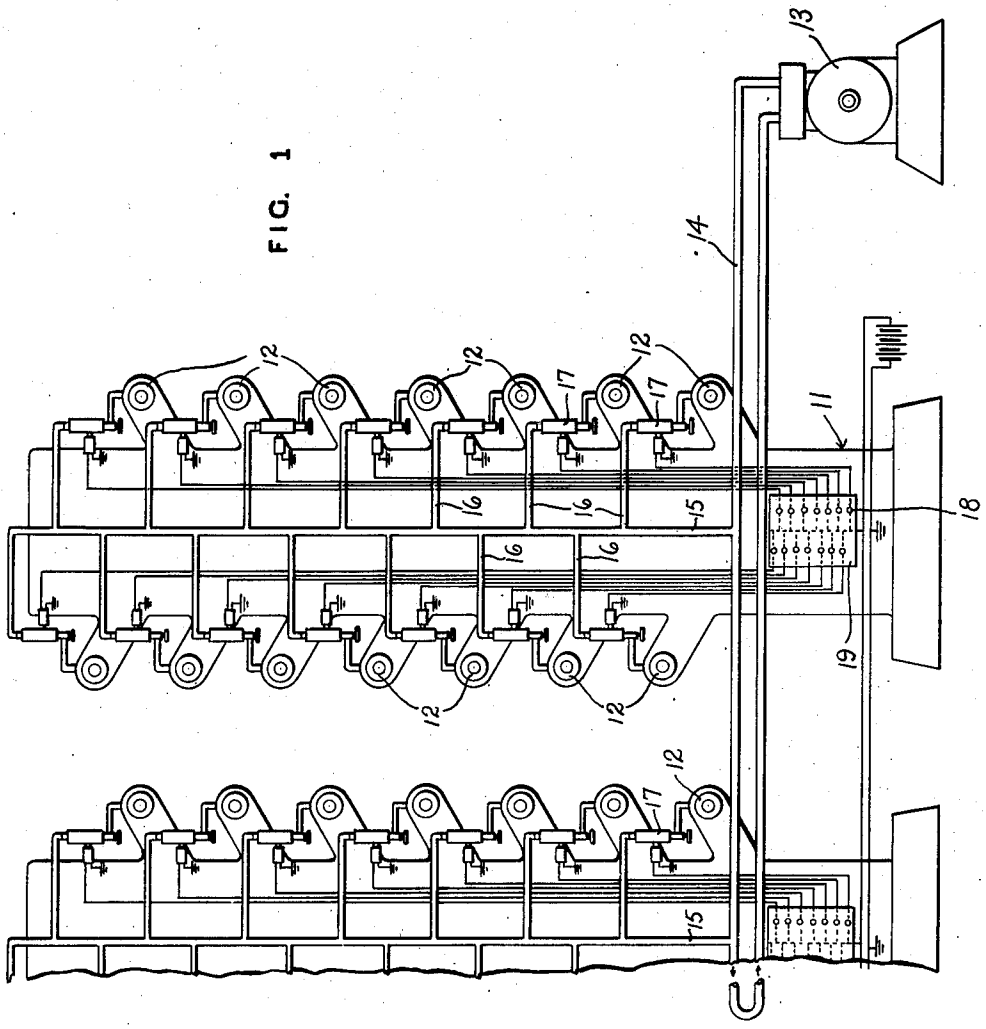
April 26, 1949. H. H. MATHEWS, SR 2,468,219

LUBRICATION INDICATOR

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FIG. 1



INVENTOR
HOWARD H. MATHEWS, SR.

BY McMorrow, Berman and Davidson

ATTORNEYS.

April 26, 1949. H. H. MATHEWS, SR 2,468,219

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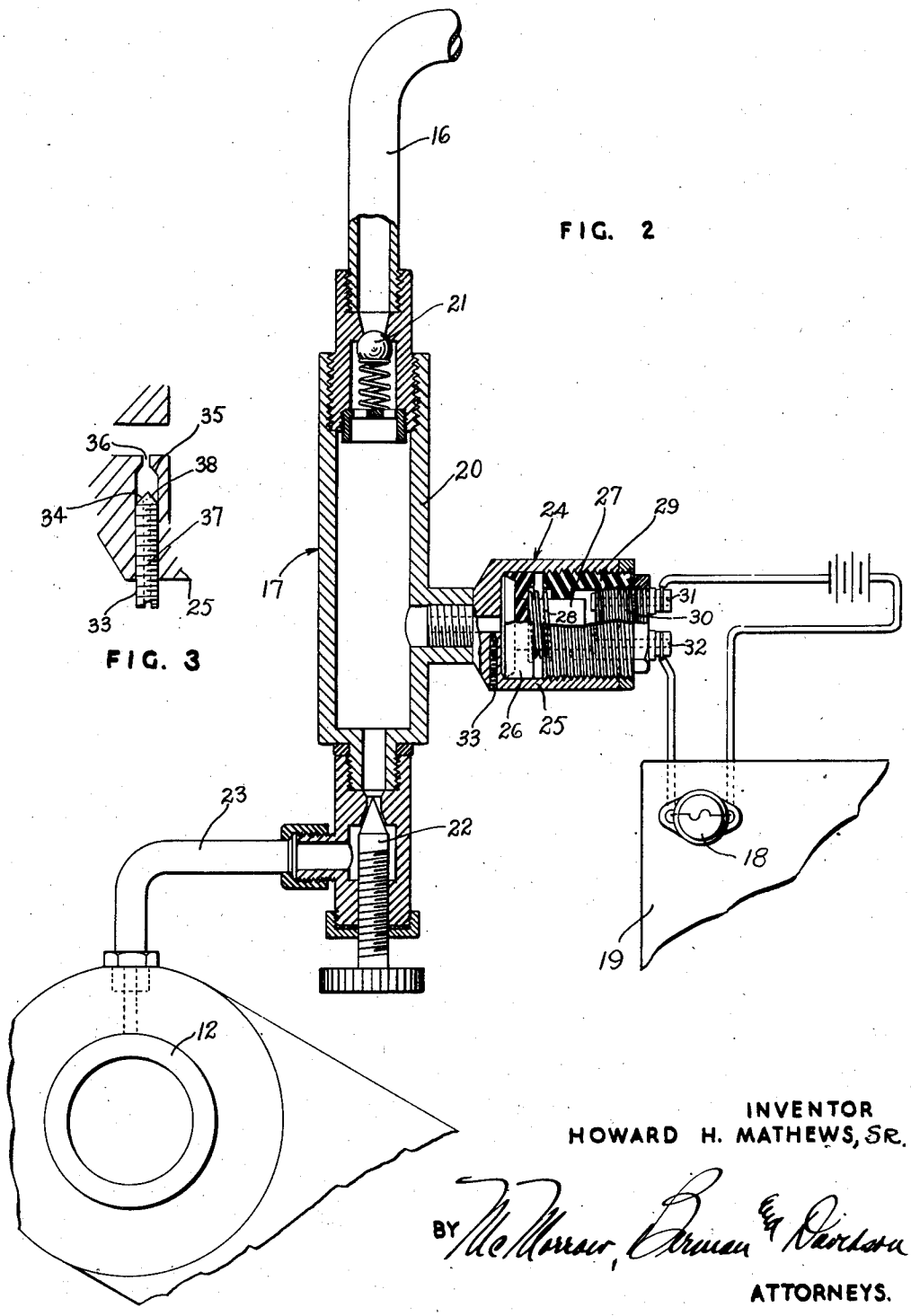


FIG. 2

FIG. 3

INVENTOR
HOWARD H. MATHEWS, SR.

BY McMorrow, Berman & Davidson

ATTORNEYS.

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LUBRICATION INDICATOR

Howard H. Mathews, Sr., Wood Ridge, N. J.

Application August 14, 1945, Serial No. 610,828

2 Claims. (Cl. 184—7)

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This invention relates to indicating devices, and more particularly to a device for indicating at a conveniently located panel the lubrication of a plurality of relatively inaccessible bearings such as the drying roll bearings of paper drying machines.

A main object of the invention is to provide a novel and improved remote lubrication indicator for lubricating systems of the pulsating type wherein the condition of the various elements of the system will be reflected by the visual indications given by lamps mounted on a conveniently located panel board.

A further object of the invention is to provide an improved lubrication indicator for lubrication systems of the pulsating type wherein a plurality of bearings are furnished with oil in timed pulses, the correct operation of the system being indicated by the periodic energization of signal lamps on a panel board, each signal lamp corresponding to one of the bearings being lubricated.

Further objects and advantages of the invention will appear from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a schematic view of a lubrication indicating system according to this invention as applied to a plurality of multi-roll paper drying machines.

Figure 2 is a detail view of a pulse responsive indicator element employed at each of the bearings of the machines of Figure 1.

Figure 3 is a detail view of a bleeder screw structure employed in the indicator element of Figure 2.

Referring to the drawings wherein the invention is applied by way of example to a plurality of multi-roll paper drying machines, 11 designates one of said machines, machine 11 having a plurality of vertically spaced horizontal rolls located on each side thereof, each roll having a bearing 12. The bearings 12 are lubricated by a conventional pulsating oil feed system comprising an oil pump 13 supplied from a suitable oil reservoir, an oil feed line 14, an oil header 15 for each machine and a branch line 16 extending to each bearing 12.

Interposed in each branch line 16 and located closely adjacent to its bearing 12 is a pulse responsive switch device 17, each switch device being connected in an electrial circuit including a signal lamp 18, the lamps 18 being mounted on a panel board 19 located at the base portion of the machine, and said lamps being arranged on the panel board in positions corresponding to the

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locations of the respective bearings 12 on the machine 11. The condition of lubrication of each bearing 12 may thus be readily perceived by observing the manner in which the signal lamps 18 on the panel board 19 are energized.

Each pulse responsive switch device 17 comprises a chamber 20 connected through a ball check valve 21 at its top end to the branch line 16 and connected at its bottom end through an adjustable needle valve 22 to a feed tube 23 leading to the bearing 12. Connected to chamber 20 is a pressure responsive switch 24 comprising a cylindrical housing 25 containing a plunger 26 carrying a bridging contact member 27. Plunger 26 is biased to a rearward open-circuit position by a spring 28 which bears between plunger 26 and a seat therefor formed in an insulating bushing member 29 threadedly engaged in housing 25. The normal compression on spring 28 may be regulated by adjusting bushing member 29.

Threadedly engaged with bushing member 29 is an insulating plug 30 carrying a pair of spaced terminals 31 and 32 whose inner head portions are positioned adjacent contact member 27 and are adapted to be bridged by said contact member when plunger 26 is forced forward by lubricating oil pressure. Terminals 31 and 32 are connected in series with the energizing circuit for signal lamp 18 corresponding to roller 12 on the panel board 19.

Provided in the rearward wall of housing 25 is an air bleeder screw 33 having a tapered end portion 34 adapted to seat on a conical valve surface 35 having an inlet port 36 connected therewith communicating with the oil inlet passage to cylinder housing 25. Screw 33 is formed with an axial bleeder passage 37 having an inclined top portion 38 which is sealed off when the tapered top end of screw 33 is seated against conical seat 35. When the screw is loosened, trapped air may be bled through passage 37 in the screw and may be thus released from the housing 25.

Ball check valve 21 is set so that it will open only at the pulse pressure, which is of the order of 150 pounds per square inch. The line pressure at other times in the cycle will be of the order of 25 pounds per square inch. When check valve 21 opens, oil is admitted into chamber 20 and from thence past needle valve 22 to bearing 12. Pressure is exerted on plunger 26 forcing said plunger forwardly and bridging terminals 31 and 32. Lamp 18 is thus energized simultaneously with the admission of the oil pulse to bearing 12.

Any abnormality of operation of the system

will be immediately reflected in the operation of the indicating lamp 18. Thus if the oil passage at needle valve 22 becomes clogged, pressure will be maintained in chamber 20 causing lamp 18 to be continuously energized. If check valve 21 becomes clogged there will be continuous low pressure in chamber 20 and lamp 18 will remain dark. Various other conditions of abnormality may be detected and analyzed by an experienced operator. Under normal conditions of operation all the lamps on panel board 19 flicker synchronously with the oil pulses. Since the lamps are positioned adjacent each other on panel board 19, defective lubrication at an individual bearing may be readily detected by the comparison of the corresponding signal lamp with the remaining lamps on the board.

Although a specific embodiment of a lubrication indicator system and specific structural details thereof have been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore it is intended that no limitations be placed on the invention other than as defined by the scope of the appended claims.

What is claimed is:

1. In a lubrication system of the pulse feed type for a machine having a plurality of individual bearings to be lubricated, an indicating system comprising a chamber for each bearing, said chamber being connected at one end to the oil feed line for said bearing and at the other end to the oil supply line to said bearing, a spring

biased check valve at said one end, a pressure responsive switch connected to said chamber and arranged to be closed synchronously with the building up of lubricant pressure in said chamber, and an electrical indicator device for each bearing, each said switch being connected in the energizing circuit for its electrical indicator device to energize the electrical indicator device only when the lubricant pressure in its associated chamber exceeds a predetermined valve.

2. The structure of claim 1, wherein the pressure-responsive switch comprises a cylinder open at one end to the chamber, a plunger reciprocable in said cylinder, an electrical contact at the other end of the cylinder, the said plunger being operable by oil pressure in the chamber to move against the contact to close the circuit to the electrical indicator device, means for normally urging the plunger to open-circuit position, and means for bleeding air between the plunger and the chamber end of the cylinder.

HOWARD H. MATHEWS, SR.

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