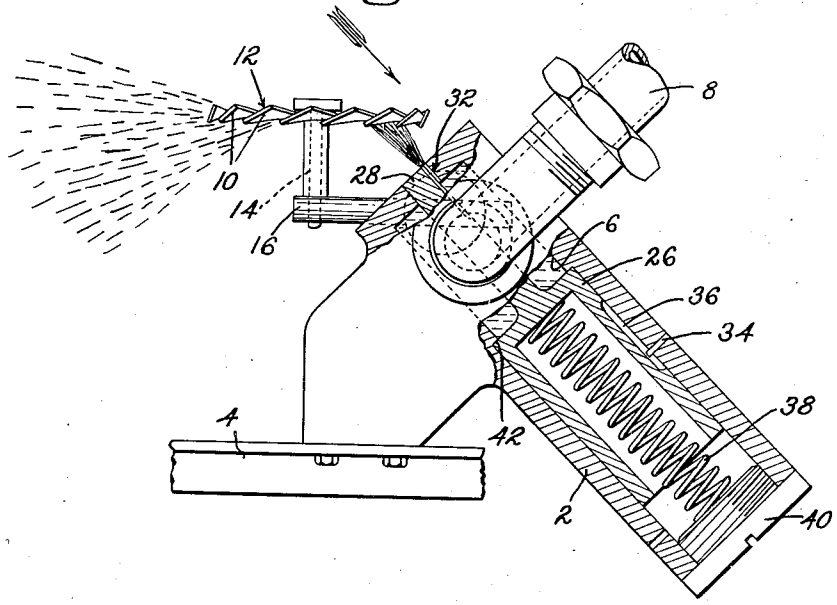
Oct. 28, 1941. L. H. CUSHMAN 2,260,301

FLUID DELIVERY DEVICE

Filed Dec. 29, 1939

Fig:1.



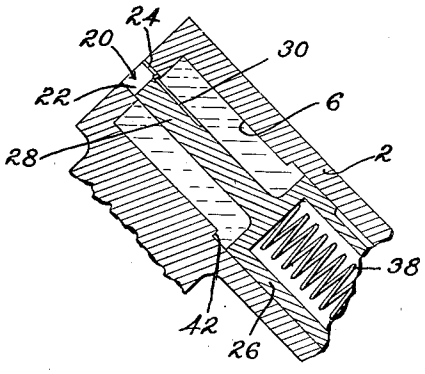
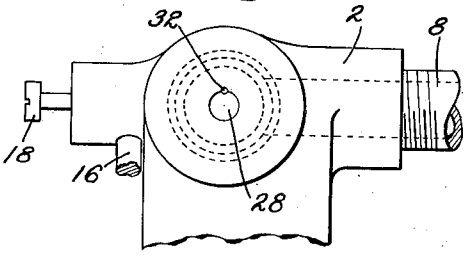


Fig:2.

Fig:3.



INVENTOR
Lee H. Cushman
By his Attorney
Victor Cobb

Patented Oct. 28, 1941

2,260,301

UNITED STATES PATENT OFFICE

2,260,301

FLUID DELIVERY DEVICE

Lee Harold Cushman, Hamilton, Mass., assignor to United Shoe Machinery Corporation, Borough of Flemington, N. J., a corporation of New Jersey

Application December 29, 1939, Serial No. 311,628

2 Claims. (Cl. 299—59)

This invention relates to fluid delivery devices from which fluid is delivered in a jet or spray, and is herein illustrated as embodied in a device for delivering a jet of oil for lubricating purposes. It will be recognized, however, that the invention is not limited to lubricating means, but is adapted for various uses.

An object of the invention is to insure that if an orifice through which fluid is delivered becomes wholly or partially obstructed by dirt or other foreign matter, the orifice will be immediately cleared to permit normal delivery of the fluid. To this end, the construction herein shown comprises a casing provided with a chamber which receives fluid under pressure and having an orifice through which the fluid is delivered from the chamber, and a member which extends into and partially closes the orifice in contact with the wall thereof during normal delivery of the fluid but is moved automatically in the direction to withdraw it from the orifice in response to increase in the pressure of the fluid in the chamber if there is any obstruction to the normal delivery of the fluid. Such movement of the member may serve to dislodge any foreign matter in or adjacent to the orifice, or its movement may continue until an enlarged opening is provided through which the foreign matter will be discharged. When the orifice is cleared, the member is immediately returned by a spring to its normal position.

The invention will now be more particularly described with reference to the accompanying drawing and thereafter pointed out in the claims.

In the drawing,

Fig. 1 is a view partly in elevation and partly in vertical section of a device in which the invention is embodied, showing the parts as they appear during normal delivery of the oil;

Fig. 2 is a view also in vertical section of a portion of the device, illustrating conditions when delivery of the oil is obstructed; and

Fig. 3 shows the device as viewed in the direction of the arrow in Fig. 1, a portion of the structure being broken away.

The device comprises a casing **2** which, for the purpose of lubricating parts of a machine, is adapted to be mounted in an enclosure where such parts are located, the drawing showing a portion **4** of the frame of such a machine on which the casing is secured. Within the casing **2** is a chamber **6** into which lubricating oil is forced through a pipe **8** from a suitable pump (not shown), and oil issuing from this chamber in the form of a jet is arranged to strike blades **10** formed on a wheel **12** to cause the wheel to rotate and disperse the oil about the enclosure in which the device is located, so that oil will be deposited on the parts to be lubricated. The wheel **12** is mounted to turn freely about a pin **14** supported by an arm **16** which is secured by a set screw **18** in an opening in the casing **2**.

To permit delivery of oil from the chamber **6** the casing **2** is provided with an orifice **20** (Fig. 2) which includes a substantially cylindrical hole **22** and a small slot **24** at one side of this hole. Slidingly mounted in the casing is a plunger **26** which serves as one end wall of the chamber **6** and has extending therefrom a pin **28** formed substantially to fit in the hole **22** while freely movable in the hole. Formed in one side of the pin **28** is a slot **30** which is opposite the slot **24** in the casing **2**, so that the two slots cooperate to provide a restricted channel or passage **32** (Fig. 3) through which the jet of oil issues when the pin **28** is in the hole **22**. The slot **30** is maintained in the right relation to the slot **24** by a pin **34** (Fig. 1) which projects from the casing **2** into a slot **36** in the plunger **26** and thus prevents the plunger from turning. A spring **38** bearing at one end on the plunger **26** and at the other end on a screw **40** threaded in the lower end of the casing **2** holds the plunger at all times during normal delivery of the oil in a position determined by its engagement with a shoulder **42** on the casing, as illustrated in Fig. 1. The pin **28** is thus positioned in the orifice **20** and partially closes the orifice while in contact with the wall thereof, permitting the oil to be delivered through the restricted channel **32**. Should any dirt or other foreign matter wholly or partially obstruct this channel and thus prevent normal delivery of the oil, the pressure of the oil in the chamber **6** increases, and such increase in the pressure serves to move the plunger **26** against the resistance of the spring **38** in the direction to withdraw the pin **28** from the orifice **20**, as illustrated in Fig. 2. In such movement the pin may act frictionally to dislodge the foreign matter obstructing the flow of the oil, or the movement of the pin may continue until it is withdrawn from the orifice so that the foreign matter will be discharged through the enlarged opening thus provided. As soon as normal flow of the oil through the channel **32** is again permitted, the plunger **26** is returned by the spring **38** to its normal position by reason of the decrease in the pressure of the oil in the chamber **6**. Insurance is thus afforded against anything more than a momentary cessation of the normal delivery of the oil.

Having described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a fluid-delivery device, a casing having therein a chamber to receive fluid under pressure and provided with an orifice through which fluid is delivered from said chamber, a plunger movable in said casing in engagement with the side walls thereof, and a member arranged to extend from said plunger outwardly into said orifice in contact with the wall of the orifice nearly all around the member during the normal delivery of the fluid, said member and the orifice being so formed as to provide at one side only of the member a restricted passage for the fluid when the member is thus located in the orifice, the member being movable inwardly by the plunger in the direction to withdraw it from the orifice in response to increase in the pressure of the fluid in said chamber in the event of an obstruction to the normal delivery of fluid through said passage.

2. In a fluid-delivery device, a casing having therein a chamber to receive fluid under pressure and provided with an orifice through which fluid is delivered from said chamber, a plunger movable in said casing in engagement with the side walls thereof and provided with a pin arranged to extend from said chamber outwardly into said orifice in contact with the wall of the orifice during the normal delivery of the fluid, said pin and the wall of the orifice having slots registering with each other to provide a restricted passage for the fluid at one side only of the pin when the pin is thus located in the orifice, and a spring for holding the plunger in its normal position, the plunger being movable against the resistance of said spring in the direction to withdraw the pin inwardly from the orifice in response to increase in the pressure of the fluid in said chamber in the event of an obstruction to the normal delivery of fluid through said passage.

LEE HAROLD CUSHMAN.