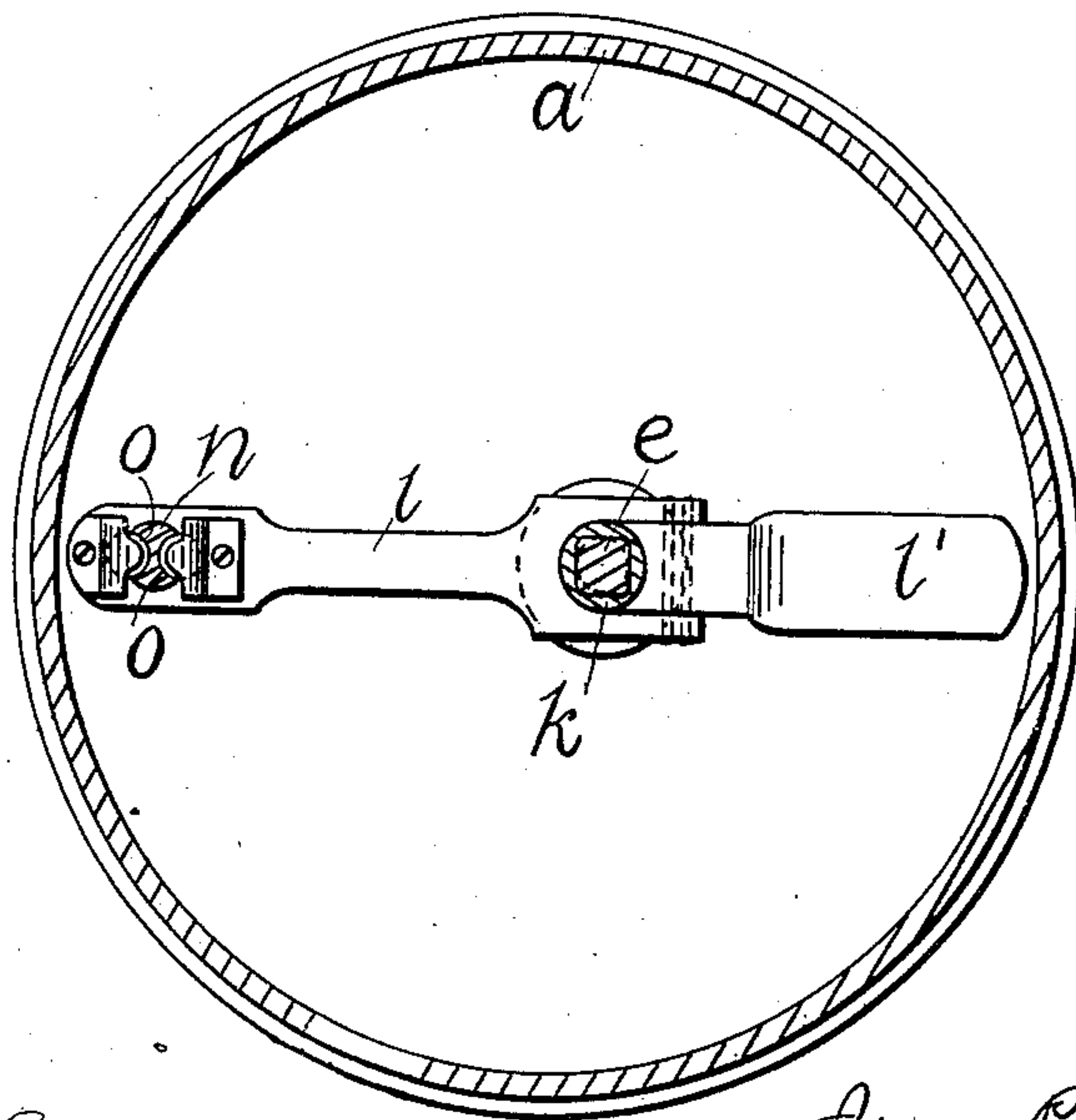
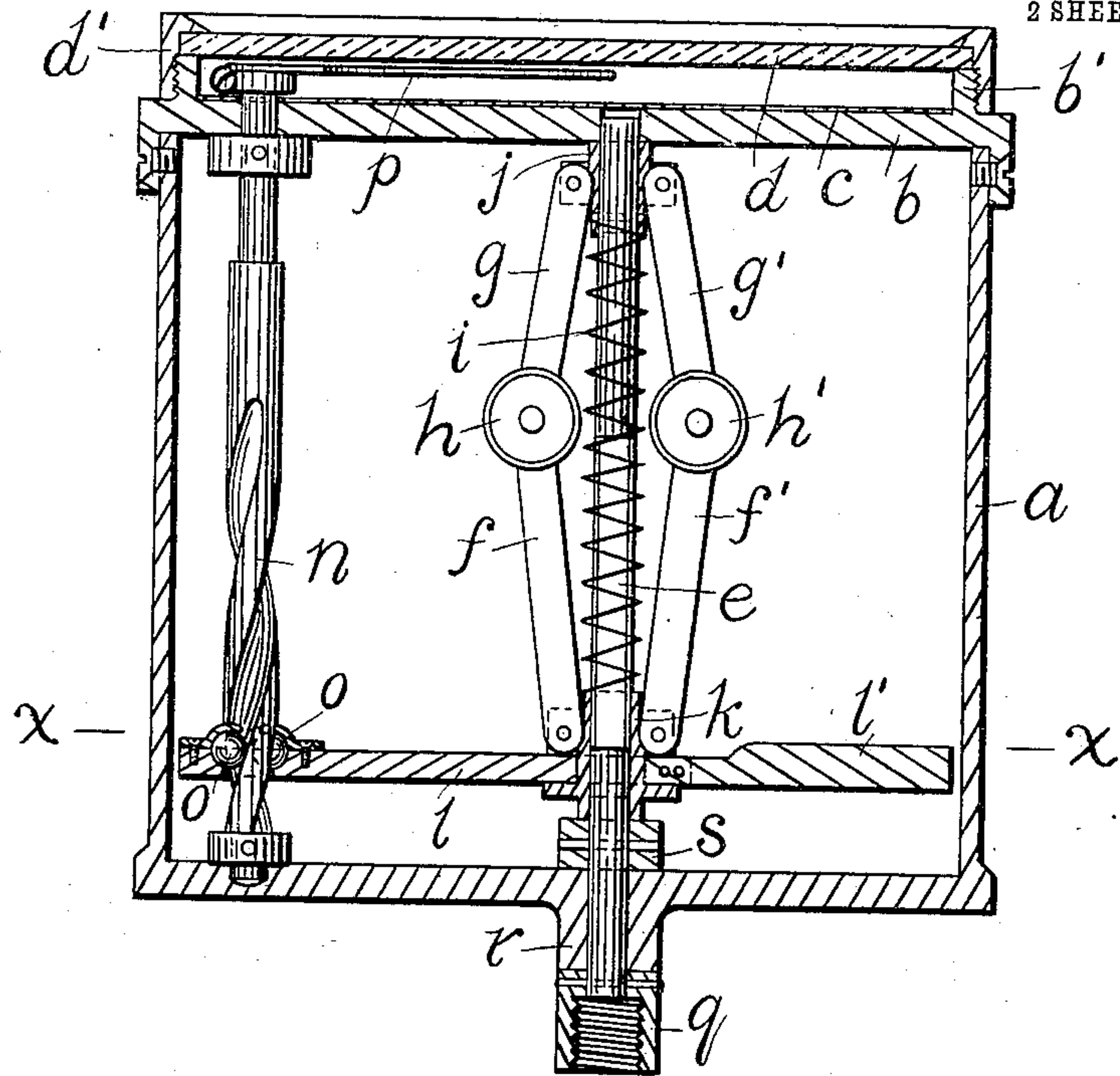


No. 863,266.

PATENTED AUG. 13, 1907.

I. P. DAVIS.
SPEED INDICATOR.
APPLICATION FILED NOV. 2, 1908.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

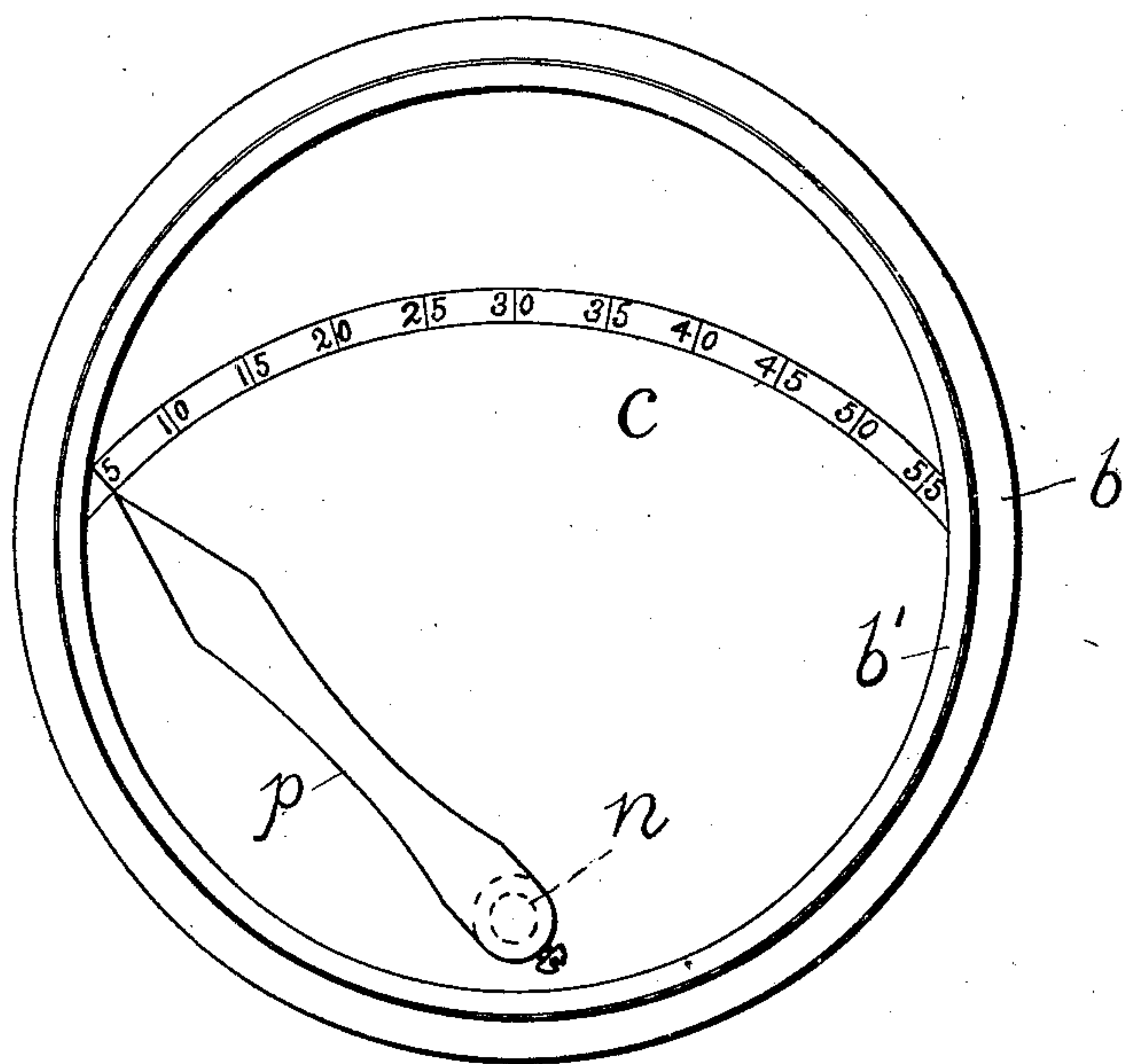


FIG. 3.

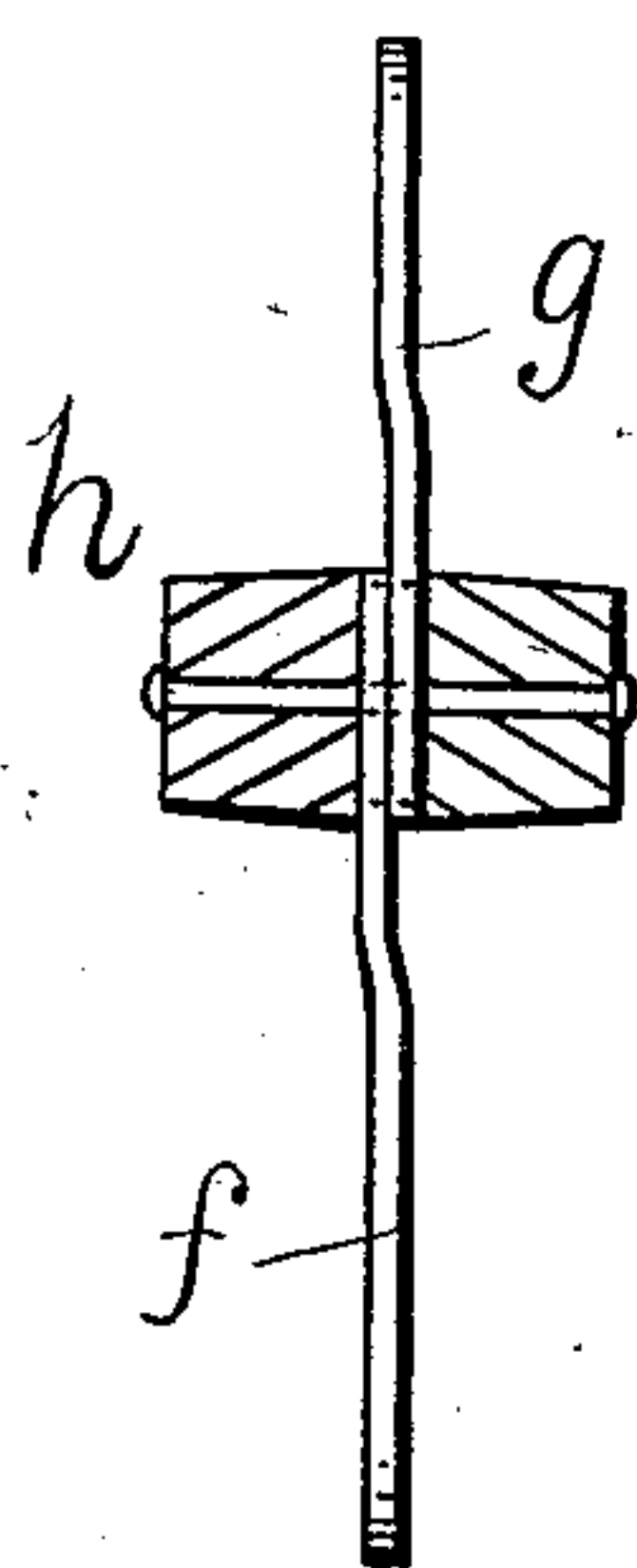


FIG. 4.

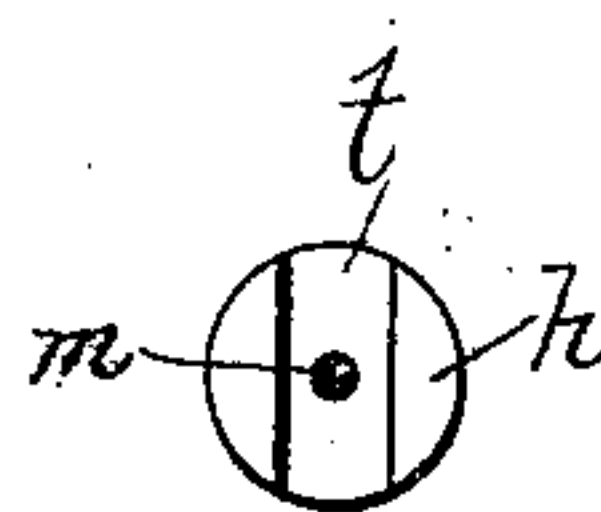


FIG. 5.

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UNITED STATES PATENT OFFICE.

ISAAC PARSONS DAVIS, OF SPRINGFIELD, MASSACHUSETTS.

SPEED-INDICATOR.

No. 863,266.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed November 2, 1906. Serial No. 341,765.

To all whom it may concern:

Be it known that I, ISAAC PARSONS DAVIS, a citizen of the United States of America, residing in Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Speed-Indicators, of which the following is a specification, reference being had to the accompanying drawings and letters of reference marked thereon.

My invention relates to a device to be connected with automobiles, street cars, and other vehicles, and adapted to indicate on a dial the speed at which such vehicle is moving. Heretofore various devices have been constructed intended for the accomplishment of this desirable result, but most of the same are extremely expensive and complicated and therefore, being thus expensive and liable to get out of repair, have not come into general use.

The object of my invention is to provide a device of the character referred to which shall be inexpensive in cost of construction, of few and simple parts so constructed that it will readily and accurately indicate the speed at which the vehicle is moving, and so constructed that liability of getting out of repair is reduced to the minimum.

I accomplish the objects of my invention by the construction herein shown.

In the accompanying drawings, in which like letters of reference indicate like parts, Figure 1 is a side elevation and partial section of my device; Fig. 2 is a cross-section of the governor shaft, a plan view of the operative member extending therefrom, and a cross-section of the spiral in operative connection with said member, said view being taken on lines $x-x$, Fig. 1; Fig. 3 is a plan view of the dial with the pointer in place, and Figs. 4 and 5 are detail views of the governor balls and their connecting arms.

In detail, a indicates the case, b a cover for the same, c the dial, d glass cover for the dial, d' ring to hold the glass in place, e the governor shaft or spindle, f and f' lower governor arms, g and g' upper governor arms, h and h' governor balls, i governor spring, j a collar fixed to the governor shaft, k a collar on the governor shaft but movable vertically, l connecting member extending between the collar k and the spiral member, l' counterweight for the connecting member l , n a spiral shaft, o antifriction balls mounted in the member l and in engagement with the spiral member, and p pointer.

The construction and operation of my device will be readily understood on reference to the drawings in connection with this description. A suitable case a is provided which may be made of any suitable material, and while I prefer that the base and side portions be made of metal and formed integral, it will be readily seen that it may be made of other material and of separate parts. The cover b is constructed to fit over the side walls of the case a and protect the entire mechanism from injury.

The cover b is provided with the upwardly projecting flange b' and I prefer that the dial rest within the annular recess formed by this upwardly-projecting part. A glass d rests upon the annular flange b' , and I may use a rubber ring both above and below the glass so as to render the same water-tight and provide a ring d' having an inwardly-projecting annular flange which flange bears upon the glass or upon the packing above it, and I prefer that the annular flange b' be exteriorly threaded and the ring d' be interiorly threaded so that when the parts are screwed together the glass will be clamped between the flange on the ring and the annular flange b' and thus held firmly in position.

A shaft e is arranged to rotate in the case, the same projecting through the base portion thereof and having bearing in the part b . The collar j is secured to the shaft e so that the collar will rotate with the shaft. The collar k is mounted on the shaft but is free to move vertically thereon, and I prefer that the parts be so shaped or constructed that the collar k will be positively rotated by the shaft e . This I may accomplish in various ways. As at present advised I prefer that the shaft be rectangular in cross-section in that portion traversed by the collar k and of course the opening in the collar k will be of like shape. By this construction danger of twisting or unduly straining the governor arms by reason of all of the rotating force being transmitted to the governor balls through the upper arms only is avoided. It will readily be seen that the portion of the shaft traversed by the collar k may be triangular in cross-section or of other shape and the same result accomplished, and also that a spline may be inserted, or that the shaft be provided with a groove and a projection in the collar enter such groove, so that the rotation of the balls will be caused by the rotation of both collars instead of by the rotation of one collar only as has been heretofore.

The collar k is preferably provided with an annular channel in which I mount the arm or member l , which arm extends toward the spiral member n and is in engagement therewith so that when the shaft revolves the governor balls will be thrown outwardly in the well-known manner and the lower ends of the governor arms f and f' will be moved upwardly carrying with them the collar k which carries with it the arm l , and as the arm l moves upwardly, it being in engagement with the spiral, will cause the spiral to revolve, and as the pointer is mounted on the spiral it will move over the dial and, the latter being properly marked, the pointer will indicate thereon the speed at which the vehicle is moving. It is, of course, well understood that the governor shaft is connected by suitable mechanism with the flexible shaft or otherwise with a revolving part of the vehicle so that, as such part rotates, its motion is transmitted to the governor shaft and the revolution of the shaft causes the movement, as here-

tofore explained, of the member *l* which causes the rotary movement of the spiral member, thus causing the pointer to traverse the dial.

In order to avoid undue friction I prefer that the engagement between the member *l* and the spiral be by means of antifriction balls, although the employment of antifriction means between these members is not necessary in order to insure the operation of the device, as the friction between these two members is very slight. I prefer, however, as before stated, to employ the antifriction device, and to avoid danger of binding I also prefer to provide the member *l* with a counterweight *l'* so that the weight of the member extending from one side of the shaft may be equal to the weight of the same member extending on the opposite side, and although this is not a necessary feature to the successful operation of the device, it is desirable from a mechanical standpoint.

Any convenient means of connecting the flexible shaft or other connecting means between a revolving part of the vehicle and the speed indicator may be employed. I have shown a simple collar *q* by means of which a connection may be made. I prefer that the base portion of the case be provided with a boss *r* so as to give the shaft sufficient bearing therein. The collar *s* is fixed to the shaft and revolves with it and prevents lateral motion. It will readily be seen that ball bearings may be arranged between the collar *s* and the base portion upon which it rests so as to reduce the friction, if it be found desirable.

The governor balls are shaped as shown in Figs. 1, 4 and 5, the same being made in two sections with a pin *m* extending therethrough upon which said sections are pivotally mounted, the heads or outer portions of said pins being upset to hold the two sections in place. The inner faces of the sections are milled out, as shown at *t* in Fig. 5, to receive the governor arms, one arm being by preference arranged in the groove in one of said sections, and the other in the opposite one. The arms are by preference made of sheet-metal and the outer portions thereof mounted in their respective collars and the other opposite end portions connected with the governor balls, as before explained, they being held in place by the pivot running through the governor balls, and they may also be secured to the balls by soldering or otherwise attached thereto, and in order to bring the arms in perfect alinement they are twisted or offset a trifle as indicated in Fig. 4 so that the balls will be directly opposite each other and the whole device be in balance. The bending of the governor arms so as to bring about the necessary alinement, it will be observed, enables me to construct the device very economically.

It is to be understood that the term "ball" as used in connection with a part of the governor does not necessarily here imply a spherical body, but refers to a weight such as that shown or to one of any other shape and construction whether spherical or otherwise.

The office of the spring *i* is to assist the balls or weights to depress the member *l* in case dirt should accumulate in the spiral *n*, also to prevent said member from rising too suddenly or too far when the vehicle is running at a low speed, as it might without the presence of such a spring have a tendency to do unless the weights were rather heavier than it is desirable to have them.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a speed indicator, the combination, of a rotary non-reciprocating governor shaft, a ball governor consisting in part of a rotary sliding member on said shaft, a rotary member at one side of said governor shaft having a peripheral spiral, a pointer in operative connection with said spiral member, and connecting means between the rotary sliding member of the governor and the spiral member whereby the spiral member is caused to revolve by reason of the rising and falling movement imparted to said sliding member on the governor shaft. 70

2. The combination, in a speed indicator, of a suitable case, a ball governor therein having a rotary non-reciprocating shaft and a rotary sliding member on said shaft, a rotary member outside of said governor having a peripheral spiral and mounted in the case, and an arm adapted to be moved by said rotary sliding member in a line parallel with and in engagement with the spiral member, a suitable pointer operated by the spiral member, and a suitable index properly positioned relative to said pointer. 75 80 85

3. The combination, in a speed indicator, of a shaft a ball governor having a movable collar to slide on the shaft, a spiral member parallel with said shaft, a pointer in operative relation with said spiral member, a dial for said pointer, and operative mechanism between the sliding collar and spiral member whereby the pointer is caused to traverse the dial by the sliding movement of said sliding collar. 90

4. In a speed indicator, a suitable supporting frame, a ball governor mounted therein, a spiral member mounted to revolve, a balanced member in operative connection with the governor and with the spiral, whereby the spiral is caused to revolve by the movement imparted to the balanced member by the governor, a suitable pointer in operative relation with the spiral, and an index for said pointer. 95 100

5. In a speed indicator, with a ball governor having a rotary non-reciprocating shaft, the combination of an outside spiral member and a member extending from the governor to the spiral and having sliding connection with the latter and with said shaft, a pointer in operative relation with the spiral, and an index for said pointer. 105

6. The combination, in a speed indicator, with a suitably mounted ball governor consisting in part of a rotary reciprocating collar, and a non-rotary sliding arm in operative connection with said collar, of a suitably mounted rotary member having a peripheral spiral and provided with a pointer, said arm engaging said spiral member and being adapted to cause the same to revolve in opposite directions as the arm moves in opposite directions with the governor collar. 110 115

7. The combination, in a speed indicator, with a suitably mounted ball governor consisting in part of a rotary non-reciprocating collar and a rotary reciprocating collar, and a non-rotary sliding arm in operative connection with said reciprocating collar, of a suitably mounted rotary spiral member provided with a pointer, said arm engaging said spiral member and being adapted to cause the same to revolve in opposite directions as the arm moves in opposite directions with the reciprocating governor collar, and a spring between the two governor collars. 120 125

8. The combination, in a speed indicator, of a rotary non-reciprocating governor shaft, a ball governor, a non-rotary sliding arm in operative connection with said governor and arranged to move along said shaft when the governor balls change position, a rotary spiral member suitably mounted outside of said governor and provided with a pointer, and bearing balls carried by said arm and operatively held thereby in the grooves of said spiral. 130

9. In a speed indicator, a governor comprising a shaft, a collar tight on such shaft, a second collar loose on said shaft, two pairs of arms pivotally attached to said collars a pair to each, two weights each consisting of two sections fastened together endwise, and pins to secure said ball sections together, the inner ends of the arms being pivotally mounted on said pins between the sections which make up the weights, the arms being bent to bring them into central alinement. 135 140

10. The combination, in a speed indicator, with a case having a removable cover thereon, of a governor shaft and 145

a spiral member journaled in the bottom of said case and in said cover, a governor on said shaft, and an operating member for said spiral member in operative engagement with said governor and spiral member.

- 5 11. The combination, in a speed indicator, with a case, a removable cover on said case having a flange on top of the same, a dial within said flange on top of the cover, a glass supported by the flange, and a removable ring engaging the flange and adapted to hold the glass in place,
10 of a shaft journaled in the bottom of the case and in the

cover, a governor on said shaft, a spiral member also journaled in said bottom and cover and extending through the latter, a pointer on such projecting end of said spiral member above said dial, and an operating member for the spiral member in operative engagement with said governor 15 and spiral member.

ISAAC PARSONS DAVIS.

Witnesses:

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