Dec. 11, 1945. E. W. DAVIS 2,390,781

LUBRICANT COMPRESSOR

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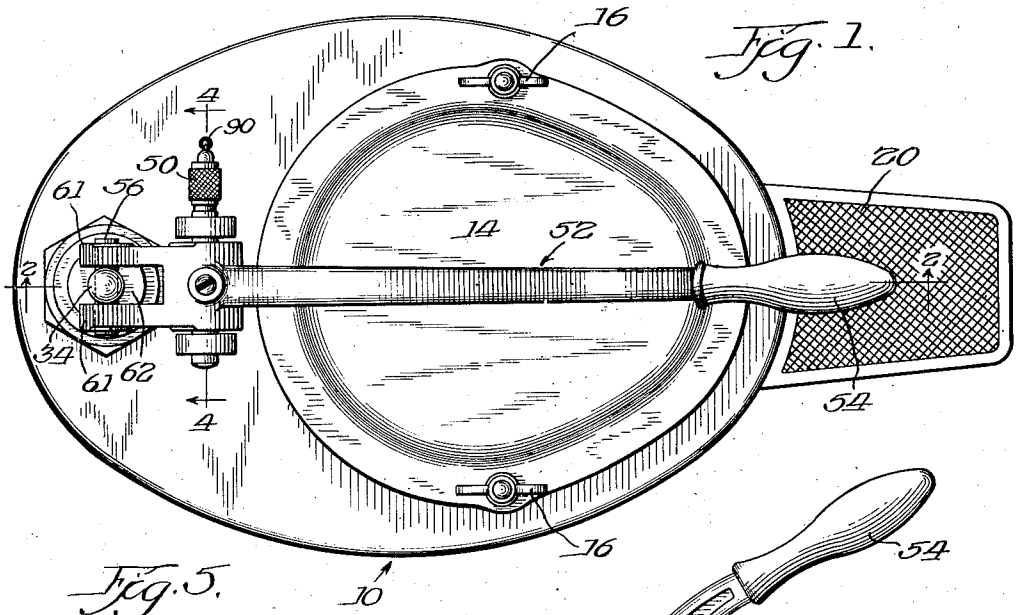

Fig. 1.

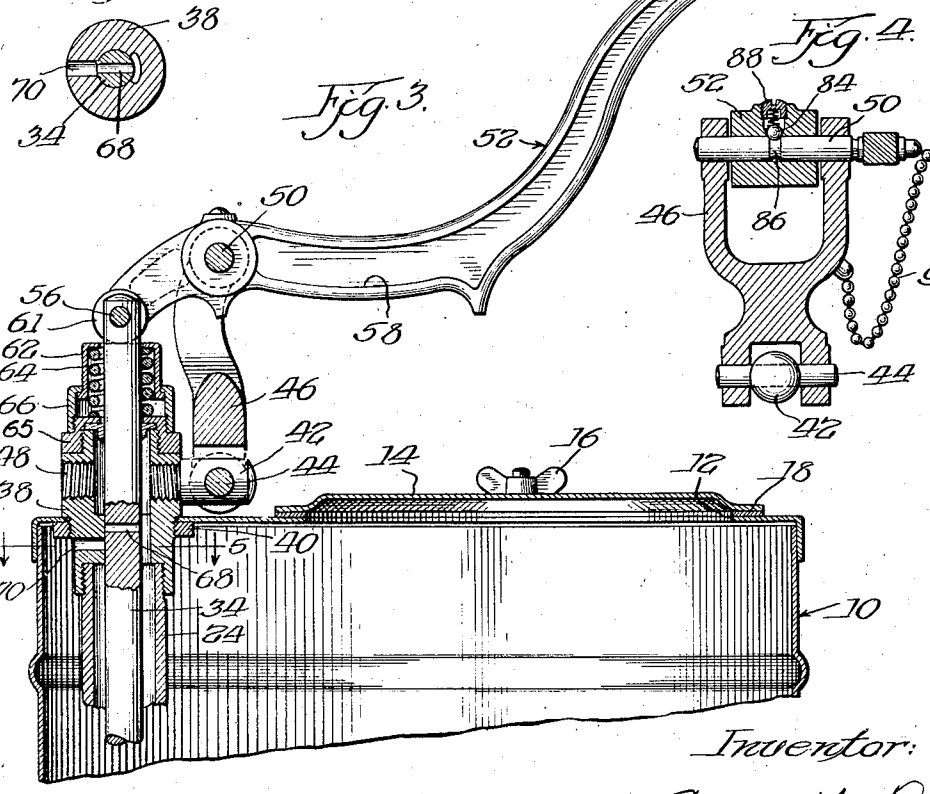

Fig. 3.

Fig. 5.

Fig. 4.

Inventor:
Ernest W. Davis

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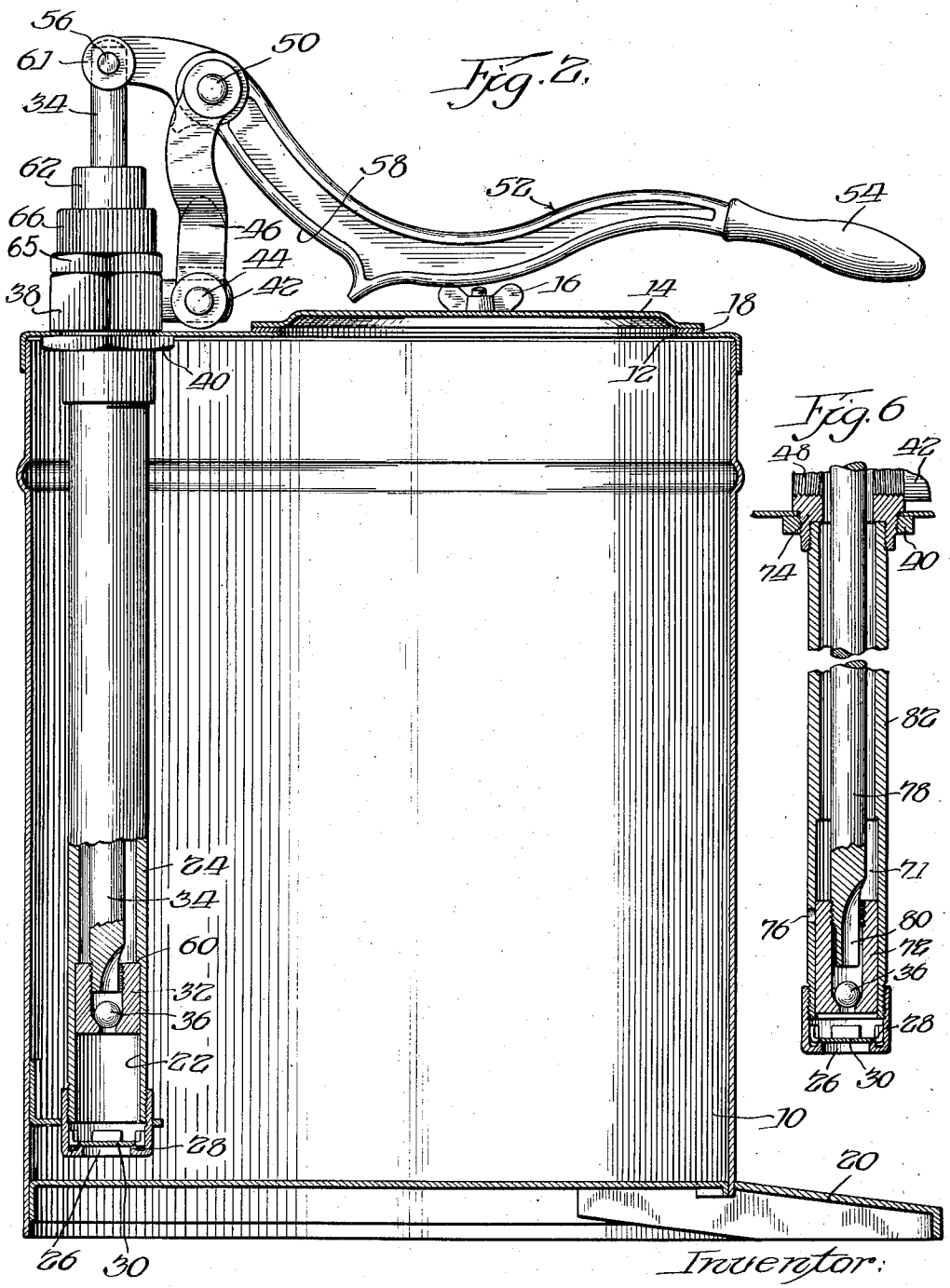

Inventor:

Ernest W. Davis

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2,390,781

LUBRICANT COMPRESSOR

Ernest W. Davis, River Forest, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill., a corporation of Virginia

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2 Claims. (Cl. 222—318)

My invention relates to lubricant compressors, and more particularly to hand operated lubricant compressors wherein it is desirable to release the pressure in the discharge conduit after each lubricating operation. A compressor of this type is disclosed in my U. S. Patent No. 2,172,136, of which the present invention is an improved design.

A compressor of this type is ordinarily provided with a flexible, high-pressure, lubricant hose, one end of which is connected to the discharge outlet of the compressor. The other end of the hose is ordinarily provided with a detachable coupling adapted for successive connection with numerous lubricant fittings attached to bearings requiring lubrication. The lubrication of some bearings requires considerable pressure, so that the residual pressure remaining in the hose after the coupling is removed from a fitting, may tend to cause objectionable oozing and dripping of lubricant from the coupling during the operation of transferring the coupling from one fitting to another.

The primary object of the present invention is to provide efficient means for releasing this residual pressure immediately before the coupling is removed from a fitting and thereby prevent the objectionable oozing and dripping.

A more specific object is to provide a compressor of the type described in which movement of a single handle will either increase or decrease the pressure of the lubricant in the discharge conduit, in accordance with the choice of the operator, and by operations which enables the operator to release the pressure without releasing his grip on the handle.

Another object is to devise a compressor with this single handle, dual control, and having means for providing "bi-sensual" indication of abnormal movement of the handle, as will be explained hereinafter.

Another object is to provide a compressor of the class described which may be loaded with lubricant in a convenient manner.

A further object is to provide an efficient compressor of the class described which comprises few parts, which can be manufactured at low cost, which can be assembled or disassembled without difficulty, and which avoids the use of intricate or delicate mechanism in its construction. These and other objects will appear as the description proceeds.

In the drawings:

Figure 1 is a plan view of the improved compressor;

Figure 2 is a sectional elevation on the line 2, 2, in Figure 1, and illustrates the compressor with the handle in its extreme lowermost position;

Figure 3 is a sectional elevation the same as Figure 2 except that the handle is shown in its uppermost pumping position. Movement of the handle to an "abnormal position" slightly higher than that shown in Figure 3 will be described hereinafter;

Figure 4 is a partial section through the line 4, 4 in Figure 1;

Figure 5 is a partial section on the line 5, 5 in Figure 3;

Figure 6 is a longitudinal, sectional elevation of a modified construction of the pumping mechanism illustrated in Figure 2 and Figure 3.

The lubricant reservoir 10 is provided with a loading opening 12, which is normally covered by the cover plate 14, held in position by the wing nuts 16, 16, and sealed against leakage by the gasket 18. The foot pad 20 affords means for applying pressure of an operator's foot for the purpose of preventing displacement of the compressor during pumping operations.

The pump cylinder 22 is formed with required accuracy by reaming the discharge conduit 24, and is supplied with lubricant from the reservoir 10 through the opening 26 in the valve seat 28. The check valve 30 prevents reverse flow of lubricant. The piston 32, Figure 2, is screwed to the piston rod 34, and is provided with the ball check 36 to produce unidirectional flow of lubricant through the piston 32.

The discharge conduit 24 screws into the head 38, which is secured to the top of the reservoir 10, by the lock nut 40. The stud 42 is screwed forcibly into the head 38 before being cross drilled for the pin 44, which forms a fulcrum for the yoke 46. The head 38 is tapped at 48 to provide means for attaching a high pressure hose (not shown), the construction of which is familiar to those skilled in the art.

The yoke 46 carries the pivot pin 50, which passes through the hand lever 52 and acts as a pivot, about which the hand lever 52 may be oscillated by reciprocating motion of the handle 54. The piston rod 34 is connected with the hand lever 52 by means of the piston-rod pin 56. The hand lever 52 is provided with an auxiliary handle portion 58, by means of which the compressor may be carried about while the hand lever is in the position illustrated in Figure 3.

When the hand lever 52 occupies the position illustrated in Figure 2, downward movement of

the handle 54 is prevented by the engagement of the piston 32 with the shoulder 60 at the top of the cylinder 22. When the hand lever 52 occupies the position illustrated in Figure 3, the engagement of the bosses 61, 61 with the stop 62 tends to limit the upward movement of the handle 54. The stop 62 is urged upwardly by the strong spring 64, which is held under high initial compression by the bushing 66.

If sufficient upward force is applied to the handle 54 to further compress the spring 64, the handle 54 may be moved to an "abnormal position" slightly higher than the position illustrated in Figure 3. When the handle 54 occupies this "abnormal position" the lower edge of the stop 62 engages the upper surface of the bushing 65 to limit the upward movement of the handle 54, and in this position, the hole 68 in the piston rod 34 registers with the pressure-release opening 70, whereby pressure in the discharge conduit 24 is released through the pressure release opening 70.

In order to distinguish clearly the various positions and movements of the handle 54, the positions shown in Figure 2 and Figure 3, and all positions therebetween, will be designated hereinafter as "normal positions," to differentiate from the "abnormal position" described above; and movement between the positions illustrated will be designated as "pumping movement" to differentiate from the "abnormal movement" by which the handle 54 is moved to its "abnormal position."

In the modified construction illustrated in Figure 6, the cylinder 71 and piston 72 are each made somewhat longer than shown in Figure 2. The pressure release opening is omitted in the head 74, and a vent 76 is made in the cylinder 71. The piston rod 78 is provided with the extension 80 for limiting the upward movement of the ball check 36. The position of the piston 72, as shown, corresponds with the position of the handle 54 as shown in Figure 3. In this position the vent 76 is closed by the piston 72, but when the handle 54 is moved upwardly to its abnormal position, the piston 72 will be moved downwardly to uncover the vent 76, and release the pressure in the discharge conduit 82, as will be readily understood.

The pivot pin 50 is detachably secured in the hand lever 52 by means of a steel ball 84, which is yieldingly held in the groove 86, by means of the spring 88. The pivot pin 50 is removed from the hand lever 52, and allowed to hang from the chain 90 when it is necessary to reload the reservoir. This permits swinging the hand lever 52 clear up and out of the way, so as to facilitate loading by not obstructing the loading opening 12.

In operating this compressor, the coupling on the flexible hose (not shown) is attached to a fitting on a bearing requiring lubrication, and the handle 54 is moved up and down throughout its normal positions until the required amount of lubricant has been discharged into the bearing. The operator, with his foot still held down on the foot pad 20, then pulls the handle 54 upwardly as far as it will go, to the abnormal position previously described, thereby releasing the pressure in the discharge conduit 24 and in the flexible hose. With the hose released of its pressure, the coupling then may be removed from one fitting and applied to another without any oozing or dripping of lubricant from the coupling.

When bearings are grouped in close proximity to each other, the operator is enabled to lubricate several bearings without moving the compressor, or without releasing his grip on the handle. This is done by merely holding the coupling on a fitting with one hand, and then pumping the desired amount of lubricant into the bearing with the other hand, after which the operator releases the pressure by pulling up on the handle, and changes the coupling to another fitting to repeat the procedure.

An inexperienced operator may find it convenient to observe the downward movement of the bosses 61, 61 as they approach and contact the stop 62, so as to know when to reverse the upward movement of the handle 54, but after a little practice he recognizes the feel of the contact by the increased load on the handle, and he can then devote his entire visual attention to the manipulation of the coupling. This "bisensual" indication of the contact is thus advantageous to both the experienced and the inexperienced operator.

I claim:

1. In a lubricant compressor having a lubricant reservoir, the combination of a cylinder receiving lubricant from the reservoir, a piston longitudinally movable within said cylinder, a piston rod for said piston, a single manually operable means for imparting longitudinal reciprocatory movement to said piston rod and said piston thereby to apply pressure to the lubricant in said cylinder, a lubricant discharge conduit surrounding said piston rod and receiving lubricant from said cylinder, said conduit having a pressure release opening therein, means including a portion of said piston rod covering said pressure release opening throughout said pumping movement and uncovering said pressure release opening upon abnormal additional longitudinal movement of said piston rod, said manually operable means being selectively operable to impart either said pumping movement or said abnormal movement to said piston rod, and means for applying a substantial resistive force opposing abnormal movement of said piston rod.

2. In a lubricant compressor having a lubricant reservoir, the combination of pumping mechanism for pumping lubricant from the reservoir, said pumping mechanism comprising a reciprocable piston rod and a discharge conduit surrounding said piston rod, said discharge conduit having a port communicating freely with the reservoir, and said piston rod having an aperture capable of connecting said conduit with said port, a single handle operatively connected to said piston rod to reciprocate the latter, and resilient means to prevent movement of said piston rod to a position in which the aperture in said rod is in communication with said port, said resilient means yielding upon application of a force manually applied to said handle and offering sufficient resistance to such movement of said handle to apprise the operator of one of the limits of the normal operating stroke of said piston rod and handle.

ERNEST W. DAVIS.