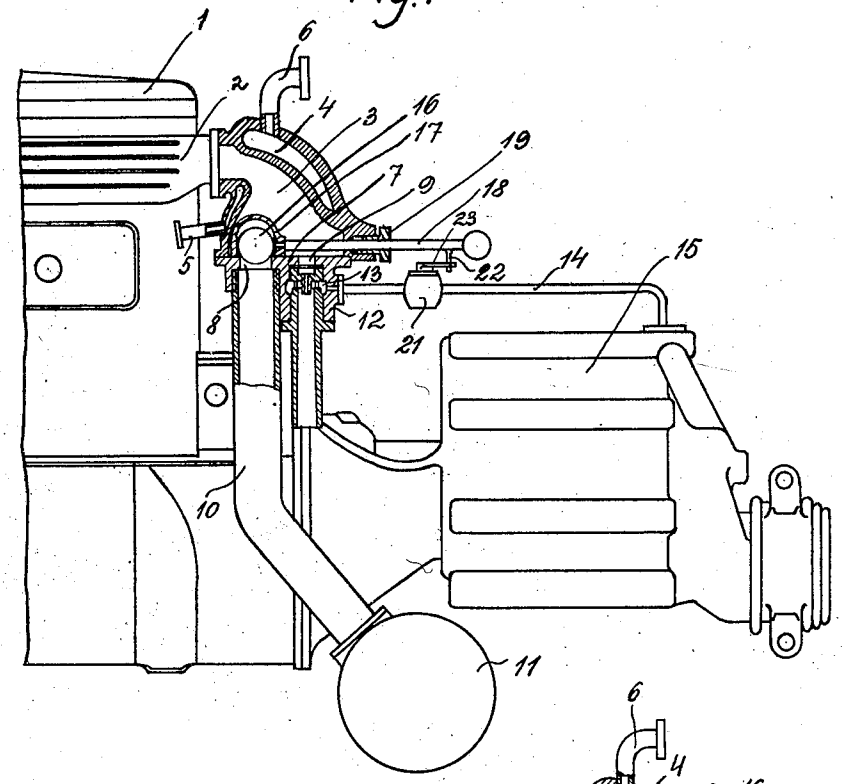
June 17, 1930. F. OBERASCHER 1,764,640

DEVICE FOR EVACUATING PUMPS

Filed June 19, 1928

Fig.1



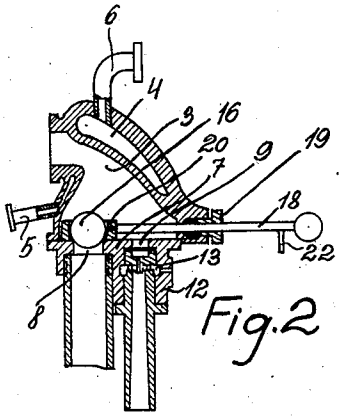


Fig.2

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DEVICE FOR EVACUATING PUMPS

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It has already been proposed to employ an ejector for evacuating rotary pumps, whereby the suction effect would be brought about by the flow energy of a current of exhaust gases coming from an internal combustion engine and passing through the ejector. In case of a pump forming part of the fire fighting outfit of a fire brigade motor vehicle, the exhaust gases of the motor itself may be used for actuating the ejector.

If such an evacuating device is to be designed so that the motor exhaust gases should be permitted to escape into the open without passing through the ejector, which is to be the case as soon as the pump is in regular operation, this can be done by providing a reversing organ, which alternatively opens the way through the ejector and closes the exhaust line or opens the exhaust line closing at the same moment the way through the ejector. This reversing device is subjected to the influence of the exhaust gases, which may damage same owing not only to their high temperature but also to their chemical properties. The heat of the gases may be reduced by sending same through a cooler before giving them access to the reversing device; the chemical constitution of the gases however, which may endanger the reversing device, cannot be altered.

The object of the present invention is, to design a reversing organ, which is qualified to withstand the noxious influences of the exhaust gases or to devise means for keeping the exhaust gases altogether away from the reversing organ. It is a further object of my invention to cool down the exhaust gases if necessary before their getting to the reversing organ at all.

All these aims are attained according to my invention by using a ball as reversing organ, which by means of a suitable mechanism is either placed on the opening leading to the exhaust line or on the opening from which the ejector branches off. This ball may also be covered by a bonnet connected to the mechanism, in which case the exhaust gases will not be allowed to come at all into contact with the ball. If required it is finally possible to equip the chamber housing the reversing organ with a cooling device.

Fig. 1 of the drawings attached illustrates in view and partly in section a mode of execution of the reversing organ, whilst another mode is shown in Fig. 2.

1 refers to a part of an internal combustion engine, the design of which is perfectly irrelevant with regard to the present invention. The exhaust branch 2 of the motor 1 is joined to a distribution chamber 3, which, in case the exhaust gases are to be cooled, will be provided with a cooling jacket 4 fitted with the branches 5 and 6 for the admission and the outlet of the cooling medium f. i. water. This distribution chamber 3 is closed by a plate 7 provided with two openings 8 and 9. The opening 8 is connected to the exhaust line 10 at the end of which a silencer 11 may be placed. The opening 9 of the plate 7 leads to the ejector 12, the suction channel 13 of which is connected by means of the tube 14 with the suction side of the pump 15 to be evacuated.

The distribution chamber 3 contains a ball 16 which is located in the interior of a bonnet 17, opening downwards. This bonnet is fixed to the end of a rod 18, which passes through the stuffing box 19 and protrudes out of the chamber 3. By shifting the rod 18 to and fro the ball 16 is alternatively placed over the opening 8 and over the opening 9, so that in the first case the exhaust gases are admitted into the ejector, the exhaust line 10 being closed, whilst in the other case the ejector 12 is closed and the gases are permitted to pass through the exhaust line 10.

It should be noted that with all these movements the ball 16 remains covered by the bonnet 17, so that it is not touched by the exhaust gases and is there kept free from any noxious influence. In many cases this protection afforded by the bonnet 17 is so effective, that the cooling jacket 4 can be done away with. The ball 16 may be made of metal or any other suitable material.

If the ball is made of a material sufficiently resistant against the chemical influences of the gases and also against their heat, no bonnet 17 is required and same is replaced by a ring 20 surrounding the ball as shown in Fig. 2.

The ball shape is of great advantage because the ball is turned with each shifting, so that in consequence the parts coming into contact with the edges of the openings 8 and 9 to be tightly closed, there are always others. This means that the parts of the ball surface subjected to the influence of the exhaust gases will continually change or in other terms that the whole surface will undergo a regular wear under the action of the gases, warranting thereby for a long period an absolute tight closing of the openings 8 and 9.

But the ball shape is also recommendable in case a bonnet according to Fig. 1 is made use of, as the displacement of the reversing organ from the one opening to the other is far more readily done with a ball than with a device of any other design.

If the pump 15 when starting is to be evacuated, the ball 16 is placed in the position shown in Fig. 1, whereby the ejector being opened the exhaust gases are permitted to pass through same. The evacuation takes place through the tube 14. As soon as the vacuum has reached the degree necessary for lifting the water through the suction tube up to the rotor of the pump, the regular operation of the pump is started and a further working of the ejector is superfluous. Then the rod 18 is drawn out bringing the ball 16 over the opening 9, so that the exhaust gases are permitted to escape into the open through the tube 10 and the silencer 11. Besides it is recommendable to shut off the tube 14 and for this purpose this tube is provided with a cutting off organ f. i. a cock 21, which is closed as soon as the evacuation is completed. It is possible to join the moving part of the cutting off device 21, to the rod 18 used for displacing the ball 16 f. i. by a pin 22 engaging in a slit of the arm 23 fixed to the moving part of the cut off device, such as shown in our illustration. This joint is so designed that at the moment in which the ball closes the opening 8, the cut off 21 is opened, whilst it is closed vice-versa as soon as the ball has reached its position over the opening 9, so that the tube 14 opens or shuts automatically, when the reversing organ 16 is displaced.

It goes without saying that the device may be executed in different manners: it is f. i. possible to substitute the rod 18 and the device for displacing the ball 16 by any other suitable control device.

What I claim is:

1. In an evacuating device for pumps the combination of a pump, an ejector, the suction room of which is connected to the suction side of the pump, an internal combustion engine having an exhaust branch, an exhaust line for the internal combustion engine, a distribution chamber between the exhaust branch of the internal combustion engine and the exhaust line, said distribution chamber being provided with two outlets, the one leading to the ejector and the other to the exhaust line, a ball designed for alternately closing one and the other of said outlets, and a device for moving the ball from one outlet to the other and vice versa.

2. In an evacuating device according to claim 1 the feature that the device for moving the ball to and fro consists of a ring surrounding the ball and a mechanism for displacing this ring, said mechanism being adapted to be operated from outside of the distribution chamber.

3. In an evacuating device according to claim 1 the feature that the device imparting to the ball a motion to and fro consists of a bonnet covering the ball and protecting it from the oncoming exhaust gases, and a mechanism for displacing this bonnet, said mechanism being adapted to be operated from outside of the distribution chamber.

4. In an evacuating device for pumps the combination of a pump, an ejector, the suction room of which is connected to the suction side of said pump, an internal combustion engine having an exhaust branch, an exhaust line for the internal combustion engine, a distribution chamber between the exhaust branch of the internal combustion engine and the exhaust line, said distribution chamber being provided with a cooling device for cooling the exhaust gases and besides with two outlets placed side by side, the one of said outlets leading to the ejector and the other to the exhaust line, a ball designed for alternately closing one of the two said outlets, and a device for moving the ball from one outlet to the other and vice versa.

5. In an evacuating device according to claim 4 the feature that the device for moving the ball to and fro consists of a ring surrounding the ball and a mechanism for displacing this ring, said mechanism being adapted to be operated from outside of the distribution chamber.

6. In an evacuating device according to claim 4 the feature that the device imparting to the ball a motion to and fro consists of a bonnet covering the ball and protecting it from the oncoming exhaust gases, and a mechanism for displacing this bonnet, said mechanism being adapted to be operated from outside of the distribution chamber.

7. In an evacuating device for pumps the combination of a pump, an ejector, the suction room of which is connected to the suction side of the pump, an internal combus-

tion engine having an exhaust branch, an exhaust line for the internal combustion engine, a distribution chamber between the exhaust branch of the internal combustion engine and the exhaust line, said distribution chamber being provided with two outlets, the one leading to the ejector and the other to the exhaust line, a ball designed for alternately closing one and the other of said outlets, a device for moving the ball from one outlet to the other and vice versa, a shut off device inserted into the conduit between the suction room of the ejector and the suction side of the pump and means for connecting the said shut off device to the mechanism for moving the ball in such manner that said shut off device is opened when the said exhaust line is closed by the ball and vice versa is closed when the exhaust line is opened.

8. In an evacuating device according to claim 7 the feature that the device for moving the ball to and fro consists of a ring surrounding the ball and a mechanism for displacing this ring, said mechanism being adapted to be operated from outside of the distribution chamber.

9. In an evacuating device according to claim 7 the feature that the device imparting to the ball a motion to and fro consists of a bonnet covering the ball and protecting it from the oncoming exhaust gases, and a mechanism for displacing this bonnet, said mechanism being adapted to be operated from outside of the distribution chamber.

In testimony whereof I affix my signature.

FRANZ OBERASCHER.