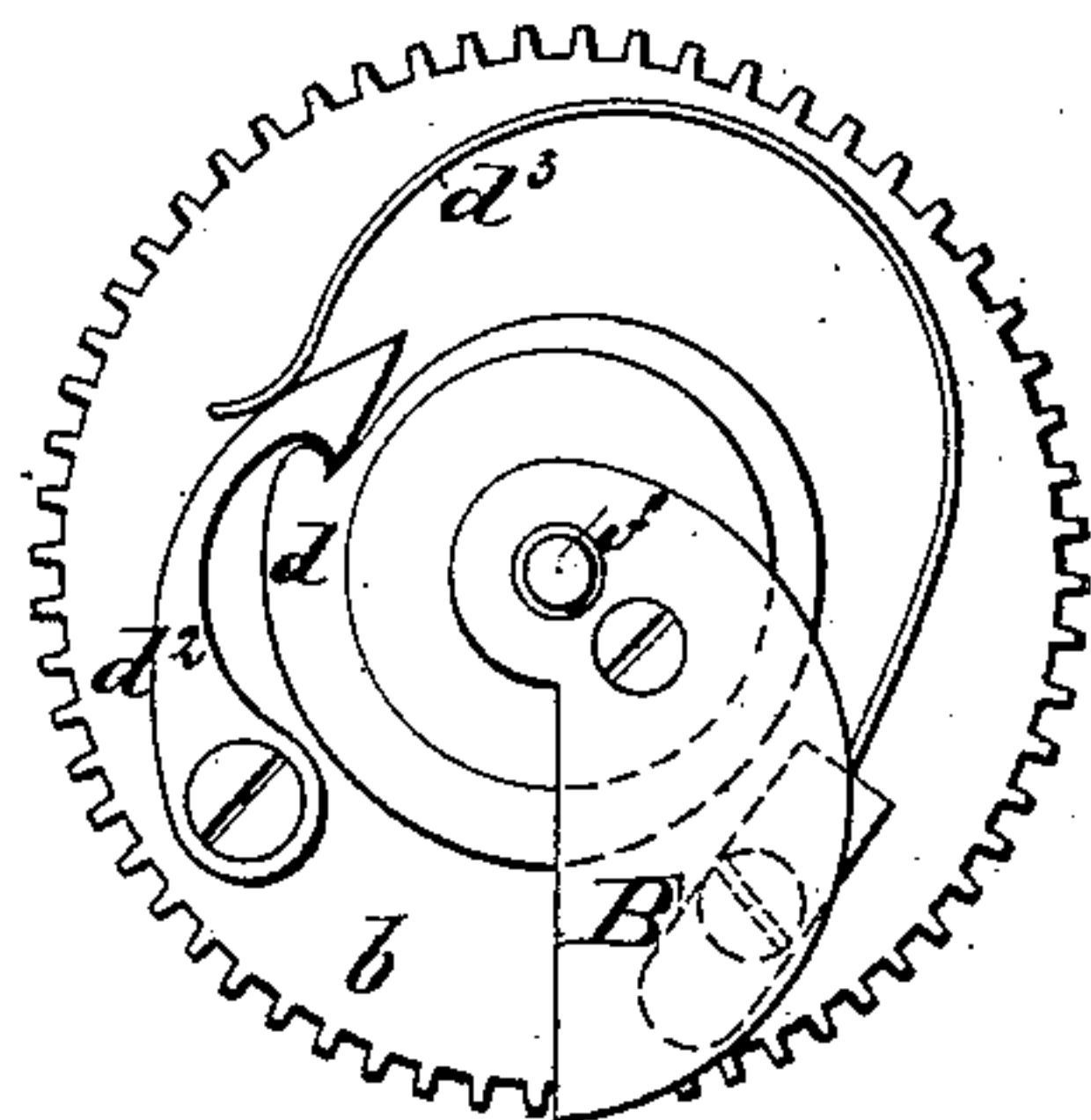
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*Fig. 6.*



*Fig. 7.*



*A*

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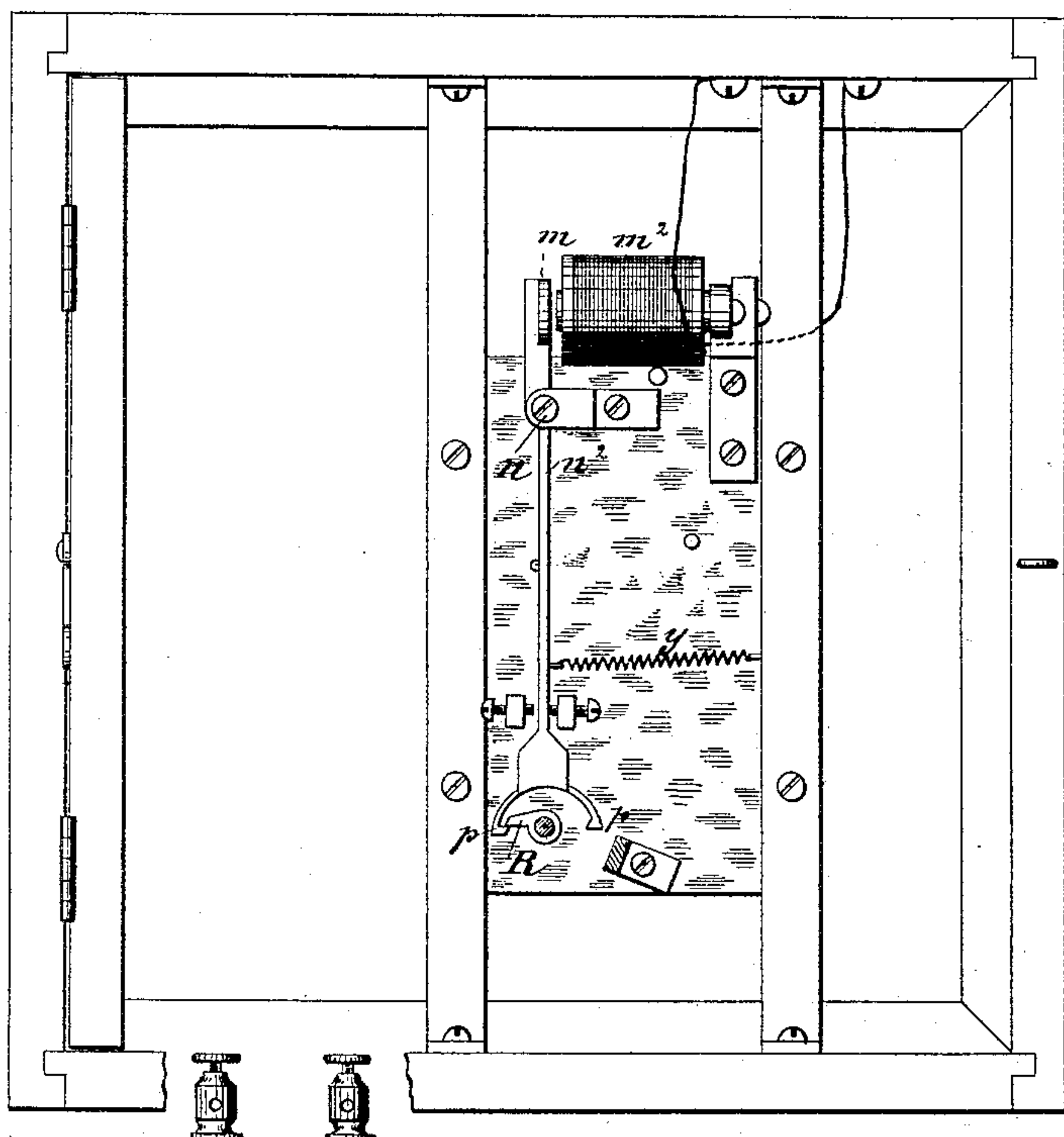
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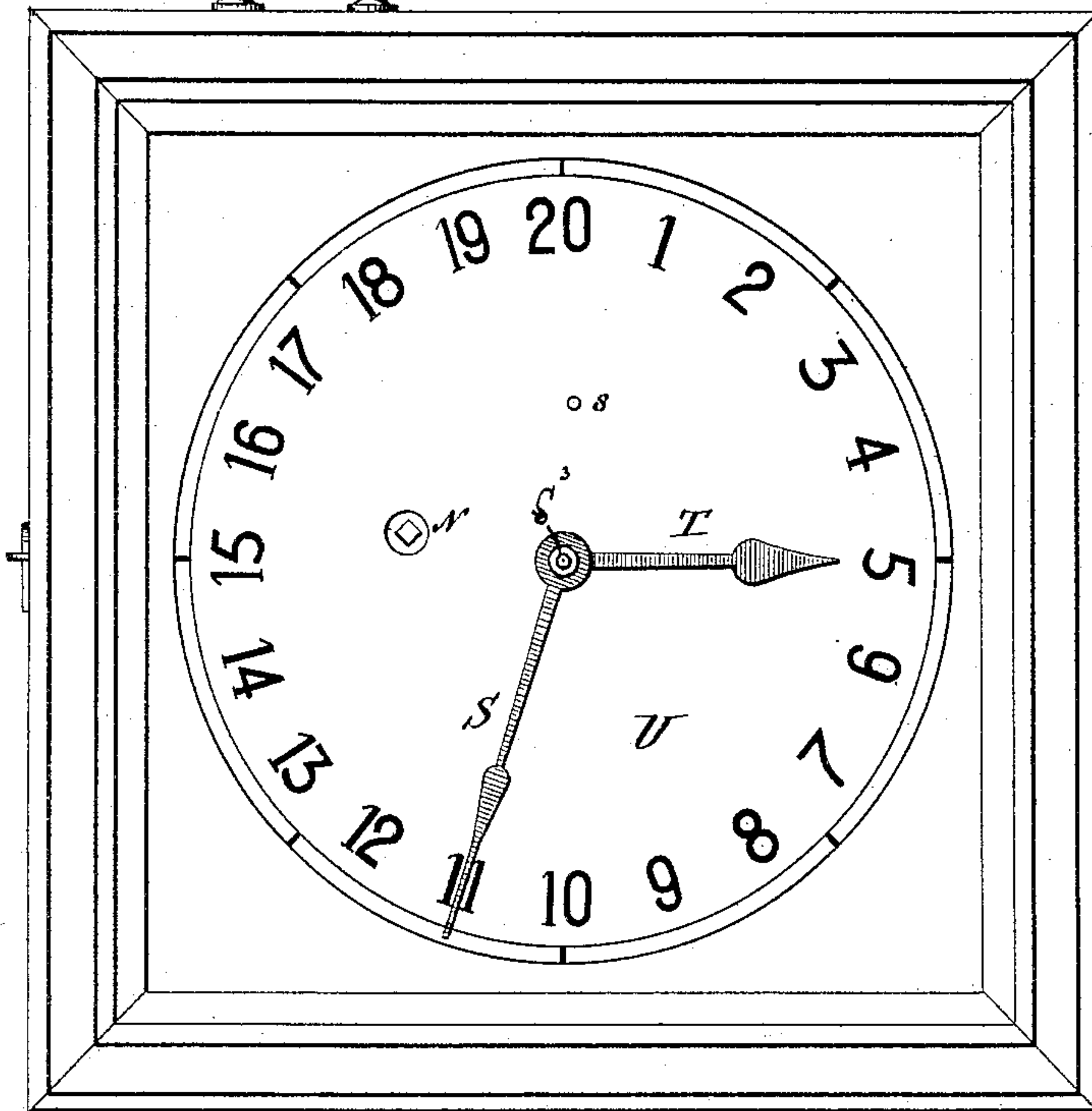
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*Fig. 11.*



*Fig. 12.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EDWARD S. BROWNSON, OF BROOKLYN, NEW YORK.

## DISTANCE-REGISTERING DEVICE FOR WHEELED VEHICLES.

SPECIFICATION forming part of Letters Patent No. 336,989, dated March 2, 1886.

Application filed June 18, 1885. Serial No. 169,139. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD S. BROWNSON, a resident of Brooklyn, in the county of Kings and State of New York, have invented an Improved Distance-Registering Device for Wheeled Vehicles, of which the following is a full, clear, and exact description, reference being made to the accompanying drawings, in which—

10 Figure 1 is a vertical section of a cab containing my improved registering device. Fig. 2 is a face view, partly in section, of the circuit-controlling device of the same, the plane of section being indicated by the line *k k*,  
15 Fig. 5. Figs. 3 and 4 are detail views of a part of the circuit-controlling device. Fig. 5 is a top view, partly in section, of said circuit-controlling device. Fig. 6 is a vertical cross-section of the same on the line *c c*, Fig.  
20 5. Fig. 7 is a detail face view of part of the same. Fig. 8 is a central vertical section of Fig. 7. Fig. 9 is a vertical section of part of said circuit-controlling device. Fig. 10 is a horizontal section on the line *O O*, Fig. 9.  
25 Fig. 11 is a back view of the registering device. Fig. 12 is a face view of the same.

This invention relates to improvements in registering devices in which the revolution of the wheel of the carriage, by the aid of a circuit-controlling mechanism, is made to alternately make and break an electric circuit which actuates the registering device whenever the carriage is going forward and is occupied by a passenger.

35 In the drawings, the letter *A* represents the hub of the wheel of the carriage. A small wheel, *a*, which may be made of rubber or analogous substance, bears upon the periphery of this hub *A*, or is otherwise revolved by it.  
40 The arbor of this wheel *a* carries a pinion, *a*<sup>2</sup>, which meshes into a gear-wheel, *b*, whose shaft *f* carries a pawl and ratchet-wheel *d*, and also a cam, *B*, which is clearly shown in Figs. 7 and 8. The object of the pawl and ratchet-wheel *d* is to prevent the registering device  
45 from working while the carriage is going backward.

In the drawings the cog-wheel *b* is supposed to be hung upon the shaft *f* in such a manner  
50 as to revolve loosely upon the same, while the cam *B* and ratchet-wheel *d* are rigidly secured to said shaft *f* in a proper manner. This ar-

rangement may, however, be changed, and the cog-wheel *b* may be secured to the shaft and the cam *B* and ratchet-wheel *d* loose upon the same. The pawl *d*<sup>2</sup> is secured to the wheel *b*, and is pressed against the ratchet-wheel *d* by a spring, *d*<sup>3</sup>, that is secured to the cog-wheel *b*.

When the carriage moves forward, the wheel *b* is revolved in the direction shown by the arrow in Fig. 2, and the pawl *d*<sup>2</sup> carries the ratchet-wheel, and consequently the cam *B*, around; but when the carriage is going backward this pawl slips loosely on the ratchet-wheel, thus not carrying it around, nor the  
65 cam *B*.

Whenever the cam *B* is revolved, it encounters a pin or projection, *e*, on a rod, *D*, which projection the said cam presses downward against the action of a spiral spring, *g*,  
70 which is mounted on a rod, *F*, that is rigidly connected to the rod *D* by a yoke, *h*. After the cam *B* passes the pin *e* the rods *D* and *F* are suddenly raised by the spring *g*. The rod *F* carries a perforated piston, *G*, which is  
75 provided with a weighted valve, *z*, (said valve opening upward.) The piston *G* works in a cylinder, *H*. The cylinder *H* has below the piston *G* another piston, *I*, whose rod *i* is hollow, so as to allow of the passage of air through  
80 the same.

The packing *r* of the upper piston, *G*, extends upward, and that of the lower piston downward, as shown. The packings *r* of these pistons are made of leather or analogous substance, and are secured to the pistons by washers *r*<sup>2</sup>. These washers *r*<sup>2</sup> have a smaller diameter than the pistons, so that when the upper piston is raised and when the lower piston is lowered part of the packings *r* is  
85 wedged between the washers *r*<sup>2</sup> and the wall of the cylinder, thus making a perfectly airtight packing; but when said pistons move in the opposite directions to those above stated the said packings lie loosely around said  
90 pistons and allow them to move more freely; but they do not then make as perfectly airtight a packing as when they are wedged between the washers *r*<sup>2</sup> and the wall of the cylinder. A perfect packing is not necessary  
100 when the piston *G* is depressed, as will be seen hereinafter. By means of a screw, *j*, which has a tapering head and flattened faces, as shown in Figs. 9 and 10, the amount of air



which passes through the hollow rod *i* may be regulated. The lower portion of piston I carries a flexible metallic cross-piece, J.

X X are screws that are connected by wires to a battery, M, Fig. 1, and that are insulated from the rest of the apparatus and from each other by pieces of insulating material L, that are set in the metallic frame of the apparatus.

As the piston G descends by the action of the cam B and pin *e*, its valve *z* rises and permits the air contained in the cylinder between the two pistons to escape until said piston G presses against the piston I and pushes the same downward; but when the pin *e* is relieved from the pressure of the cam B the spring *g* suddenly raises the piston G, and thus rarefies the air in the cylinder H, contained between the pistons G and I, and the pressure of the external atmosphere tending to overcome this rarefaction, by exerting its pressure upon the bottom of piston I presses the same upward quickly and with considerable force. The screw *j* is adjusted so as not to allow enough air to pass through the hollow rod *i* to at once overcome the rarefaction in the cylinder before the flexible cross-piece J has made a contact between the screws X. The upward motion of the piston I continues after the flexible cross-piece J is stopped in its upward motion by the pieces of insulating material L, (see Fig. 4,) and the ends of said flexible cross-piece are consequently expanded longitudinally and touch the screws X, making an electrical connection between them, and thus closing the circuit. It will be seen that in this manner alternate electric currents are produced in the wires leading from the screws X X.

Fig. 4 shows the cross-piece J in contact with said screws X; but this cross-piece J does not touch said screws when it is not expanded longitudinally by pressure against the pieces of insulating material L, as shown in Figs. 2 and 3.

To prevent the apparatus from registering when the carriage is not occupied by a passenger, I employ a circuit-closing device, P, Fig. 1, which is placed under the cushion of the seat of the carriage, and which closes the circuit only when the weight of the passenger on the seat presses upon it.

In the registering device which is shown in Figs. 11 and 12 the alternate electric currents produced by the circuit-controlling device attract an armature, *m*, to the electro-magnet *m*<sup>2</sup>, which is in the circuit. The armature *m* is fixed to a lever, *n*<sup>2</sup>, pivoted at *n*. The armature *m*, after it has been attracted by said magnet, is removed therefrom by a spring, *y*. The lower end of lever *n*<sup>2</sup> is provided with an anchor, *p*, which prevents a crank, R, which is revolved by suitable clock-work wound up at N, Fig. 12, from making more than half a revolution at a time. The said clock-work connects the arbor of the crank R with a shaft, S<sup>3</sup>, carrying indicating-hands S T that move over a dial, U.

To prevent the apparatus from registering after the carriage has traveled a certain number of miles, I employ a pin, *s*, which may be made to project beyond the dial, preventing the small or mile hand T from going farther.

The operation of my improved apparatus is as follows: The wheel of the carriage in its forward movement revolving it also revolves the wheel *a*, and this in turn revolves the wheel *b* in the direction of the arrow, Fig. 2, and also the cam B, which presses down the rods F and D by bearing upon the pin *e* of the rod D, and consequently pressing down the piston G, which is secured to the rod F. The air which is confined in the cylinder H under said piston G is allowed to escape by the valve *z* of said piston, until said piston reaches the piston I and presses the same down. It will be seen that even when the pistons G and I are in contact there remains a small amount of air between them in the spaces between the washers *r*<sup>2</sup>, which hold the packing *r* and the sides of the cylinder H. When the pin *e* escapes from contact with the cam B, the rods D and F are suddenly raised by the action of the spring *g*, and said rod F also raises the piston G suddenly. This sudden upward motion of said piston rarefies the air which is contained between it and the piston I. The external pressure of the air suddenly raises the piston I into this rarefied space, and the flexible cross-piece J, being attached to said piston by its rod *i*, striking the pieces of insulating material L, is expanded longitudinally and makes an electrical connection between the screws X X. After the cross-piece J has touched the screws X in its upward motion the air entering the cylinder through the hollow piston-rod *i* fills the rarefied-air space in said cylinder H, and the flexible cross-piece J, moving downward, is allowed to contract longitudinally, thus breaking the circuit. If at the instant when the cross-piece J is touching the screws X a passenger is occupying the seat of the carriage, the circuit-closing device P is in action, and the circuit being thus completed a current of electricity is sent through the wires. This current magnetizes the core of the electro-magnet *m*<sup>2</sup> (shown in Fig. 11) and attracts the armature *m*, moving the lever *n*<sup>2</sup> and allowing the crank R to make half a revolution. After the flexible cross-piece J has struck the pieces of insulating material L it contracts longitudinally by its own force (the rarefied-air space in the cylinder H having been filled by the air entering through the piston-rod *i*) and assumes the position shown in Fig. 2, thus instantly breaking the circuit after having first closed it.

The above operations are repeated as the carriage advances with its passenger, and the results are alternate electric currents flowing through the wires. These alternate electric currents allow the crank R to revolve by half-revolutions, which are made to indicate upon the dial U of the registering device the distance traveled by the passenger, the wheels of



the registering device having the proper relations to the circumference of the carriage-wheel, so as to correctly indicate the distance traveled in miles.

5 When the carriage goes backward, the pawl  $d^2$  slips loosely on the ratchet-wheel  $d$ , and thus does not drive the circuit-controlling mechanism.

10 A very important feature of my invention is, that the circuit cannot continuously be kept closed by any accident to the apparatus, as the flexible cross-piece  $J$  contracts longitudinally by its own force after it has made an electrical connection between the screws  $X$   $X$ .

15 I claim—

1. The combination of the hub  $A$  of the wheel of a carriage with the wheel  $a$ , wheels  $a^2$   $b$ , cam  $d$ , pawl  $d^2$ , shaft  $f$ , pin  $e$ , rod  $D$ , piston-rod  $F$ , spring  $g$ , piston  $I$ , and circuit-

closing flexible cross-piece  $J$ , substantially as 20 herein shown and described.

2. The combination of the reciprocating pistons  $G$  and  $I$  with the flexible metallic cross-piece  $J$  on piston  $I$ , insulating-blocks  $L$ , and screws  $X$ , which are connected to a battery, 25 all arranged substantially as herein shown and described.

3. The combination of the reciprocating spring  $g$ , screws  $X$   $X$ , and insulating-blocks  $L$ , with conducting-wires connecting with said 30 screws, electro-magnet  $m^2$ , armature-lever  $n^2$ , anchor  $p$ , and clock mechanism controlled by said anchor, substantially as herein shown and described.

EDWARD S. BROWNSON.

Witnesses:

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JAMES TURK.