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2,299,472

PORT PROTECTOR

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Fig 1

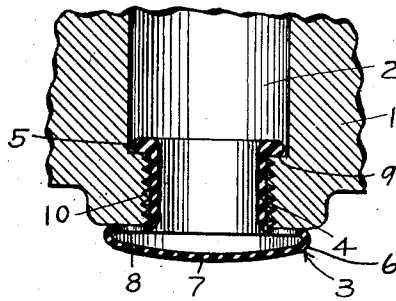


Fig 2

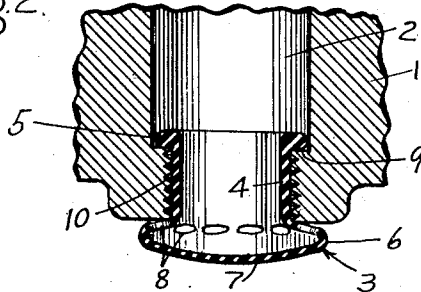


Fig 3

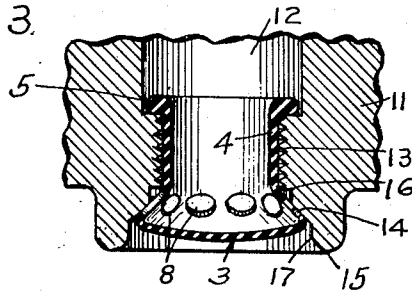
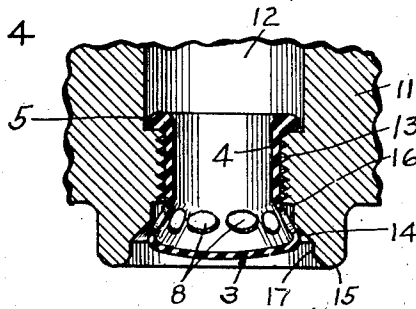


Fig 4



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PORT PROTECTOR

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8 Claims. (Cl. 303—1)

This invention relates to an attachment for the atmospheric passage of a fluid pressure brake valve device to prevent the obstruction of this passage by foreign matter.

It is well known, that insects such as mud wasps, sand daubers, bees and the like will enter a fluid pressure brake valve device through the atmospheric port therein and deposit solid matter in the inner, smaller ports, which in some instances cause a subsequent failure of operation of the valve device. An object of my invention is to provide an improved device effective to positively prevent the entry of such insects without interfering with the normal functioning of the valve device.

Another object of my invention is to provide an attachment that will effectively cover the atmospheric port so as to eliminate the collection of dirt or foreign matter in the passage, or in the attachment itself, and which will not protrude unduly from the device.

Other objects include providing a device which will prevent the blowing of rain or water into the atmospheric passage of a valve device; which will break ice formations that are sometimes incurred in the cold season and which prevent the exhaust of fluid under pressure from the valve device; which is adapted to be applied to those fluid pressure valve devices which are already in service, without modification of the valve device; and which is simple, durable, inexpensive, and will serve the purpose set forth in the foregoing objects effectually.

Further objects and advantages will be apparent from the following more detailed description of my invention.

In the accompanying drawing, Fig. 1 is a vertical sectional view of a portion of a fluid pressure brake valve body having therein an atmospheric port and showing a port protector embodying the invention disposed in the port, with the parts thereof in normal position. Fig. 2 is an illustration of the same embodiment with parts shown in the venting position. Fig. 3 illustrates the same embodiment disposed in an atmospheric port having the mouth thereof recessed, with the parts shown in normal position. Fig. 4 illustrates the same adaptation as in Fig. 3 with the parts shown in the venting position.

Considering now more in detail the invention illustrated in Figs. 1 and 2, I have shown in fragmentary form a valve device 1 provided with a discharge passage 2 terminating in an atmospheric port 10. This valve device is intended to be representative of the various types of valve

devices employed in fluid pressure brake equipments having an exhaust passage and port. As will be evident presently, the size and shape of the exhaust port is immaterial, as the invention can be adapted to any size and shape.

In Figs. 1 and 2 I have designated by the numeral 3 a port protector embodying features of the invention. This port protector is provided with a main or body portion 4 in the form of a hollow cylinder. This cylinder terminates at one end in a retaining ring portion 5, and at the other end in an outwardly flaring annular portion 6, which at its periphery joins an imperforate diaphragm portion 7. The portions referred to are preferably integral and the entire port protector device is preferably molded from a resilient composition material, such as rubber or similar flexible material.

The annular portion 6 is provided with a plurality of circularly spaced apertures 8. When the port protector is to be inserted into the exhaust port 10, it is distorted sufficiently so that the ring 5 and body 4 may be pressed into the port and then allowed to expand until they assume the position shown in Fig. 1. The exhaust port 10 is in most instances provided with an internal shoulder 9 against which the ring 5 will clamp in its expanded position, so that the port protector will be held firmly in the exhaust port 10. When in this position, the annular portion 6 will be drawn snugly against the surface immediately surrounding the port 10 so that communications between the passage 2 and the atmosphere which might be effected through the apertures 8 is normally closed.

It will be seen that with a port protector of the design described inserted in the exhaust port, the exhaust port is completely closed so that insects and foreign matter cannot enter the port. The port will thus be held closed until it is desired to have it open to permit fluid under pressure to be discharged therefrom.

In operation, when fluid is supplied to passage 2 under pressure, the pressure of the fluid is imposed on the inside surface of the diaphragm 7 and causes the diaphragm to be distended outwardly of the port 10, the diaphragm assuming the position somewhat as shown in Fig. 2. As the diaphragm 7 moves to this distended position, it separates the annular portion 6 from the surface contiguous to the port 10 and permits fluid under pressure in the passage 2 to escape to the atmosphere by way of the apertures 8.

It will be understood that since the diaphragm 7 and flared portion 6 are flexible any ice or dirt

which may collect on the outer surface of the diaphragm or which may tend to secure the flared portion 6 or diaphragm to the casing will be broken away when fluid under pressure is supplied to the passage 2, thus ensuring the proper operation of the protector.

It should be observed that the port protector device may be formed to suit any size or shape of exhaust port, and that it may be applied to existing valve devices or newly designed valve devices. Screw threads are shown in the exhaust port because they are frequently provided to give the user the option of piping the fluid pressure discharge to a remote point. It will readily be seen that these screw threads do not interfere with the application of the port protector, since the port protector provides its own securing means. Hence, the exhaust port need not be threaded in order to retain the port protector in applied position, nor are screws or other attaching devices required. This highly desirable adaptability of the port protector is further illustrated in Figs. 3 and 4.

Referring now to Figs. 3 and 4, I have illustrated in fragmentary form a valve device 11 having a discharge passage 12 and an atmospheric port 13 as in the valve device illustrated in Figs. 1 and 2. In addition, however, the mouth of the discharge port 13 is provided with a recess 17, wherein an annular chamfered seating surface 14 is disposed intermediate the outer end 15 and the inner end 16 of the recess. This valve device is representative of the design which would preferably be employed in new devices. It would protect the diaphragm portion of the port protector from driving rain, cleansing steam or flying bodies.

The port protector is distorted and applied to this modified form of valve device in the same manner as previously described in connection with Figs. 1 and 2. Fig. 3 illustrates the application of the port protector to this valve device, the several parts of the protector being shown in their normal position in which communication between apertures 8 and the atmosphere is closed by the engagement of the flared portion 6 with the chamfered area 14.

Operation in this adaptation is substantially the same as that previously described in connection with the adaptation illustrated in Figs. 1 and 2, the diaphragm 7 being distended in the same way and communication to atmosphere being established through the apertures 8 when the annular portion 6 is withdrawn from closing engagement with the chamfered area 14.

The protector when applied to this design of valve device will exclude entry of insects, dirt, water or other foreign matter just as effectively as when applied to the valve device shown in Figs. 1 and 2. Also, in its recessed position, the port protector is itself protected from rain, cleansing steam or flying bodies. In addition, the machined surface of the annular chamber provides an excellent sealing surface. There is also little likelihood of, or opportunity for, ice or mud to seal the diaphragm sufficiently to cause a failure of valve operation.

While only two embodiments of the improved port protector provided by this invention has been illustrated and described in detail, it should be understood that the invention is not limited to these details of construction, and that numerous changes and modifications may be made without departing from the scope of the following claims.

Having now described my invention, what I

claim as new and desire to secure by Letters Patent, is:

1. A port protector for an atmospheric passage in the body of a fluid pressure brake valve device, comprising, a diaphragm member of larger diameter than that of said passage and having its periphery turned inwardly upon itself, and a resilient fastening means joined to the inwardly turned portion of said diaphragm, said inwardly turned portion having a plurality of apertures therethrough disposed so as to be normally sealed against the body of said valve device and uncovered to permit venting when said diaphragm member is distended by internal fluid pressure.

2. A port protector for a fluid pressure brake valve device having in the body thereof an atmospheric passage, comprising, a hollow resilient cylindrical body, a resilient retaining ring joined to one end of said cylindrical body, an outwardly flaring annular portion joined to the other end of said cylindrical body, said outwardly flaring annular portion having a plurality of apertures circularly disposed therein, and an imperforate diaphragm joined at its periphery to the periphery of said annular portion.

3. A port protector for an atmospheric passage, in the body of a fluid pressure brake valve device, having an internal shoulder, comprising, a hollow resilient cylindrical body for interfitting with said passage, a resilient ring attached to one end of said cylinder and having sufficiently larger diameter than that of said cylinder to provide a secure purchase on said shoulder at the inner end of said passage, and a distensible discoidal member comprising two layers, the inner layer forming a thin annulus secured at its inner periphery to said cylinder, and the outer layer forming an imperforate diaphragm secured at its periphery to the outer periphery of said inner layer, said inner layer having a plurality of apertures therethrough disposed between its inner and outer peripheries, and said two layers being so formed as to hold said inner layer normally sealed against the body of said valve device and adapted to be disengaged therefrom to permit venting of said passage through said apertures when said discoidal member is distended by internal fluid pressure.

4. A port protector for a fluid pressure brake valve device having in the body thereof an atmospheric passage, said passage having the mouth thereof recessed, comprising, a hollow resilient cylindrical body interfitting with said passage, and terminating at one end in a resilient member extending radially outward from said cylindrical body, and terminating at the other end in a distensible discoidal member comprising two layers, the inner layer forming a thin annulus secured at its inner periphery to said cylindrical body, and the outer layer forming an imperforate diaphragm secured at its periphery to the outer periphery of said inner layer, said inner layer having a plurality of apertures therethrough disposed between its inner and outer peripheries, and said two layers being so formed as to hold said inner layer normally sealed against the area surrounding and immediately adjacent to said passage.

5. In combination, a fluid pressure brake valve device having in the body thereof a vent passage leading to atmosphere, said passage being adapted to receive a port protector by having the mouth thereof recessed, and a port protector, comprising a hollow resilient cylindrical body interfitting with said vent passage and terminating at one

end in an outwardly flaring resilient securing portion and terminating at the other end in a diaphragm having a diameter larger than that of said passage and a diameter smaller than that of said recessed mouth, and having its periphery turned inwardly upon itself and joined to said cylindrical body, said inwardly turned portion having a plurality of apertures therethrough and being formed to seal against and within the recessed portion of said vent passage, and to be disengaged therefrom to permit venting of said passage through said apertures to the atmosphere when said diaphragm member is distended by internal fluid pressure.

6. A protector for an exhaust passage of a fluid pressure device, comprising, a hollow sleeve portion open to said passage and secured to the device in sealing engagement with a wall of the passage, a hollow enlarged portion in open communication with the interior of the sleeve portion, said enlarged portion having exhaust openings formed therein leading to the exterior of the enlarged portion, the enlarged portion normally engaging the device to prevent ingress from the exterior to the interior of the enlarged portion,

said enlarged portion being deformable in response to the pressure of exhaust fluid from said passage to open communication between said openings and the atmosphere.

7. As an article of manufacture, a port protector for an exhaust passage of a fluid pressure device, comprising, a hollow deformable sleeve portion, a circumferentially larger deformable ring portion joined to one end thereof, and a hollow deformable enlarged portion joined to the other end thereof, and having an interior chamber communicating with the interior of said sleeve portion, and also having a series of apertures circularly disposed in the area adjacent said sleeve portion for providing communication between said chamber and the atmosphere.

8. As an article of manufacture, a port protector for the exhaust passage of a fluid pressure device, comprising a hollow member having a tubular portion adapted to be inserted in a port of the fluid pressure device and being formed to engage the wall thereof, and a perforate distensible bulb portion carried on one end of the tubular portion.

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