





# UNITED STATES PATENT OFFICE.

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## SPEED-INDICATOR.

No. 811,666.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, SAUL SCHULHOFF, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Speed-Indicators, of which the following is a specification.

My invention has relation to a speed-indicator, and in such connection it relates more particularly to means for subjecting a liquid to a pressure and for preventing an exit of the liquid from a receptacle in which the same as well as the pressure-exerting means are confined.

The principal objects of my invention are, first, to actuate means adapted to indicate the speed of travel of a vehicle or the speed of rotation, for instance, of a shaft, by pressure which is exerted on a liquid by rotatable means; second, to provide the speed-indicator with a housing or cylinder for receiving and confining a liquid therein and means for exerting pressure thereon; third, to provide the cylinder with a shaft adapted to support and actuate the pressure-exerting means, and, fourth, to provide the shaft and cylinder with means for preventing the longitudinal movement of the pressure-producing means within the cylinder and exit of liquid therefrom.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a view, partly in side elevation and partly in section, illustrating a cylinder, a liquid confined therein, a spiral screw carried by a shaft extending through the cylinder, as well as a box carried by the same, and through a sleeve and stuffing-box carried by the box, a pulley for actuating the shaft and screw, and a tubular extension of the cylinder provided with a pressure-indicator, all embodying the features of my invention; and Fig. 2 is a cross-sectional view taken on the line  $xx$  of Fig. 1 and illustrating the sectional and chambered box and one of the disks of the shaft engaged and surrounded by the same.

Referring to the drawings,  $a$  is a cylinder or housing to one end of which is removably secured a tapering head  $a'$ . To the head  $a'$  and preferably by means of a swivel-nut  $a^2$  is connected a hose or tube  $b$ , which in the pres-

ent instance is provided with an indicating device  $b'$ , commonly known as a "Bourdon gage." The opposite end of the cylinder  $a$  is closed by a head  $a^2$ , through which passes one end of a shaft  $c$ , the other end of which is supported by a bearing  $a^4$ , arranged in the tapering head  $a'$  of the cylinder  $a$ . On the shaft  $c$  and between the bearing  $a^4$  and head  $a^2$  is arranged a spiral screw  $d$ , which is surrounded by a liquid  $e$ , in the present instance with oil, which completely fills the cylinder and tube  $b$ , as well as the curved tube  $b^2$  of the indicating device  $b'$ . Thus the spiral screw  $d$  when rotated will exert more or less pressure on the liquid in the cylinder  $a$  and tubes  $b$  and tube  $b^2$ . If the speed of travel, for instance, of an automobile is to be indicated by the indicating device  $b'$ , the shaft  $c$  by means of the pulley  $c'$  and a belt or chain (not shown) may be driven from any of the rotating parts of the vehicle. By the rotation of the spiral screw  $d$  by means of the shaft  $c$  a pressure is exerted against the liquid  $e$ , which pressure by tending to expand the tube  $b^2$  of the indicating device  $b'$  actuates a pointer  $b^3$  by the intervention of a toothed sector  $b^4$  and gear-wheel  $b^5$ . As the pressure exerted by the rotation of the spiral screw  $d$  on the oil  $e$  is proportioned to the speed of travel of the automobile, this speed will accordingly be indicated by the pointer  $b^3$  on the dial  $b^6$  of the indicator  $b'$ . This indicating device  $b'$  may be placed in such a position on an automobile that the same is readily visible to the driver of the same.

The head  $a^2$  of the cylinder  $a$  is provided with an internally-threaded annular extension  $a^5$ , which serves for the reception of a box  $f$ , screwed into the same and which is divided into two parts  $f'$  and  $f^2$ , semicircular in cross-section, as shown in Fig. 2. Each section  $f'$  and  $f^2$  of the box  $f$  is provided with semicircular recesses or chambers arranged transversely to the longitudinal axis of the same and contiguous to each other, which when the sections assume their proper positions in the extension  $a^5$  form an annular chamber  $f^3$ , adapted to receive disks  $c^2$ , secured to the shaft  $c$ . In addition thereto each section of the sectional box is provided with a groove semicircular in cross-section, which grooves when the members of the box are assembled form an annular chamber arranged in the longitudinal central axis of the box, which is adapted to receive the shaft and permit of the rotation of the same therein. Both members  $f'$  and  $f^2$  of the box  $f$  are



externally threaded, so as to permit the same to be screwed into the extension  $a^5$  of the cylinder-head  $a^2$  and to receive an internally-threaded sleeve  $g$ , which by surrounding the members  $f'$  and  $f^2$  in the manner shown in Fig. 1 and by abutting against the extension  $a^5$  of the cylinder-head  $a^2$  locks the members  $f'$  and  $f^2$  securely together. The sleeve  $g$  is provided with a chambered extension  $g'$ , which, in conjunction with a gland  $g^2$ , engaging the same, forms a stuffing-box  $g^3$ , through which the shaft  $c$  passes. When the shaft  $c$  is rotated by the pulley  $c'$ , the disks  $c^2$ , turning in the box  $f$ , will hold the spiral screw  $d$  in proper position in the cylinder  $a$  and in addition thereto will prevent the outflow of the oil  $e$  from the cylinder by providing a circuitous and comparatively long path, through which the oil has to pass before reaching the stuffing-box  $g^3$ , which forms an additional safeguard against an outflow of the oil. The disks  $c^2$  by being completely surrounded by the sectional box and by being forced with one of their faces against the same, due to the resistance offered by the oil against the rotation of the spiral screw  $d$ , will form, in conjunction with the box  $f$ , a closure through which the oil under normal conditions cannot pass.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a speed-indicator, a cylinder adapted to receive and to confine a liquid, indicating means connected therewith and engaged by the liquid, a shaft arranged in said cylinder and extending therethrough, means arranged within said cylinder and secured to said

shaft and adapted when actuated by the same to exert pressure on the liquid and by the liquid to actuate said indicating means, disks secured to said shaft, a sectional block connected with said cylinder and having chambers, the chambers of said block arranged to receive a portion of said shaft and its disks, a sleeve adapted to hold the sections of said block together, and said disks and blocks adapted to hold said pressure-exerting means in position in said cylinder and to prevent exit of the liquid from the same.

2. In a speed-indicator, a cylinder adapted to receive and to confine a liquid, indicating means connected therewith and engaged by the liquid, a shaft arranged in said cylinder and extending therethrough, a spiral screw arranged within said cylinder and secured to said shaft and adapted when actuated by the same to exert pressure on the liquid and by the liquid to actuate said indicating means, disks secured to said shaft, a sectional block connected with said cylinder having chambers arranged to receive a portion of said shaft and said disks, a sleeve having a stuffing-box adapted to hold the sections of said block together and said disks and block adapted to prevent longitudinal movement of said pressure-exerting means in said cylinder and in conjunction with said stuffing-box to prevent exit of the liquid from the same.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

SAUL SCHULHOFF.

Witnesses:

WILHELM VOGT,  
THOMAS M. SMITH.