March 18, 1924. 1,487,650

L. FRIEDMANN

LUBRICATING OIL PUMPING APPARATUS

Filed April 25, 1922

Fig. I

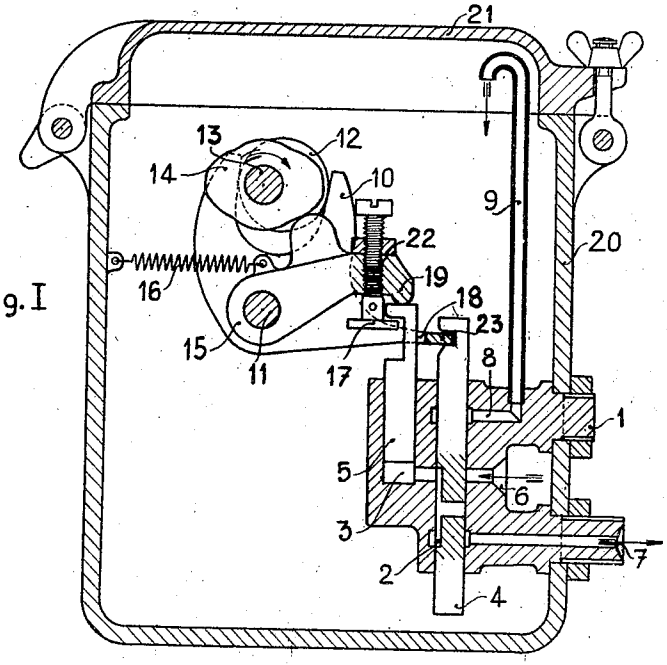
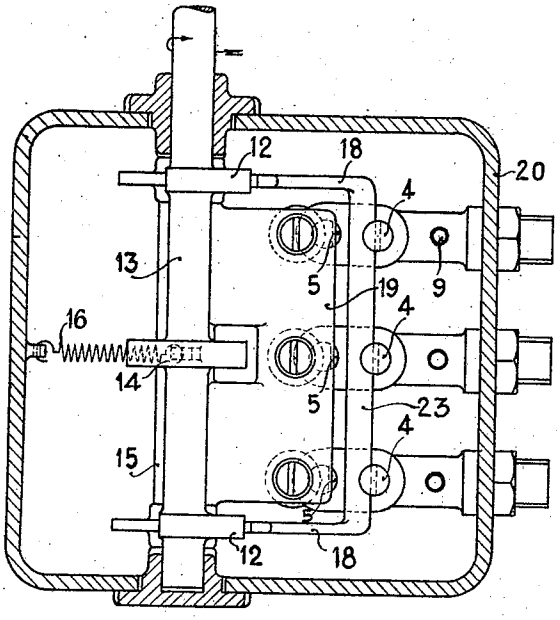


Fig. II



Inventor
L. Friedmann
By Marks & Clerk
Attys.

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UNITED STATES PATENT OFFICE.

LOUIS FRIEDMANN, OF VIENNA, AUSTRIA.

LUBRICATING-OIL-PUMPING APPARATUS.

Application filed April 25, 1922. Serial No. 556,425.

To all whom it may concern:

Be it known that I, LOUIS FRIEDMANN, a citizen of the Republic of Austria, resident of Vienna, Austria, have invented certain new and useful Improvements in Lubricating-Oil-Pumping Apparatus, of which the following is a specification.

This invention has for its object to provide an improved valveless lubricating oil pumping apparatus for lubricating the internal parts of a locomotive which are under steam pressure. This apparatus comprises two cylinders located in a common casing. These cylinders, hereinafter designated the pumping cylinder and the distributing cylinder respectively, comprise each a corresponding piston and the motion of the two pistons is such that the pumping piston makes twice as many strokes as the distributing piston, thus enabling two oil ducts to be supplied with oil alternately.

In the improved apparatus one of these two oil ducts leads to a place of consumption, that is to say, the part which is to be lubricated. The other of these two oil ducts opens into a pipe which is located in the oil vessel and which delivers into the interior of the said oil vessel, and in fact at the upper part of the same beneath the lid of said oil vessel.

If this lid be removed and the pumping apparatus be started it will then be possible to perceive the oil passing out from the aforesaid pipe located in the oil vessel so that it can be seen whether the pump is working. By reason of the fact that the aforesaid pipe delivering into the oil vessel is located under the fastening of the lid the said pipe is effectually prevented from being bent or otherwise damaged.

Since the point of consumption or part to be lubricated is usually under a high steam pressure the outlet leading to the said point or part must consequently overcome a much greater pressure than the outlet delivering into the oil vessel and therefore, if the qualities of oil delivered into the oil vessel are not to be much greater than the quantities of oil pumped to the point of consumption, the dead space under the pumping piston must be made as small as possible because even though oil is incompressible the oil will yet contain small quantities of air which diminish in volume when the oil is compressed; consequently if the stroke of the pumping piston is made variable the dead space must not become greater when the piston stroke is diminished.

In this lubricating oil pumping apparatus there is employed a regulating mechanism whereby the pumping piston is always pushed to an equal distance into the cylinder whereas the stroke of the piston from out of the cylinder can be made greater or smaller according to the adjustment of the regulating mechanism.

An embodiment of the invention is illustrated by way of example in the accompanying drawings, in which:—

Figure 1 is a longitudinal section of the improved pumping apparatus, and

Figure 2 is a cross-section thereof.

In Figure 1: 1 is the pump casing containing the distributing cylinder 2 for the distributing piston 4; and the pumping cylinder 3 for the pumping piston 5; 6 is the admission duct for the admission of the oil; 7 is an exit duct for the exit of the oil on its way to the point of consumption or part to be lubricated; 8 is an exit duct for the delivery of the oil into the oil vessel by way of the pipe 9 which opens into the upper part of the said oil vessel.

According to the position of the distributing piston 4 the cylinder space 3 is placed during the delivery stroke in connection with the duct 7 and duct 8 alternately. The motion of the two pistons is produced by means of two rocking levers both mounted on the shaft 11. Of these two levers, the lever 10 is connected by means of its arm 18 to the distributing piston 4 while its other arm has a bell-shaped recess in which engages an eccentric 12. This eccentric is fixed to a shaft 13; on the same shaft 13 there is mounted and fixed to it a double tappet 14 which is adapted to press downwardly and positively on a lever 15 that is mounted on the shaft 11. A means such as a spring 16 is provided for moving the lever back in a reverse direction. On the end 19 of the lever 15 is an adjusting screw 22 which may be fixed by a nut 22^a and is provided at its lower end with a head 17 engaging a recess 5^a in the pumping piston 5. This recess 5^a is of such length as to permit a limited longitudinal movement of the head 17 with respect to the piston 5. When the screw 22 is screwed downwardly with the piston 5 in its uppermost position, the head 17 is displaced from the upper terminal of the recess 5^a and thus, subsequent to the

depression of the piston by the lever end 19, the head 17 moving freely in the recess 5^a during a portion of its upward movement, will reduce the up-stroke of the piston in proportion to the displacement of the head 17 from its normal position as indicated in Figure 1. In this manner, the length of the stroke of the piston 5 may be varied as desired, although it will be noted that the variation only effects the limit of the upward movement of the piston, whereas the limit of the downward movement thereof remains the same regardless of the adjustment of the screw 22. When the shaft 13 is rotated, the two levers 10 and 15 will rock in such a manner that in a complete revolution of the shaft 13 the arm 18 actuating the distributing piston will make one to-and-fro rocking movement whereas the arm 19 will make two to-and-fro rocking movements. During this motion the pumping piston 5 will be pushed into its cylinder always to one and the same extent, whereas it will be pushed out of the cylinder to a lesser or greater extent according as the amount of play between the parts 17 and 19 is greater or smaller.

When the apparatus contains a plurality of lubricating pumps as illustrated in Figure 2 it is advisable to employ for actuating the distributing piston two levers 18 which are connected together by a bar 23 and engaged correspondingly with the piston. For actuating these levers it is advisable in this case to employ two eccentrics 12.

What I claim is:—

1. In a lubricating oil pumping apparatus, the combination of an oil vessel fitted with a lid, an oil pump comprising a pumping cylinder and piston, a distributing cylinder and piston, oil conducting means connecting said pumping and distributing cylinders, said distributing cylinders having an oil admission duct and two oil delivery ducts, one of said oil delivery ducts leading to a place of consumption, and a pipe for receiving oil from another of said oil delivery ducts and delivering said oil underneath said lid into said oil vessel, and means for actuating said pistons comprising a shaft, two rocking levers on said shaft, an eccentric for actuating one of said two rocking levers for operating said distributing piston, and a double tappet for actuating the other of said two rocking levers for operating said pumping piston.

2. In a lubricating oil pumping apparatus, the combination of an oil vessel fitted with a lid, an oil pump comprising a pumping cylinder and piston, a distributing cylinder and piston, oil conducting means connecting said pumping and distributing cylinders, said distributing cylinders having an oil admission duct and two oil delivery ducts, one of said oil delivery ducts leading to a place of consumption, and a pipe for receiving oil from another of said oil delivery ducts and delivering said oil underneath said lid into said oil vessel, and means for actuating said pistons comprising a shaft, two rocking levers on said shaft, an eccentric for actuating one of said two rocking levers for operating said distributing piston, and a double tappet for actuating the other of said two rocking levers for operating said pumping piston, an adjustable member located on the end of said other rocking lever for operating said delivering piston, and means for connecting said other rocking lever to said delivering piston in such a manner that said adjustable member shall move said delivering piston out of its cylinder, whereas said other rocking member will force it into its cylinder.

3. In a lubricating oil pumping apparatus, the combination of an oil vessel fitted with a lid; a plurality of oil pumps each comprising a pumping cylinder and piston, a distributing cylinder and piston, oil conducting means duct connecting said pumping and distributing cylinders, said distributing cylinders having an oil admission duct and two oil delivery ducts, one of said oil delivery ducts leading to a place of consumption, and a pipe for receiving oil from another of said oil delivery ducts and delivering said oil underneath said lid into said oil vessel; means for actuating said plurality of pumping pistons, comprising a shaft, a rocking lever on said shaft, and a double tappet for actuating said rocking lever for operating said plurality of pumping pistons; and two rocking levers on said shaft, connected by a connecting bar for operating said plurality of distributing pistons.

In testimony whereof I have signed my name to this specification.

LOUIS FRIEDMANN.

Witnesses:

CARL SONDENBERG,

HEINRICH MISCHKOVICH.