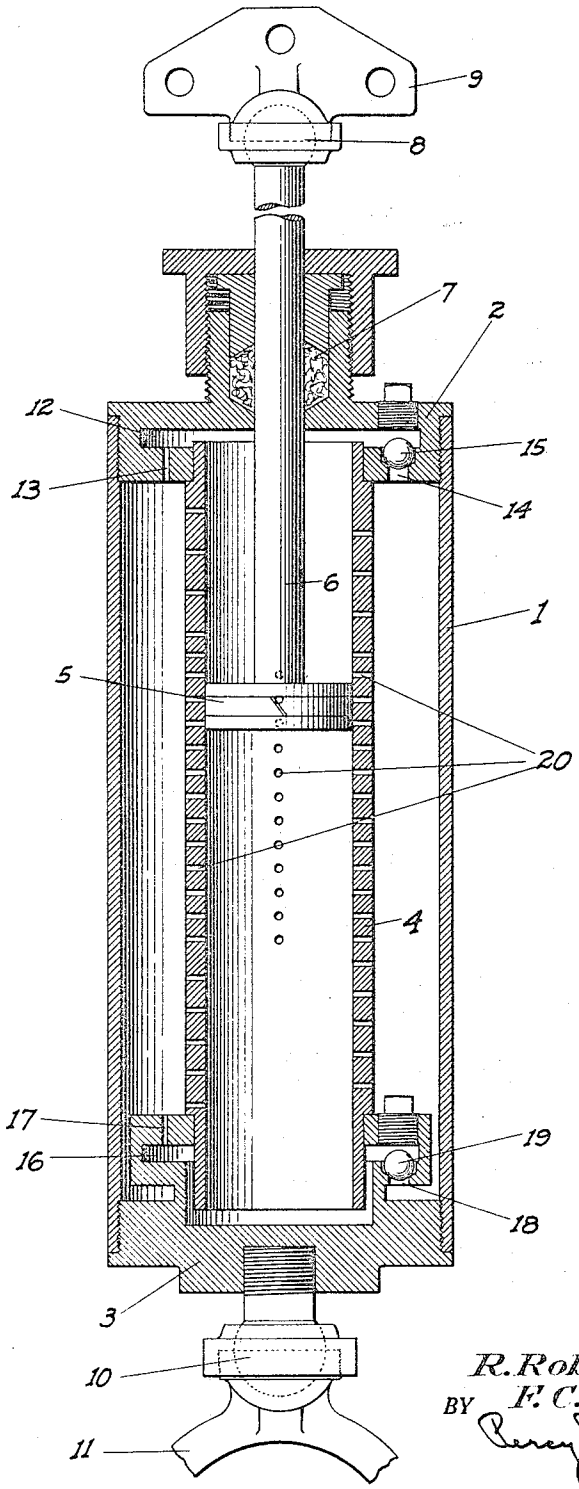
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SHOCK ABSORBER FOR USE ON AUTOMOBILES

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SHOCK ABSORBER FOR USE ON AUTOMOBILES.

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To all whom it may concern:

Be it known that we, RUSSEL ROBISON and FREDERICK C. MERKEL, citizens of the United States, residing at Jackson, county of Amador, State of California, have invented certain new and useful Improvements in Shock Absorbers for Use on Automobiles; and we do declare the following to be a full, clear and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in shock absorbing devices for automobiles or motor vehicles generally, our principal object being to provide a device of this character which uses oil or some other suitable fluid medium to take and absorb the shocks of the car, either on the compression or rebound of the car springs, and without the use of any springs or other mechanical flexible means.

Our device is so constructed that there will be little, if any, wear on what few moving parts there are and the entire construction of the apparatus is so simple that breakage of any part is extremely unlikely to occur, and the device should give good service without trouble arising throughout the life of the vehicle to which it is applied.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purposes for which it is designed.

These objects we accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

The figure on the drawing is a sectional elevation of the shock absorber.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes an outer cylindrical casing fixed in the upper end of which is a cap 2 and another cap 3 on its lower end. Mounted in and between said caps is an interior cylinder 4 spaced from the casing 1. Slidable in this cylinder is a piston 5 whose rod 6 extends through and beyond the upper cap 2, the latter having a suitable stuffing box structure 7 through which the rod passes. On top of said rod is a swivel connection 8 of a suitable character, the upper member of which is provided with a bracket 9 of some sort adaptable for attachment to the frame of the car directly above the rear or front axle as the case may be. The lower cap 3 has a similar swivel connection 10, the lower member of which has a saddle 11 or similar structure whereby it may be fastened either on the main spring or directly on the axle, as may be desired. Both the members 9 and 11 are removable from the shock absorber as a whole, in order that other similar pieces to suit different vehicles may be easily placed thereon.

Provided in the upper cap 2 is an annular chamber 12 having free communication with the upper end of the cylinder 4 and also with the casing 1 about said cylinder by a bleed hole 13 and a larger passage 14, the latter being normally closed by an automatically seating ball or other type of check valve 15. This check valve opens toward the chamber 12 and cylinder 4.

In the lower cap 3 is also an annular chamber 16 having free communication with the lower end of the cylinder 4 and with the interior of the casing 1 through a bleed hole 17 and a passage 18, the latter being normally closed by a valve 19 of the same type as the valve 15, and also opening toward the chamber 16.

Provided in the side wall of the cylinder 4 and throughout its extent between the caps is a plurality of orifices 20, these being of such a size or of such a number that their combined area adjacent the upper and lower end of said cylinder is considerably less than the area of said holes in the center portion of the cylinder, for the same vertical distance.

In operation the shock absorber, as previously stated, is connected between the frame and main spring or axle of the car. In this manner any spring movement at all will cause the piston in the inside cylinder to move up or down. The casing 1 and cylinder 4 are filled with oil throughout and normally the location of the piston 5 is somewhere near the center of height of the cylinder 4. With a slight up or down movement of the spring, such as is encountered under normal conditions and on good road, a very great shock absorber means is not necessary, and therefore in this portion of the cylinder the holes 20 are of such area or so closed as to offer very little resistance to the outflow or inflow of the oil from the cylinder to the casing, or vice versa. With excessive spring movements however, the piston approaches one

end or the other of the cylinder in which portions the holes are further apart, and consequently a greater resistance to the movement of the piston is encountered, which in turn prevents excessive movement of the spring, either up or down.

It will be noted that due to the arrangement of the holes, as stated, the resistance above mentioned is applied gradually and is increased as the piston nears the end of its stroke in either direction, due to the fact that the nearer the end of the cylinder the piston is forced, the fewer holes remain in front of it for the escape of the oil, which as will be evident creates greater back pressure.

The valves 15 and 19 automatically remain seated with any movement of the piston theretoward but can open with the movement of the piston away from the same, thus enabling the cylinder on either side of the piston to be quickly refilled with the oil, without depending entirely on its entering through the holes 20 and thus allowing the piston to return to a normal position with absolutely no resistance.

While we believe oil is the best liquid to use, at the same time we reserve the right to use water, air or any other liquid if desired.

Different sizes of the shock absorber will of course be necessary to take care of different types and weights of cars. It is also to be understood that if necessary or desirable the valves 15 and 19 may be increased in number and size over what is shown, this being true of the holes 20 likewise.

From the foregoing description it will be readily seen that we have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described our invention what we claim as new and useful and desire to secure by Letters Patent is:

1. A shock absorber including a cylinder, a piston movable therein, said cylinder being adapted to be filled with a fluid on both sides of the piston, passage means for the fluid on both sides of the piston communicating with each other and arranged to provide a restricted outflow of the fluid from that portion of the cylinder to which the piston is moving and to permit of an unobstructed inflow of the fluid into the cylinder behind the piston.

2. A shock absorber including a cylinder, a piston movable therein, said cylinder being adapted to be filled with a fluid on both sides of the piston, and means whereby with a movement of the piston in either direction the fluid will be by-passed around the piston, and will offer resistance ahead of the piston but none behind it.

3. A shock absorber including a cylinder, a piston movable therein, said cylinder being adapted to be filled with a fluid on both sides of the piston, by-pass means for the fluid around the piston arranged to restrict the outflow of the fluid from the cylinder with a movement of the piston in either direction, and valved passage means independent of said by-pass means, but communicating therewith, arranged to permit unobstructed inflow of the fluid only into that end of the cylinder away from which the piston is moving.

4. A shock absorber including a cylinder, a piston movable therein, said cylinder being adapted to be filled with a fluid on both sides of the piston, by-pass means for the fluid around the piston arranged to restrict the outflow of the fluid from the cylinder with a movement of the piston in either direction, and means for providing for an unrestricted inflow of the fluid into that end of the cylinder away from which the piston is moving.

5. A shock absorber comprising a casing having closed ends, a cylinder mounted in the casing and spaced from the sides thereof, a piston slidable in the cylinder, and a piston rod connected thereto and projecting beyond one end of the casing, the side wall of the cylinder having orifices therethrough at intervals throughout the length thereof, additional passage means between the ends of the cylinder and the interior of the casing, and valves in said passages normally closed and opening only toward the cylinder.

In testimony whereof we affix our signatures.

RUSSEL ROBISON.
FREDERICK C. MERKEL.