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SPEED GAGE.

APPLICATION FILED MAR. 25, 1907.

932,885.

Patented Aug. 31, 1909.

Fig. 1.

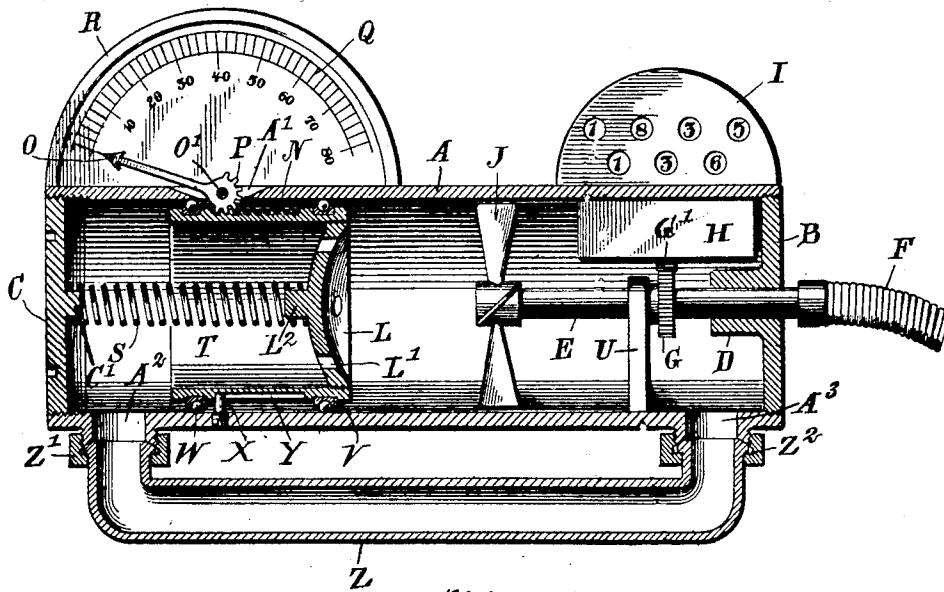
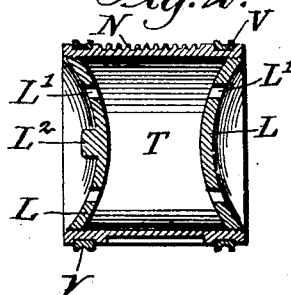


Fig. 2.



WITNESSES

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SPEED-GAGE.

932,885.

Specification of Letters Patent. Patented Aug. 31, 1909.

Application filed March 25, 1907. Serial No. 364,243.

To all whom it may concern:

Be it known that we, ORSON D. MUNN and JOHN K. BRACHVOGEL, citizens of the United States, and both residents of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Speed-Gage, of which the following is a full, clear, and exact description.

This invention relates to speed gages, and it is particularly useful in connection with devices of this character intended for measuring the speed of railroad trains, automobiles and the like.

The object of the invention is to provide a simple and efficient speed gage by means of which the speed of moving bodies can be measured with accuracy, and which is insensitive to shocks and concussions.

A further object of the invention is to provide a speed gage in which a circulating fluid medium is employed, and which is sensitive to extremely slight changes in the degree of velocity of the moving body.

The invention consists in the construction and combination of parts to be more particularly described hereinafter and fully set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which—

Figure 1 is a vertical cross-section of the device; and Fig. 2 is a vertical cross-section of a modified form of a detail.

Before proceeding to a more detailed description of our invention it should be understood that while we preferably use air as a circulating fluid medium, any other fluid, such as gas, water or oil may be used with equal efficiency and with substantially no change in the arrangement of the device. In our speed gage we employ a case in which is slidably mounted a movable member which actuates the indicating means showing the speed; the member is operated by means of a blower or rotary pump. The fluid medium is forced against one side of the movable member, while, simultaneously, the fluid medium is withdrawn from the case at the opposite side of the movable member; this is provided with openings therethrough and presents openings between its body and the wall of the case, through which the fluid medium can pass from one side of the member to the other. The member is moved within the case by the difference in pressure

of the fluid medium at its opposite sides. Resilient means, preferably a helical spring, is provided for resisting the movement of the member and the resilient means returns the member to a normal position when the pressure is equalized on both sides of the same. The movable member is provided with openings therethrough for the passage of the fluid medium. The primary object of these openings is to steady the movable member and to increase the effect of the fluid medium thereupon by preventing the cushioning of the same and the formation of eddying currents, on the principle of perforated or lateen sails.

Referring more particularly to the drawings, A represents the case, which is preferably cylindrical in form and has internally threaded ends. A properly threaded cylinder-head B having an integral bearing D near its center is mounted at one end of the cylinder A. A second cylinder-head or closure C having an integral projection C' at its inner side near the center, is mounted at the opposite end of the cylinder A. A shaft E is rotatably located in the bearing D and in a support U within the cylinder. The shaft E has near its inner extremity a centrifugal pump or blower J. The opposite end of the shaft E extends beyond the cylinder-head B and is joined to a flexible shaft F by means of which the rotation of the moving part the speed of which is to be measured, is transmitted to the shaft E. Mounted upon the shaft E is a gear wheel G in mesh with a second gear wheel G' by means of which an odometer H of the ordinary type is operated. The odometer H has the usual dial I mounted upon the cylinder A, and is adapted to indicate the distance traveled when the device is used in connection with an automobile or other vehicle.

Located within the cylinder A is a piston member T preferably cylindrical in form, and substantially smaller in diameter than the internal diameter of the cylinder. The piston T has peripheral rings V carrying ball-bearings W adapted to slide upon the inner face of the cylinder A and materially to decrease the friction between the moving piston and the cylinder wall, while at the same time permitting the escape of the air or other fluid medium from one side of the piston to the other. A screw stud X mounted upon the cylinder wall and projecting

inwardly, engages with a groove Y in the piston and prevents the rotation of the same about a longitudinal axis. The tubular piston member is internally threaded at one end and has a similarly threaded piston head L, preferably cup-shaped, and having openings L' therethrough to permit the passage of the air or other fluid medium from one side of the piston head to the other. The piston head L has an integral projection L² on the side adjacent to the cylinder-head C. A helical spring S is mounted between the piston head L and the cylinder-head C upon the projections L² and C' and resists the movement of the piston toward the head C, holding it in its normal position as shown in Fig. 1.

Formed upon the periphery of the piston in the longitudinal direction of the same is a rack N adapted to engage with teeth P formed upon the curved end of a dial pointer O mounted pivotally by means of a pin O', in a slot A' in the cylinder wall. The arrangement is such that when the piston is moved in the longitudinal direction of the cylinder, the pointer O is swung about its pivot O' by means of the rack N and the teeth P formed upon the pointer, which engage with the corresponding teeth of the rack. The pointer O indicates the speed measured, upon a scale Q inscribed or otherwise marked upon a dial-plate R mounted upon the cylinder A. The arrangement is such that when the piston is in its normal position, the teeth P are in mesh with the teeth at one end of the rack, the pointer O indicating the zero of the scale. When the piston is moved toward the cylinder-head C, compressing the spring S, the pointer O is pivoted about the pin O' and advances along the scale, indicating the speed at which the moving parts are traveling, the speed corresponds to the position of the piston, as the velocity of the blower J, and, consequently, the pressure tending to force the piston against the tension of the spring S is directly proportionate to the speed of the moving part.

Near each end of the cylinder A are openings A² and A³ having tubular threaded extensions. The openings A² and A³ are so arranged that the piston and, preferably, the blower, are located between the openings. The tube Z has flanged, laterally-disposed ends engaging the threaded extensions of the openings A² and A³ and secured in position by means of threaded sleeves Z¹ and Z², having flanges engaging the flanges of the ends of the tube Z and adapted to force the ends of the tubes against the cylinder openings when the sleeves are screwed in place on the threaded extensions. The tube Z affords communication between the openings A² and A³ and permits the circulation of the air or other fluid medium employed through

the cylinder A and the tube Z, the medium being permitted to pass the obstructing piston through the openings L' or through the openings between the piston and the inner wall of the cylinder.

This arrangement is of advantage in that by means of the blower J pressure is simultaneously exerted upon one side of the piston, and the air is exhausted at the opposite side, thus materially increasing the difference of pressure on the opposite sides of the piston and rendering the device far more sensitive than if the air were merely forced against one side of the piston.

Fig. 2 represents a modified form of piston in which the cylindrical piston member is internally threaded at both ends and is provided with two cup-shaped piston heads having openings. In this form of piston the piston head at the end of the piston member adjacent to the cylinder head C is provided with the integral projection L² which supports the spring S. Preferably, the cylinder A is mounted in a horizontal position, as thereby the device is not affected by the vertical vibrations most frequently encountered in moving vehicles upon springs, such as railroad trains or automobiles. The cylinder head C, which has the projection C' upon which the spring S is mounted, is adapted to be adjusted with respect to the length of the cylinder by means of the internal threads formed at the end of the cylinder, the threads extending for some distance into the same. By this means the spring S can be adjusted by screwing the cylinder head C in the direction of the length of the cylinder A and in this way the device can be exactly regulated when being calibrated to indicate various speeds with accuracy.

Having thus described our invention, we claim as new, and desire to secure by Letters Patent:—

1. A speed gage, comprising a cylinder having communicating openings, a piston mounted within said cylinder between said openings, indicating means controlled by said piston, and a blower in said cylinder adapted to force air against said piston.

2. A speed gage, comprising a cylinder having communicating openings, a piston between said openings, indicating means controlled by said piston, and a blower in said cylinder between said openings and adapted to force air against said piston.

3. A speed gage, comprising a cylinder having openings, a piston mounted within said cylinder, a spring adapted to resist the movement of said piston, a blower adapted to force air against said piston, a tube removably mounted at said openings of said cylinder, and effecting communication therebetween, and indicating means controlled by said piston.

4. In a speed gage, a cylinder, a piston

mounted within said cylinder and having ball bearings adapted to engage the wall of said cylinder, a spring adapted to resist the movement of said piston, means for forcing air against said piston, and indicating means controlled by said piston.

5. In a speed gage, a cylinder, a piston movable within said cylinder and having ball bearings adapted to engage the wall of said cylinder, a rack formed upon said piston, a pivoted pointer having teeth adapted to engage said rack, and means for forcing air against said piston.

6. In a speed gage, a cylinder, a piston mounted within said cylinder and having ball bearings adapted to engage the wall of said cylinder, means for forcing air against said piston, and indicating means controlled by said piston.

7. In a speed gage, a cylinder having a head, a piston movable within said cylinder and having ball bearings adapted to engage the wall of said cylinder, a helical spring mounted between said piston and said cylinder head and adapted to resist the movement of said piston, a rack formed on said piston, said cylinder having a slot, a pointer pivoted in said slot and having teeth in mesh with said rack, means for forcing air against said piston, and means for resisting the rotation of said piston about the longitudinal axis.

8. In a speed gage, a cylinder, a piston mounted within said cylinder, means for forcing fluid against said piston, indicating means controlled by said piston, said cylinder having an adjustable closure at one end, and a spring between said closure and said piston for resisting the movement of the latter.

9. In a speed gage, a cylinder, means for forcing air through said cylinder, indicating means, and a piston controlling said indicating means and comprising a cylindrical body having a concave adjustable head provided with openings therethrough.

10. In a speed gage, a cylinder, a piston mounted within said cylinder, means for forcing air against said piston, indicating means controlled by said piston, said cylinder having an adjustable head presenting a projection, said piston having a projection, and a spring between said head and said piston for resisting the movement of the latter, said spring being carried upon said projections.

11. In a speed gage, a cylinder having an

adjustable head, means for forcing air through said cylinder, indicating means, a piston within said cylinder and controlling said indicating means, said piston comprising a cylindrical body having an adjustable head, and a spring for resisting the movement of said piston and carried by said adjustable head of said cylinder and said adjustable head of said piston.

12. In a speed gage, a cylinder having an adjustable head, means for forcing air through said cylinder, indicating means, a piston within said cylinder and controlling said indicating means, said piston comprising a cylindrical body having a concave adjustable head, said heads having projections at the adjacent sides, a spring carried between said heads upon said projections, and means for preventing the rotation of said piston within said cylinder.

13. A speed gage, comprising a case, a member movable within said case and presenting a concave face, indicating means controlled by said member, and means for forcing air against said concave face, said concave face having an opening therethrough.

14. A speed gage, comprising a case, a member movable within said case and presenting an opening between the same and said case to permit the escape of air beyond said member, said member having a concave face provided with an opening therethrough, indicating means controlled by said member, and means for forcing air against said concave face.

15. A speed indicator comprising a casing having an endless passage therein, a spring-held abutment plate or disk in said passage and having its edge arranged closely adjacent at all points to the wall of said passage, a propeller arranged in said passage opposite said abutment plate or disk for maintaining fluid in circulation in said passage, a shaft projecting through the wall of said casing whereon said propeller is mounted, an indicating pointer, and gear connections between said pointer and said abutment plate or disk.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ORSON D. MUNN.
JOHN K. BRACHVOGEL.

Witnesses:

JOHN P. DAVIS,
A. H. DAVIS.