

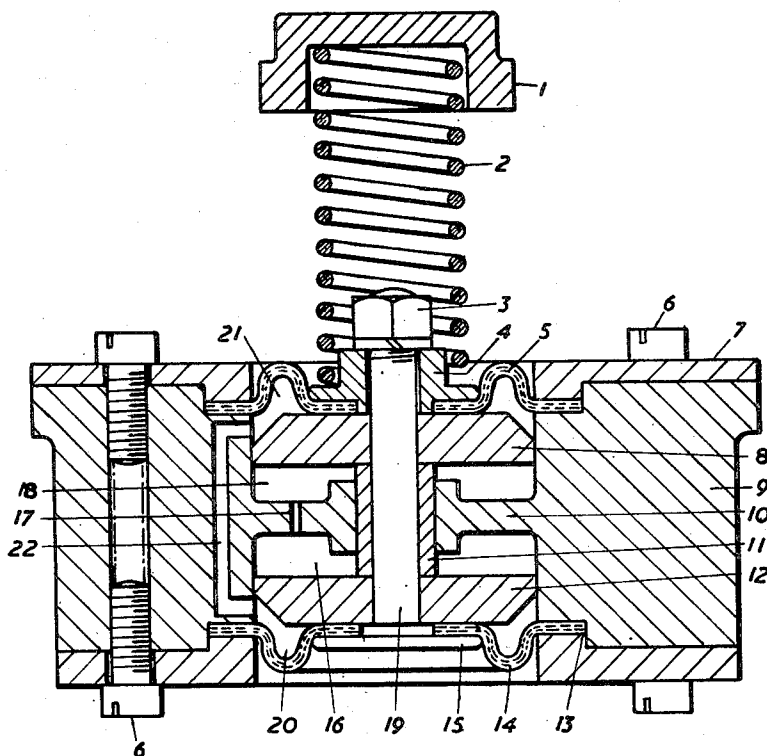
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LIQUID FILLED DASH POT DEVICE

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LIQUID FILLED DASH POT DEVICE

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This invention relates to liquid filled dash pot devices. Such devices usually comprise a piston operating in a liquid filled closed cylinder, the piston being provided with grooves or pierced by one or more ports of small bore through which the liquid is forced from one side of the piston to the other during the piston stroke. With dash pot devices of this kind difficulty is experienced in guarding against leakage of the liquid from the cylinder and also in the provision of arrangements for the transmission of a direct thrust through the device without the use of some form of lever mechanism.

Dash pot devices herein referred to as of the kind described, have been proposed which largely eliminate these disadvantages comprising a liquid filled cylinder closed at each end respectively by a flexible diaphragm and having intermediate its end an internal partition defining with said diaphragms two chambers, one on either side of the partition, permanently in communication one with the other through a restricted passage and having each a piston slidable therein with a spare or secondary chamber between each piston and its associated diaphragm and a stem passing slidably through an opening in the partition and rigidly connecting said diaphragms and said pistons. With this arrangement, however, the application of a thrust to the stem causes pressure to build up one or other of the secondary chambers, according to the direction of the thrust, which may be harmful to the diaphragm and calls for a diaphragm which is strong and of robust dimensions.

It is the object of the invention to provide a dash pot device of the kind described wherein the diaphragms are prevented from being exposed to these high hydraulic pressures brought about by the operation of the device thus enabling a lighter diaphragm to be used.

According to the invention a dash pot device of the kind described is provided with a relatively large passage between the two secondary chambers.

The invention is illustrated by way of example in the accompanying drawing, the single figure of which is a longitudinal part-sectional view of one form of dash pot device embodying the invention.

Referring to the drawing, the dash pot device here shown comprises a hollow cylindrical body 9 closed at each end by flexible diaphragms 5 and 14 respectively secured around their peripheries by clamping rings 7 and fitting into annular recesses 13 formed in the end faces of the cylindrical body and secured by a number of screws 6 so as to form a liquid tight joint. The cylinder is divided into two equal chambers 16, 18 by an inwardly extending radial rib or partition 10, through a central aperture in which passes, with a sliding fit, a tubular sleeve 11. Clamped to the inside surface of each diaphragm respectively are pistons 8, 12 spaced apart by the sleeve 11 and defining with the diaphragms 5 and 14 secondary chambers 21, 30 respectively. The pistons are a good sliding fit in the chambers 16 and 18 and a suitable form of packing (not shown) may be provided to

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prevent, as far as possible, the seepage of fluid between the chambers 16, 18 and the secondary chambers 20, 21. Each diaphragm and piston is provided with a central axial hole, all coaxially aligned with the bore of sleeve 11 and passing through these holes and the bore of the sleeve is a bolt or stem 19 having a flat head 15 at one end and threaded at its other end to receive a nut 3, a collar 4 being inserted between the nut 3 and the diaphragm 5. The nut 3 tightly clamps together the two diaphragms, pistons, and the sleeve. The whole cylinder is filled with oil and a small port 17 is provided in the partition, through which oil is forced from one chamber to the other during the stroke of the piston assembly. Establishing permanent communication between the two secondary chambers 20 and 21 is a passage 22 formed in the body 9 and of sufficient size to allow free flow of oil between those two secondary chambers.

From the foregoing it will be seen that an upward thrust applied to the stem head 15 causing the upward movement of the piston-diaphragm assembly results in the forcing of oil from chamber 16 through the restricted passage 17 into the chamber 18, whilst the upward movement of the piston 8 does not cause any disadvantageous build up of pressure in secondary chamber 21, oil from which is free to pass into secondary chamber 20 through passage 22.

It is to be understood that, whereas in the embodiment described above a small hole is provided through the partition 10 through which the oil is forced to provide the damping effect, it is evident that the communication between the two chambers provided for this purpose may take other forms.

The drawing shows, to illustrate one way in which a thrust may be transmitted through the dash pot device, a spring 2 located between the collar 4 and a spring cap 1. A downward thrust applied to the cap 1 will thus be transmitted through the spring to the collar 4 and thus to the diaphragm assembly which will move downwards, forcing oil from chamber 18 to chamber 16 through the restricted passage 17 piercing the partition 10. This downwards movement may, of course, be transmitted through the head 15 of the stem 19 to carry out any suitable function, such as the opening or closing of a valve.

Having thus described my invention, what I claim is:

1. A dash pot device comprising, in combination, a liquid filled cylindrical body; a first flexible diaphragm clamped around its periphery to one end of said body forming a liquid-tight seal; a second flexible diaphragm clamped around its periphery to the other end of said body forming a liquid-tight seal; a radial transverse partition fixed to the cylindrical body defining with said first and said second diaphragm two chambers within said cylindrical body and pierced by a hole coaxial with the bore of said cylindrical body; a first piston in one of said chambers and clamped to said first diaphragm and defining a first secondary chamber therebetween; a second piston in the other of said chambers and clamped to said second diaphragm and defining a second secondary chamber therebetween; a coaxial stem rigidly connecting said diaphragms and said pistons and passing through said hole in said partition and being a sliding fit therein; means constituting a restricted passage between said first chamber and said second chamber for permitting limited flow of fluid from one to the other when said stem is moved axially relatively to said cylindrical body, and means constituting a relatively unrestricted passage between said secondary chambers.

2. A dash pot device comprising, in combination, a liquid filled hollow cylindrical body; a first flexible diaphragm clamped around its periphery to one end of said

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body forming a fluid tight closure member therefor; a second flexible diaphragm clamped around its periphery to the other end of said body forming a fluid tight closure member therefor; a radially disposed internal partition fixed to the cylindrical body defining with said first and said second diaphragms two substantially equal chambers within said cylindrical body; a first piston in one of said chambers defining with said first diaphragm a secondary chamber therebetween; a second piston in the other of said chambers defining with said second diaphragm a second secondary chamber therebetween; a co-axial hollow sleeve passing slidably through a co-axial hole in said partition and spacing apart said pistons; a bolt passing through a central hole in each of said diaphragms and said pistons and through said sleeve clamping said dia-

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phragms said pistons and said sleeve rigidly together; means constituting a restricted passage between said chambers for permitting the flow of fluid from one chamber to the other when said bolt is moved axially relative to said cylindrical body and means constituting a relatively unrestricted passage between said secondary chambers.

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